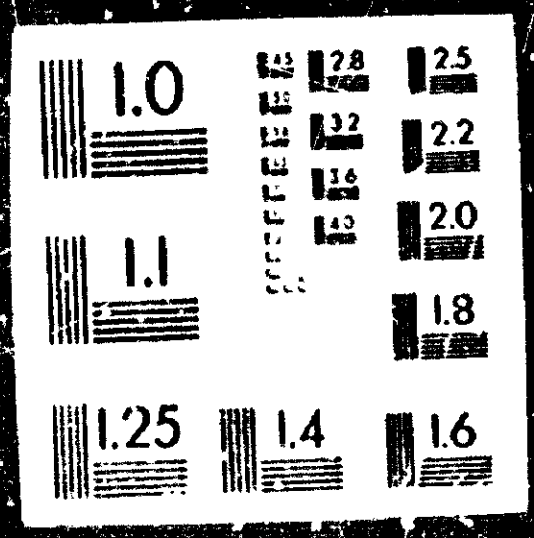
1 OF 5
PB 90
917 003



PB90-917003

Safety Study - Fatigue, Alcohol, Other Drugs, and Medical Factors in Fatal-to-the-Driver Heavy Truck Crashes. Volume 2

(U.S.) National Transportation Safety Board, Washington, DC

5 Feb 90

U.S. Department of Commerce
National Technical Information Service
NTIS

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

The National Transportation Safety Board is an independent Federal agency dedicated to promoting aviation, railroad, highway, marine, pipeline, and hazardous materials safety. Established in 1967, the agency is mandated by the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable cause of accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation.

The Safety Board makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews. Copies of these documents may be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. Details on available publications may be obtained by contacting:

National Transportation Safety Board
Public Inquiries Section, AD-46
800 Independence Avenue, S.W.
Washington, D.C. 20594
(202)382-6735

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. NTSB/SS-90/02	2. Government Accession No. PB90-917003	3. Recipient's Catalog No.
4. Title and Subtitle Safety Study: Fatigue, Alcohol, Other Drugs, and Medical Factors in Fatal-to-the-Driver Heavy Truck Crashes (Volume 2)		5. Report Date February 5, 1990 6. Performing Organization Code
7. Author(s)		8. Performing Organization Report No.
9. Performing Organization Name and Address National Transportation Safety Board Bureau of Safety Programs Washington, D.C. 20594		10. Work Unit No. 48621I 11. Contract or Grant No. 13. Type of Report and Period Covered Safety Study 1987-1988
12. Sponsoring Agency Name and Address NATIONAL TRANSPORTATION SAFETY BOARD Washington, D.C. 20594		14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

This report is an analysis of human factors involvement in fatal-to-the-driver, heavy truck accidents in eight States over a 1-year period, October 1, 1987 through September 30, 1988. Data presented are derived from in-depth investigation of 182 accidents which involved 186 heavy trucks and resulted in 207 fatalities. The accident investigations were conducted in California, Colorado, Georgia, Maryland, New Jersey, North Carolina, Tennessee, and Wisconsin. These accidents represent approximately 25 percent of this type of accident nationwide. Volume 1 (NTSB/SS-90/01) of the study includes an analysis of fatigue, alcohol, and other drug prevalence and medical factors in these accidents, presents findings, and makes recommendations to improve heavy truck safety. Volume 2 (NTSB/SS-90/02) contains the 182 case summaries that provided the data discussed in Volume 1.

17. Key Words heavy trucks; truck driver; fatal-to-the-driver; fatal truck accidents; substance abuse; alcohol, other drugs; drug testing; workplace; safety; blood alcohol concentration; toxicological testing, fatigue; hours of service; medical condition; medical qualification; cardiac screening; pre-employment screening		18. Distribution Statement This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161	
19. Security Classification (of this report) UNCLASSIFIED	20. Security Classification (of this page) UNCLASSIFIED	21. No. of Pages 459	22. Price A20

NTSB Form 1765.2 (Rev. 5/88)

EXECUTIVE SUMMARY

For many years, the National Transportation Safety Board has documented the major role played by alcohol and other drug abuse in causing accidents throughout the U.S. transportation system. The current study focuses on such abuse in accidents involving heavy trucks. The primary purpose in investigating fatal-to-the-driver heavy truck accidents was to assess the role that alcohol and other drugs played in these accidents.

For a one year period, October 1, 1987 through September 30, 1988, the Safety Board investigated every accident in eight States in which a driver of a heavy truck was fatally injured. One hundred and eighty two accident investigations involving 186 heavy trucks were conducted in California, Colorado, Georgia, Maryland, New Jersey, North Carolina, Tennessee and Wisconsin.

Fatal-to-the-driver heavy truck accidents in the eight States represent approximately 25 percent of this type of accident nationwide. While the Safety Board considers this a significant portion of the total fatal-to-the-driver accidents, it is not a random sample from the annual population of fatally injured truck drivers. However, because of the large sample size and methodology, the Safety Board believes that these accidents are representative of such truck accidents nationwide. The Safety Board does not suggest that fatal-to-the-driver heavy truck accidents are representative of all fatal truck accidents. The accidents are a census of fatal-to-the-driver heavy truck accidents in these States in the year of the study, and their number appears to be consistent with past years. The Safety Board cautions readers to avoid generalizing the results of the analysis of these fatal accidents to either all fatal truck accidents or all truck accidents.

From NTSB toxicological tests, the Safety Board found that 33 percent of the fatally injured drivers tested positive for alcohol and other drugs of abuse. The most prevalent drugs found were marijuana and alcohol (13 percent each), followed by cocaine (9 percent), methamphetamine/amphetamines (7 percent), other stimulants (8 percent), and codeine and phencyclidine (PCP) (less than 1 percent each). Stimulants are the most frequently identified drug class among fatally injured truck drivers.

Fatigue and fatigue-drug interactions were involved in more fatalities in this study than alcohol and other drugs of abuse alone.

In addition, the study found that for the fatally injured drivers:

- The most frequently cited accident probable cause was fatigue (57 drivers or 31 percent) followed by alcohol and other drug use impairment (53 drivers or 29 percent);

- Of the 57 drivers who were fatigued, 19 were also impaired by alcohol and/or other drugs;

- There is a strong association between violation of the Federal hours of service regulations and drug usage;

- Drivers with at least one suspended or revoked license are more likely than other fatally injured drivers to have used drugs of abuse;

- There is a significant relationship between a driver's prior alcohol and/or other drug offenses and a positive test for drugs of abuse in these accidents. This points up the need for thorough background checks and pre-employment drug tests;

- There is a significant relationship between drug positive test results among professional drivers and a shipment deadline for the load being carried;

- There is a significant relationship between drug positive test results and the type of trucking service provided, truckload (TL) vs. less-than-truckload (LTL). Nearly 42 percent of fatally injured TL carrier drivers tested positive compared with 14 percent of LTL carrier drivers;

- There is a significant relationship between drug positive test results and the day of the week. Saturday, Sunday, and Monday are the days with the highest percentages of drug positive tests;

- While time of day and drug positive tests are not significantly related, 70 percent of the drug positive tests occurred in the following times: 9:00-9:59 am; 1:00-3:59 pm; and 6:00 pm-1:59 am. 1988 FARS data indicates that 48 percent of truck fatal accidents occurred during these times;

- A disproportionately high percentage of drivers who used drugs are single, separated or divorced;

- The driver's medical condition caused or contributed to 10 percent of the accidents. Over 90 percent of medical condition related accidents involved some form of cardiac incident. This calls into question the effectiveness of the Federal program to assure the proper medical qualification of commercial vehicle drivers;

- Older drivers are less likely to have tested positive for drugs, but are more likely to have had an incapacitating medical incident;

- Occupant protection issues are the most frequently identified non-causal factors involved in a heavy truck fatal accident (68 of 185); and

- In 115 of the 185 accident involved trucks (62 percent), some management deficiency in oversight of the driver or the proper condition of the vehicle was identified. Deficiencies in oversight of both the driver and the vehicle were identified in 32 of 185 (18 percent) accidents.

The study also reviews: the regulations and legislation governing commercial truck operations; previous relevant research in the field of alcohol and other drug abuse; and the highway accident databases now in existence. The study notes the limitations of those databases as a means with which to assess the scope of the alcohol and other drug abuse problem in heavy truck accidents.

The Safety Board noted that there is also the need for a standardized national set of procedures for conducting alcohol and other drug tests when a fatal heavy truck accident takes place.

As a result of this safety study, recommendations have been issued to: the Department of Transportation, the National Highway Traffic Safety Administration, the Federal Highway Administration, the Department of Health and Human Services, Governors of the States, the National Governors Association, trucking industry trade associations, the International Brotherhood of Teamsters, law enforcement associations, the National Home Study Council, the National Association of Trade and Technical Schools, and the Professional Truck Driver Institute of America. Recommendations include:

- Review of industry structure, operations, and conditions which may create incentives for drivers to violate hours of service regulations and to use drugs of abuse;

- Establishment of a program to merge different truck databases into a national commercial truck database to provide information on fatal truck accidents and trucking operations;

- Establishment of a program to standardize postaccident toxicological specimen collection, testing, and reporting for truck accidents;

- Revision of the Fatal Accident Reporting System to include standard drug toxicological test results;

- Improvement of regulations to establish hours of service violations, logbook irregularities, multiple logbooks, and a commercial vehicle operation alcohol offense as a reasonable cause requiring a drug test of the driver;

- Improvement of pre-employment drug and alcohol screening including frequent, unannounced drug testing, for an appropriate period, of drivers with an identified alcohol or other drug abuse problem;

- Improvement of medical screening and disqualification standards;

- Requirements for automated devices to identify commercial drivers who exceed hours of service regulations;

- Establishment of fatigue, alcohol and other drug education campaigns oriented toward commercial drivers;

- Improvement of drug recognition capabilities among law enforcement and other personnel with commercial truck driver oversight responsibilities;

- Development of programs to conduct selective alcohol and other drug enforcement actions including a roadside drug testing demonstration at truck inspection lanes, weigh stations, and/or sobriety checkpoints; and,

- Enactment of State legislation to: establish 0.01 blood alcohol concentration (BAC) as the per se offense level for commercial vehicle operators; require collection of blood samples for toxicological testing of all operators in fatal commercial truck accidents; require employers to perform pre-employment drug tests for all commercial truck drivers, to review applicants' prior history, and to require frequent, unannounced testing, for an appropriate period of drivers with an identified alcohol or other drug abuse problem.

PROBABLE CAUSE TABLES

The tables on the following pages summarize the probable cause of each accident in this study. Column abbreviations have the following meanings:

- "Prof" is the column for a professional driver which is indicated by the letters "Pr".
- "Phys Incap" means the driver was physically incapacitated by a health problem.
- "Imprmt Fatigue" means the driver was impaired by fatigue.
- "Imprmt Alcohol" means the driver was impaired by alcohol.
- "Imprmt Drugs" means the driver was impaired by drugs other than alcohol.
- "Drivr Inexper" means the driver's inexperience was causal.
- "Unsaf Mvmnt" means that the accident was caused by the driver's unsafe movement.
- "Disregrd Wrngs or Signs" means that the accident was caused by the driver's disregard of warnings or advisory signs.
- "Misjudge Safe Speed" means that the driver misjudged the safe operating speed for his vehicle for the roadway and conditions present.
- "Faild to Yield Percv Obsrv" means that the driver failed to see or perceive a potentially dangerous situation and/or failed to yield to other traffic in such a situation.
- "Occup Prot" means that a lack of vehicle integrity, safety belts, or safety belt use contributed to the driver's death or severity of injuries.
- "Conspicuity" means that a lack of vehicle visibility or conspicuity was a cause of the accident.
- "Brake adj/deficient" means that some form of braking problem was causal in the accident.
- "Mech/maint" means that a mechanical failure or lack of vehicle maintenance was causal in the accident.
- "Signs/rdway/envir" means that factors such as inadequate or improper signage, roadway factors such as skid coefficient, or environmental factors such as fog, smoke, rain, or snow were causal.

- "Load/load shift C.G." means that the vehicle's load was improperly secured, shifted during transport, or was loaded on a high center of gravity vehicle which required special driving precautions.

- Finally, in some cases, the failure could not be documented and was included in the "Failure unknw reasn" category.

Three abbreviations included in the rows of this table are:

- "Pr" indicates a professional driver,

- "C" refers to the case driver (fatally injured truck driver)

- "NC" refers to the driver of a non-case vehicle (any vehicle which is not a medium or heavy truck.

Figure 1.--Probable cause matrix

CASE	PROF	PHYS INCAP	IM-PRMT FA-TIGUE	IM-PRMT AL-COHOL	IM-PRMT DRUGS	DRIVR IN-EXPER	UNSAF MVMNT	DIS REGRD WRNGS OR SIGNS	MIS-JUDGE SAFE SPEED	FAILD TO YIELD PERCV OBSRV	OCCUP PROT	CNSPI CUITY	BRAKE ADJ/ DEFI-CIENT	MECH/ MAINT	SIGNS RDWAY ENVIR	LOAD/ LOAD SHIFT C.G.	FAIL-URE UNKNW REASN
001	Pr						C										
002	Pr	C															
003	Pr								C								
004	Pr							C	C		C						
005	Pr		C		C	C											
006	Pr		C								C	C					
007				C													
008	Pr		C								C		C				
009	Pr	C															NC
010																	
011	Pr						C				C						
012	Pr				C												
013	Pr				C												
014	Pr									NC	C						
015										C	C						
016	Pr								C		C			C	C		
017	Pr			NC	NC						C						
018	Pr				C								C				
019	Pr		C		C												
020	Pr		C						C		C						
021	Pr				C						C						
022	Pr		C								C						
023	Pr		C										C				
024	Pr					C			C								
025		C															
026					C				C						C		
027	Pr		C														
028	Pr		C		C												
029	Pr						C								C		
030	Pr									C					C		
031	Pr	C	C								C						
032	Pr				C						C	C					
033	Pr								C		C					C	
034	Pr		NC														
035														NC			
036		C															
037	Pr								C		C				C		
038	Pr			C													
039	Pr						NC				C						
040	Pr									C					C		
041	Pr		C	C													
042	Pr								C						C		
043	Pr			C	C						C						
044			C														
045									C						C		
046	Pr								C		C				C		
047	Pr		C		C												
048	Pr										C		C	C			
049	Pr	C	C									C					
050	Pr										C				C		
051	Pr	C															
052	Pr		C		C										C		
053	Pr		C														
054			C			C					C						
055	Pr									C		C					
056	Pr	C															
057	Pr		C								C			C			
058					C	C											
059	Pr	NC								NC	C						
060						C					C		C	C			
061					C												
062	Pr		C														

CASE	PROF	PHYS INCAP	IM-PRMT FA-TIGUE	IM-PRMT AL-COHOL	IM-PRMT DRUGS	DRIVR IN-EXPER	UNSAF MVMNT	DIS REGRD WRNGS OR SIGNS	MIS-JUDGE SAFE SPEED	FAILD TO YIELD PERCV OBSRV	OCCUP PROT	CNSPI CUITY	BRAKE ADJ/ DEFI-CIENT	MECH/ MAINT	SIGNS RDWAY ENVIR	LOAD/ LOAD SHIFT C.G.	FAIL-URE UNKNW REASN
063			C														
064	Pr										C				C		
065	Pr				C								C				
066	Pr		C														
067	Pr		C								C						
068	Pr	C															
069	Pr		C								C						
070	Pr		C		C						C				C		
071	Pr						NC				C				C		
072	Pr						C				C				C		
073	Pr								C		C						
074	Pr	C															
075	Pr				C												
076	Pr								C		C					C	
077	Pr		C														
078	Pr			C								C					
079	Pr		C														
080	Pr		C		C						C						
081	Pr						C										
082	Pr				C						C						
083												C				C	
084	Pr		C		C						C						
085	Pr		C														
086	Pr								C						C		
087	Pr				C												
088	Pr					C			C								
089	Pr				NC		NC				C						
090														C			
091	Pr									C							
092	Pr			C	C									C	C		
093	Pr	C															
094	Pr							C									
095	Pr					C			C		C						
096	Pr		C														
097	Pr		C														
098	Pr		C		C							C					
099	Pr		C		C												
100	Pr		C								C						
101	Pr												C	C			
102	Pr		C									C					
103	Pr	C	C														
104	Pr			NC													
105	Pr		C	C						NC	C						
106	Pr		C				NC										
107	Pr	C															
108	Pr		C								C						
109			C		C												
110	Pr		C		C						C						
112	Pr		C			C			C		C						
113	Pr		C	C	C												
114	Pr			C	C						C						
115	Pr													C			
116	Pr		C														
117A	Pr		C														
117B	Pr		C														
118	Pr		C						C								
119					C												
120	Pr													C			
121	Pr						NC										
122											C		C	C			
123	Pr		C								C						
124	Pr				C						C						

CASE	PROF	PHYS INCAP	IMPRMT FATIGUE	IMPRMT ALCOHOL	IMPRMT DRUGS	DRIVR INEXPER	UNSAF MVMNT	DISREGRD WRNGS OR SIGNS	MISJUDGE SAFE SPEED	FAILD TO YIELD PERCV OBSRV	OCCUP PROT	CNSPICUITY	BRAKE ADJ/ DEFICIENT	MECH/ MAINT	SIGNS RDWAY ENVIR	LOAD/ LOAD SHIFT C.G	FAILURE UNKNW REASN
125																	C
126A	Pr						C		C								
126B	Pr						C		C								
127				C							C						
128	Pr			C													
129	Pr								C		C					C	
130	Pr			C	C						C						
131	Pr						C										
132	Pr			C							C			C			
133	Pr										C						C
134	Pr		C							C							
135	Pr	C															
136	Pr							C			C		NC				
137										C							
138	Pr			C							C						
139	Pr			C	C												
140															C		
141A	Pr									C							
141B	Pr									C							
142	Pr									C	C					C	
143	Pr							C			C						
144	Pr								C						C		
145	Pr		C						C		C						
146				C	C						C						
147	Pr	C															
148	Pr			C													
149	Pr						C				C						
150	Pr		C		C						C						
151		C															
152	Pr		C				NC										
153				C													
154	Pr	C															
155	Pr				C			C									
156A	Pr																C
156B	Pr																C
157	Pr									C		C					
158							NC										
159	Pr		C		C												
160			NC						NC								
161	Pr								C								
162	Pr		C	C							C						
163											NC						
164	Pr				C												
165				C							C						
166	Pr		C								C						
167			C							C							C
168	Pr																
169	Pr									NC	C						
170	Pr		C								C				C		
171	Pr											NC					
172	Pr						NC								NC		
173	Pr						C				C						
174		C															
175	Pr								C		C				C		
176	Pr			C							C						
177	Pr									C							
178	Pr									NC	C						
179		C			C												
180						C											
181	Pr			C	C										C		
182	Pr						C										

CASE NO.: 1

Investigation No.: LAX-88-H-TR01
Accident Location: I-710 at I-10, Monterey Park, California
Lanes: 4 lanes divided
Shoulders: Right shoulder - 8 feet of asphalt surface
Median: None
Features: Straight, level, elevated
Date and Time: October 2, 1987, 3 p.m.
Ambient Conditions: Clear, 70° F, daylight, and dry
Heavy Truck Involved: 1980 COE Kenworth tractor in combination with a empty 50-foot flatbed trailer
Motor Carrier: Boise Cascade Corporation
Type of Operation: Private Carrier
Size of Operation: Approximately 600 power units
Total Weight of Truck: 25,330 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 1983 Chevrolet Malibu 4-door
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The empty combination vehicle was traveling at a witness estimated speed of 45 - 55 mph, returning from delivering a load of corrugated containers to Alhambra, California. As the truck unit approached I-10, witnesses observed other traffic enter southbound I-710 from the westbound I-10 -southbound I-710 connector road. The truck moved from the #2 lane into the #1 lane and collided with a 1983 Chevrolet Malibu that was positioned alongside the left door of the truck. The automobile and the truck veered left, striking and destroying approximately 69 feet of a 3-foot-high steel bridge railing retaining fence. The combination vehicle fell approximately 50 feet onto the I-10 freeway surface below. The automobile fell approximately 45 feet before it rolled over and stopped on the dirt embankment located north of the westbound lanes of I-10 at I-710. Postcrash inspection of the combination unit revealed no mechanical defects that would have contributed to the cause of this accident.

The tractor sustained major damage to the cab, frame, engine, drive line, and suspension system. The trailer was moderately damaged; most of which was confined to the frame. The truckdriver was ejected and sustained fatal injuries. Examination of the restraint system revealed that the lap belt was fully retracted into the spool assembly. The automobile sustained substantial damage to its roof, sides, rear, and under carriage; however, the front end sustained the majority of the direct impact damage. The driver, found belted at the driver's position, sustained minor to moderate lacerations and bruises. There were no other occupants in either vehicle.

The 59-year-old truckdriver held a valid California Class 1 operator's license restricted to wearing corrective lenses and authorizing driving combinations. He also held a valid Medical Examiner's Certificate issued on

Monterey Park, California
Case No. 1

July 6, 1987. His California driving record from 1984-1987 showed one accident, one violation for driving on a divided section of the highway, and an overweight violation. According to the driver's wife, he had between 25 30 years of experience as a truckdriver and had learned the business on the job. Additionally, he had worked for the carrier for over 15 years. The truckdriver qualification file maintained by the carrier contained an application for employment dated April 25, 1967. The driver was well thought of by the carrier and described as a stable employee.

Blood samples were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were found.

Blood samples were also screened at the request of the Los Angeles Medical Examiner with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the truckdriver's unsafe movement into the left lane which probably reflected his failure to observe the passenger car.

CASE NO: 2

Investigation No.: LAX-88-H-TR02
Accident Location: State Route 99, Fresno, California
Lanes: Single lane offramp to Manning Avenue
Shoulders: Varying width dirt on left,
5 foot asphalt on right
Median: None
Features: Level, elevated, right curve
Date and Time: October 5, 1987, 5:40 p.m.
Ambient Conditions: Daylight, clear, dry
Heavy Truck Involved: 1977 COE Kenworth tractor in combination with a loaded flatbed trailer
Motor Carrier: Eaton-Ansell, Inc.
Size of Operation: One tractor
Total Weight of Truck: 70,565 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None

Truck Fatalities:	1	Truck Injuries:	0
Other Fatalities:	0	Other Injuries:	0

FACTUAL SUMMARY:

The combination unit was traveling north when it began to exit the freeway at a right curving offramp. The vehicle drifted off the right road edge, traveled approximately 480 feet along the depressed right shoulder, and impacted a dirt embankment at the north end of the shoulder. There was no evidence of evasive maneuvers and there were no other vehicles involved.

The impact caused moderate undercarriage damage. The unrestrained driver sustained only minor abrasions in the collision. He succumbed to "acute cardiac failure due to arteriosclerotic coronary insufficiency." An autopsy revealed an enlarged heart with moderate arteriosclerosis and a healed myocardial infarction.

Although medical records could not be found during a postcrash examination, the coroner's investigator was advised that the driver had previously visited the hospital for heart problems, diagnosed in 1980 as single right coronary artery with high grade lesion and proximal left ventricle branch.

Due to the fact that this driver was an owner/operator, there were no carrier records regarding past physical examinations. The driver's relatives refused all cooperation. No records of any physical examination were retained by the California Department of Motor Vehicles. The broker with whom the driver was associated maintained neither vehicle maintenance nor driver information files, and was unable to provide any training or experience data. The driver's California record indicated 5 prior moving violations and one accident in the past 3 years; all occurred while driving the accident vehicle.

Fresno, California
Case No. 2

At the time of the accident, the driver was expected to be enroute to the broker. The accident scene would not have been the appropriate location to exit the freeway to reach either the broker's location or the driver's nearby residence.

Although the lease agreement between the broker and the driver listed the broker as the prime carrier and relieved the prime carrier of any responsibility for either the vehicle or the driver, it was approved by the State Public Utilities Commission.

Blood samples were sent the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were found.

Blood samples were also analyzed by Pathological and Clinical Services of Fresno, California. This analysis indicated a BAC of 0.02 percent.

The California laboratory reported a blood alcohol of 0.02 percent while the Center for Human Toxicology did not find ethanol. A BAC of 0.02 percent is likely to be a background in the measurement or could be sample deterioration. However, this difference between the two measurements is not considered significant.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 3

Investigation No.: ATL-88-H-TR01
Accident Location: U. S. 70, New Bern, North Carolina
Lanes: 4-lane divided
Shoulders: Both shoulders asphalt paved, left - 4 feet 2 inches wide, right - 4 feet 7 inches wide
Median: 61-feet-wide swaled grassed median
Features: Straight and level
Date and Time: October 6, 1987, 8:05 a.m.
Ambient Conditions: Daylight, smoke bank, dry pavement
Heavy Truck Involvement: 1984 conventional 3-axle GMC in combination with a loaded 45-foot open top trailer
Motor Carrier: Wooten Poultry, Inc.
Type of Operation: Private and Contract Carrier
Size of Operation: 2 trucks and 2 tractors
Total Weight of Truck: Approximately 60,000 pounds
Total length of Truck: 57 feet
Other Vehicle involved: Tractor/trailer unit, 1 pickup truck and 3 automobiles

Truck Fatalities:	1	Truck Injuries:	0
Other Fatalities:	0	Other Injuries:	1

FACTUAL SUMMARY:

A quarter-mile-long smoke bank suddenly developed near the middle of a 5-mile-long tangent, level, roadway section that traversed low-lying woodlands. The weather was clear and visibility was unrestricted on the roadway except at the smoke area where it was near zero for about one hour. During the reduced visibility condition, five separate accidents involving 15 vehicles occurred in the smoke bank on the westbound roadway and one involving two vehicles occurred on the eastbound roadway. One of the accidents in the westbound roadway involving the subject combination vehicle, 5 other vehicles, and 10 occupants, is reported herein.

Moments prior to this accident, six westbound vehicles passed through the smoke bank and became involved in two separate rear-end-type collisions. Debris from those accidents was scattered on the traffic lanes when these vehicles arrived.

Drivers of a westbound pickup truck and a Lincoln automobile entered the smoke area, saw the debris on the pavement, and stopped their vehicles near the right pavement edge. Two westbound automobile drivers drove into the smoke and stopped their vehicles near the left pavement edge ahead of the pickup truck and Lincoln. Shortly after those vehicles stopped a empty westbound Coca Cola tractor semitrailer unit, followed by a tractor semitrailer unit loaded with wood chips, entered the smoke bank. On sighting the vehicles stopped in the right lane the Coca Cola truckdriver began braking his truck and was struck from the rear by the wood chip truck. With the wood chip tractor engaged at the rear of the Coca Cola trailer, the two units continued moving forward for about 200 feet and colliding with the four stopped vehicles. The combination units came to rest upright, intact and

still engaged, blocking both westbound traffic lanes. The wood chip unit was facing southwesterly at an angle across the left traffic lane; the rear of the Coca Cola trailer was in contact with the front of the wood chip tractor and extended northwesterly across the right traffic lane with its tractor resting astride the north pavement edge. There was no fire or explosion.

The Coca Cola tractor sustained moderate damage, the wood chip tractor was destroyed; both trailers sustained major damage. The Coca Cola driver was not injured; the wood chip driver was killed. The other four vehicles were substantially damaged; only one of those occupants were injured.

The Coca Cola driver had passed the wood chip truck about 2 1/2 miles prior to the accident site; he estimated the wood chip truck's speed at that time to be between 40 to 45 mph. The wood chip driver indicated that he was alert by waving his hand at the passing Coca Cola driver. The Coca Cola driver continued ahead of the trailing truck and was about one-half mile away when he first noted smoke over the roadway at the accident location. He was traveling at an estimate speed of between 50 and 55 mph. At the time, he perceived the smoke to be "light," and drove into it without slowing his unit. On entering the smoke bank his visibility was reduced to almost zero. He immediately saw an "outline" of the stopped vehicles, and then began braking his unit.

The wood chip truck was owned and operated by a corporate turkey-farm operator. The corporation's accident involved truck was one of two tractor semitrailer units that operated in intrastate commerce transporting wood chips from a mill at New Bern to its farms (as a private motor carrier) plus to other farm operators (as a contract carrier) in eastern North Carolina. Its trucking operation was subject to the FMCSR adopted by North Carolina. The accident truck was loaded in New Bern less than an hour before the accident and was enroute to Rose Hill, North Carolina, about 90 miles away. There was no evidence that the truck experienced a mechanical defect that would have been a factor in the accident.

The 57-year-old wood chip truck driver had worked for the motor carrier since he was 7 years old. He first worked as a laborer and later began driving small farm trucks. He had received no formal truckdriver training but had driven tractor semitrailer units for the past 20 years. He held a valid non restricted Type A North Carolina driver's license authorizing him to drive combination units. A check of his North Carolina record revealed no prior traffic violation or accident history. Except for a valid Medical Certificate, the motor carrier had no Driver Qualification File on the driver as required by the FMCSR. Neither was the motor carrier following a systematic inspection and maintenance program on its trucks as required by the same regulations.

He had been on duty approximately 52 hours during the 7-day period preceding the accident and had driven less than 2 hours following 8 consecutive hours off duty.

New Bern, North Carolina
Case No. 3

Vitreous samples from the fatally injured truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the test sample was not of sufficient quantity to test for BENZOS, stimulants, or anticonvulsants.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed upon entering an area of dense smoke.

CASE NO.: 1

Investigation No.: MKC-88-H-TR01
Accident Location: Interstate 40 at Christmasville Road, Jackson, Tennessee
Lanes: One
Median: None
Features: 2 percent downgrade with a curve to the left
Date and Time: October 8, 1987, 9:30 a.m.
Ambient Conditions: Clear, roadway dry, daylight
Heavy Truck Involved: 1986 conventional International tractor in combination with a loaded 45-foot van trailer
Motor Carrier: A. O. Smith
Type of Operation: Private Carrier
Size of Operation: 9 power units
Total Weight of Truck: 74,270 pounds
Total Length of Truck: 63 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 1
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was channelized off the interstate onto an exit ramp across Christmasville Road onto the entrance ramp leading back to the interstate. As the combination unit traveled down the entrance ramp, at a witnessed speed of about 50 mph, the ramp curved to the left, and the trailer rolled over onto the guardrail. As the trailer slid down the guard rail, it pulled the tractor over on its side. The combination unit slid down the guardrail and rolled 180° before it came to rest upside down.

This accident resulted in substantial damage to the tractor and trailer. The unrestrained driver was ejected and was found fatally injured on the ground beside the power unit wreckage. The codriver was found pinned within the sleeper with minor injuries.

The driver had been employed by the motor carrier since March 9, 1970, but not as a driver. He took a leave of absence from work from July 24, 1984, until August 17, 1984, to attend a commercial vehicle operators school. The company transferred him to their truck driving division on January 30, 1985.

The driver's application for employment revealed that he had no right ear drum. However, when the driver received his examination from the company doctor to determine physical qualification, the doctor indicated that he had normal hearing in both ears. The certification of road test in the drivers file did not have the driver's name on it. It neither told when the road test took place nor how many miles the driver drove.

The speed limit on I-40 leading up to the construction zone was 65 mph, but there were advisory speed signs recommending from 55 mph down to 35 mph in 10 mph increments. According to the original construction plans, the entrance ramp curve was designed for speeds of 40 mph.

Jackson, Tennessee
Case No. 4

Travelling west on I-40 from Huntington road overpass there was a construction sign that states that the "Left Lane Closed One Mile". The following sign was "Speed Limit 65 mph." The next sign told the drivers that the left lane was closed in 1/2 mile. The fourth sign stated that the left lane was closed in 1500 feet. The next sign warned drivers that the left lane closed in 1000 feet--there was a 55 mph advisory speed sign attached to the same post. The following sign warned that there was road construction in 1500 feet. Going on west, the next sign was a picture of a road with the left lane going into the right lane, and a 45 mph advisory speed sign was attached to that same post The next sign warned "Road Construction 1000 feet", and the following sign was "Road Construction 500 feet". The last sign was a "Detour 500 feet" sign with a 35 mph advisory speed sign attached to the post. There were no other signs on the exit or entrance ramp.

The drivers daily logs indicated that he had driven only 3 hours and 15 minutes in the last 24 hours. In the last three days the driver had been on duty for 17 hours and 45 minutes.

Blood samples were sent to the Center for Human Toxicology at the University of Utah for screening , confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained salicylate (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were not conducted by the State of Tennessee.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for the roadway curvature and his apparent disregard of existing advisory speed signs. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 5

Investigation No.: DEN-88-H-TR01
Accident Location: U.S. Highway 160, 16 miles east of Pagosa Springs, Colorado
Lanes: 2
Shoulders: Right 4-foot dirt. Left 9-foot dirt
Both shoulders were dry and hard packed
Median: None
Features: Winding, steep 7 percent downgrade
Date and Time: October 9, 1987, at 3:52 a.m.
Ambient Conditions: Clear, dark
Heavy Truck Involved: 1987 Peterbilt tractor in combination with a loaded 48-foot trailer
Motor Carrier: Day's Express, Inc.
Type of Operation: Common Carrier
Size of Operation: 208 power units
Total Weight of Truck: 80,120 pounds
Total Length of Truck: 67 feet
Other Vehicle Involved: None
Truck Fatalities: 2 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was descending the west side of the mountain from Wolf Creek Pass. Five miles downgrade from the pass, in an area with a 7 percent downgrade, the truck rolled over onto its right side on a left horse-shoe turn with a radius of 197 feet. The truck left 277 feet 6 inches of yaw marks before rolling over. It then slid approximately 150 feet on the pavement and struck a metal "W-beam," guardrail destroying 152 feet of the railing. The truck then flew through the air for approximately 40 feet, struck the mountainside, and slid 350 feet down the steep mountain before becoming lodged in some crevasses. The tractor and the front half of the trailer frame remained attached, via the fifth wheel, and the unit came to rest on its right side with the tractor pointing down the mountain. The back half of the trailer frame continued down the mountain and came to rest at the bottom of the 1,360-foot steep dropoff. The trailer's roof and sides were torn into small pieces and scattered over the mountain side. Using tiremarks and other physical evidence documented at the scene, police officers estimated the units speed to be about 69 mph at the time of the accident. The truckdriver failed to utilize either of the two runaway truck ramps that were available to him during his descent of the mountain roadway. The last escape ramp passed was less than 2/10 mile before the accident location.

Both the driver and codriver were fatally injured. Physical evidence indicated that the codriver jumped from the truck prior to it rolling over onto its right side. The codriver was found along side the roadway next to a metal I-beam guardrail post. The driver went with the truck over the mountain side, was ejected, and was found on top of the produce cargo about ten feet away from the tractor. An inspection of the seat belts showed no signs of loading or stretch marks.

Pagosa Springs, Colorado
Case No. 5

At the time of the accident the driver had been on duty and/or driving for 19 hours without rest or sleep. Interviews were conducted with four people who had contact with the driver during this 19 hour period. All stated that the driver talked about being afraid of mountain driving as he had never driven a truck in the Colorado mountains before. The four individuals stated that when discussing the best route to Phoenix, Arizona, they told the driver to stay on the interstate highways and avoid the Durango, Colorado route which had Wolf Creek Pass and mountain two lane traffic roads. Carrier officials stated that the driver was off the interstate route that they had assigned. NTSB calculations estimated the truck's speed at approximately 81 mph when the truck rolled over and started sliding, and approximately 68 mph when the truck left the roadway after destroying the metal guard rail.

Examination of the vehicle revealed that the tractor had been in service for five months and had accumulated 108,450 miles. Tires, and steering parts were in excellent shape. Push-rod travel on the #2 axle left side and both brakes on the #3 axle exceeded the allowable limits of 2 inches. All of the brake drums showed signs of heat cracks and discoloration. The 9-speed Fuller manual transmission was in 7th gear on the high range, and the two-way high/low shift button on the shifting lever was in the high position. The diesel engine was equipped with a 3-stage engine retarder--the control switch in the cab showed all three stages were engaged.

An investigation into the truckdriver's employment history revealed that he had been a truckdriver since April 15, 1987, after completing Superior's Advanced Tractor/Trailer Driver's course in Indianapolis, Indiana. Due to his high grades, he was hired by Day's Express Inc. immediately upon graduating. Prior to this the driver had no truckdriving experience.

The Indiana Motor Vehicle Department records showed the driver's driving privileges had been suspended on April 12, 1985, for "failure to appear" on a speeding citation. The suspension was aggravated when the driver was charged on November 5, 1985, for driving while under suspension. On January 4, 1986, the speeding citation was paid and the suspension was cancelled. Additional listings included two speeding citations from 1984 to 1987. Due to the number of points compiled against the license and past driving record, the Motor Vehicle Department had scheduled a suspension hearing with the driver for the last week in November 1987. The National Driver's Register (NDR) had the 1986 suspension listed on their records.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood contained 200 ng/ml of cocaine, 130 ng/ml of benzoylecognine (metabolite of cocaine), 3 ng/ml of the psychoactive component of marijuana (THC), and 25 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Pagosa Springs, Colorado
Case No. 5

In addition, a syringe found in the truckdriver's suitcase was also sent to the CHT for drug identification. The CHT analysis found that the syringe contained cocaine residue.

Toxicological tests of the truckdriver's blood conducted by the State of Colorado Health Department were negative for alcohol. However, the Colorado laboratory did not do a drug screen on the blood sample.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue and his use of cocaine and marijuana. Contributing to the accident was the driver's inexperience with mountain roadways.

CASE NO.: 6

Investigation No.: ATL-88-H-TR02
Accident Location: Interstate 95, 11.4 miles south of Midway, Georgia
Lanes: 4 lane divided
Shoulders: Asphalt; 1-foot left, 10-feet right
Median: Grass, depressed, 64-feet wide
Features: At grade, level
Date and Time: October 10, 1987, 11:15 p.m.
Ambient Conditions: Clear and dark
Heavy Truck Involved: 1981 Kenworth tractor in combination with a trailer loaded with 700 pounds of cargo
Motor Carrier: David Jones Seafood, Inc.
Type of Operation: Common carrier
Size of Operation: 7 tractors and 3 trucks
Total Weight of Truck: 28,200 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: 1986 Freightliner tractor with loaded flatbed trailer
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

Both combination units were traveling south in the right traffic lane of Interstate 95. The right front of the Kenworth tractor struck the left rear of the preceding combination unit. About the time of initial impact, the Kenworth driver braked and steered evasively to the left. After impact, the Kenworth combination unit moved leftward across the roadway, crashed through a metal guardrail, and overturned onto its left side in the center median.

The Kenworth tractor was extensively damaged and there was considerable intrusion into the driver position of the cab. The driver was entrapped in the cab and killed. The Freightliner combination unit stopped on the right shoulder with minor damage only to the rear left of the trailer. The Freightliner driver was not injured.

At the location of initial impact of the two vehicles in the right traffic lane, the preceding Freightliner combination unit was moving from the right traffic lane onto the right shoulder. The driver of the Freightliner tractor stated that he observed the trailing vehicle approaching from his rear and that it was in the right traffic lane and traveling at a much greater speed than his own vehicle. The Freightliner driver began to steer evasively onto the right shoulder in an effort to avoid the approaching vehicle. He related that he did not think he braked in a manner that would have resulted in any skidmark being left on the highway. However, a right side dual wheel skidmark of the semitrailer extended from the right traffic lane onto the right shoulder.

A 50-state check revealed that the Kenworth driver had been licensed in both Tennessee and Florida for several years. The records revealed a history of several convictions, particularly for speeding, in both States. His

license had been revoked by Florida on June 16, 1986, for "habitual traffic violator." Also, the records revealed that on two occasions he had made application and been issued a license by Tennessee while his license was revoked in Florida. In both cases he signed applications verifying that his driving privilege was not revoked in any other State. The records further revealed that on one occasion he turned in a Tennessee license and was licensed by Florida. Subsequently, he made application to Tennessee and was issued a duplicate for lost license.

The motor carrier maintained no driver qualification file for the Kenworth driver. Neither did the motor carrier demonstrate any particular effort toward oversight of its drivers on hours of service. No daily log prepared by the accident truckdriver was found, nor could the motor carrier produce any logs. Reconstruction of the most recent hours of service for the truckdriver was accomplished in large part by obtaining information on miles traveled from a company that handles fuel permit matters for the motor carrier. The data suggested hours of service violations, but evidence of specific violations could not be documented. The motor carrier stated that the truckdriver was in Boston the evening prior to the day of the accident. The exact time was not determined and may have been more than 24 hours before the accident. Assuming that the driver departed Boston at 6 p.m., it was computed that he drove over 1,100 miles in less than 30 hours prior to the accident. He stopped at the motor carrier's facility and his vehicle was serviced along the way.

Vitreous samples from the Kenworth driver were sent to the Center for Human Toxicology at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for marijuana, anti-convulsants, and analgesics.

Toxicological tests were not conducted by the State of Georgia because their entire sample was released to the NTSB.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the Kenworth driver due to fatigue. Contributing to the accident was the poor conspicuity of the flatbed trailer. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 7

Investigation No.: SEA-88-H-YR01
Accident Location: County Road G15, Greenfield, California
Lanes: 2
Shoulders: Right, 3-6 feee wide, dirt - Left, variable width, sloping downhill, dirt
Median: None
Features: Curves, 4 percent downgrade
Date and Time: October 12, 1987 10:35 a.m.
Ambient Conditions: Light fog, daylight, dry,
Heavy Truck Involved: Loaded 1968 Fabco flatbed truck
Motor Carrier: Bruce Church, Inc.
Type of Operation: Private Carrier
Size of Operation: 32 power units
Total Weight of Truck: 30,600 pounds
Total Length of Truck: 29 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The flatbed truck, loaded with 350 boxes of lettuce, had just rounded a right curve with a 600-foot radius and was traveling down a 4 percent grade. At some point the truck crossed into the southbound lane, nearly went off the roadway (as evidenced by a tire mark on the west edge of the roadway), crossed back over the northbound lane, went off onto the east shoulder, and overturned. The truck came to rest on its roof facing west with the front of the truck approximately 5 feet from the edge of the roadway.

The 1968 Fabco flatbed truck was a low-speed, all-wheel-drive vehicle, designed especially to be operated in fields at "crawling" speeds. The top highway speed for this vehicle was approximately 50 mph. A postcrash examination of the truck revealed no mechanical defect that would have contributed to the cause of the accident.

The driver's compartment of the Fabco truck was considered a "half cab," and has a door only on the left side. The roof of the cab, at the juncture of the windshield, was crushed approximately 1 foot. However, the driver's door would swing freely. The vehicle was not equipped with a seatbelt. The NTSB investigator was unable to determine with certainty if the driver jumped from the moving truck or was ejected during the rollover. The driver was found laying along the south side of the truck near the tandem wheels.

The driver possessed a valid California and Arizona operator's license at the time of the accident. A record check with both states failed to reveal any violations or accidents in the past 3 years. The driver was arrested for Driving Under the Influence of Intoxicating Liquor in Arizona on January 28, 1984. For this he received a 6 month suspension of his driving privleges and 1 year probation. The driver signed a statement of intent with his

company, agreeing to abide by the new federal law which prohibited multiple licenses for commercial drivers. However, a record check for California revealed a expiration date of November 7, 1989 and for Arizona, November 7, 1988.

The carrier was an agricultural concern that grew its own produce and marketed it with local shippers. The trucking portion of the business was primarily engaged in hauling the produce from nearby fields to a local shipper, with one way trips seldom exceeding 40 miles. By definition, they were a "private carrier." Several times a year, the entire operation was moved to allow the growing of seasonal crops. One of these moves was to Arizona. An inquiry with the Office of Motor Carrier Safety revealed that due to this interstate move, the corporation would have been responsible for at least some Federal Motor Carrier Safety Regulations. The scope of this investigation did not conclude exactly what regulations would be applicable. The Office of Motor Carrier Safety in California revealed that Bruce Church, Incorporated, was not currently on their list of carriers, nor was there any record of them being audited.

The truckdriver had 15 years experience, but no formal training. He first learned to drive in the fields while working as laborer. He was not required to keep logs; however, his company time cards revealed that during the previous 72 hours he had a total on duty time of 12 hours and driving time of 6 hours. It should be noted that this accident occurred on Monday morning and the driver had been off duty the previous Saturday and Sunday. On the morning of the accident, he drove about 50 miles, with 2 hours driving time and a total on duty time of 4 hours.

An open beer can was found outside the displaced windshield of the overturned truck. The company dispatcher related that he saw the driver on the morning of the accident at approximately 6:30 a.m. and did not notice any abnormal behavior.

Blood samples were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood contained 0.18 percent alcohol. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also analyzed by SmithKline Laboratories of Salinas, California. This analysis indicated a BAC of 0.17 percent.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the driver due to alcohol use.

CASE NO.: 8

Investigation No.: SEA-88-H-TR02
Accident location: U.S. 50, Kyburz, California
Lanes: 2
Shoulders: Right shoulder 1.5 feet of asphalt, left shoulder 2 to 10.6 feet of asphalt surface
Median: None
Features: Mountainous, curving, 6 percent downgrade
Date and Time: October 13, 1987, 12:40 p.m.
Ambient Conditions: Clear, 63°F, daylight, and d.y
Heavy Truck Involved: 1987 conventional Ford tractor in combination with a loaded 48-foot van trailer
Motor Carrier: Western Trucking, Inc.
Type of Operation: Common Carrier
Size of Operation: 5 power units
Total Weight of Truck: 78,940 pounds
Total Length of Truck: 66 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The loaded combination vehicle was traveling at a witness estimated speed of 60 to 70 mph, down a 6 percent grade, and entered an 800 foot radius curve to the left. The driver failed to negotiate the curve and the vehicle rolled over. The tractor came to rest about 200 feet down the road. Only the front bottom portion of the trailer stayed attached to the tractor. The remainder of the trailer came to rest on its right side about 150 feet down from the curve. Witnesses first to arrive at the scene stated that the driver was trapped inside the cab and that they lost his pulse after 10 minutes. These witnesses also reported smoke coming from the wheels of the tractor and trailer.

Both the tractor and the trailer were destroyed in the accident and the load was spilled from the trailer which was torn open. The tractor came to rest on its top, with the front portion of the roof crushed down to the instrument panel. The majority of the damage on the tractor was to the right side and roof.

The s. ing axle was loaded with 9820 pounds, while the drive axles carried 32,90? pounds and the trailer axles 36,180 pounds. When the brake adjustments were checked by the California Highway Patrol, they found nine out of ten brakes beyond the legal limit for adjustment. Driving records showed that the driver had been cited for his brakes being out of adjustment twice in the last 25 months.

Only one page of the logbook was even partially filled out. That particular page was dated six days before the accident, and had no other information recorded. Fuel receipts and other paperwork showed that he drove

at least 1671 miles in three days, with his third day ending at 12:40 p.m., the time of the accident. Assuming he drove 10 hours each day gives him an average speed of 56 mph. There was no evidence to indicate when he started the last day or when he planned to stop.

The driver did not possess a valid operator's license at the time of the accident. Licenses from California and Virginia, which he had held at the same time, were suspended for failing to pay fines. Arizona records showed him as suspended, meaning that he would not have received a license in that State if he had applied.

The motor carrier did not keep a driver's qualification file. No pre-employment background checks were done on drivers, and the carrier never bothered to check on the status of the accident driver's license. The driver had six years experience driving heavy trucks with no formal training. He had been hired by the motor carrier two to four weeks before the accident for the second time. The carrier stated that he had fired the driver for damaging a transmission about one and one-half years before. Driving records revealed that the driver had been cited 22 times in the last three years, seven of which were moving violations. There were two accidents on his record for the same three years.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 8 ng/ml of the non-psychoactive component of marijuana (COOH-THC) and acetaminophen (analgesic). No other drugs, as identified by the NISB testing protocol, were identified.

Blood samples were also screened by the Western Clinical Laboratory of Roseville, California, with negative results.

The California laboratory screened the urine for marijuana and reported it was positive. A confirmation/quantification for marijuana in the urine was not done. The blood screened did not include marijuana or analgesics. A positive urine screen for marijuana is in agreement with the confirmed marijuana in the blood as reported by the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the accident were the improper brake adjustments due to inadequate maintenance.

CASE NO.: 9

Investigation No.: LAX-88-H-TR02
Accident Location: Interstate 210, La Canada, California
Lanes: 4 lanes, divided
Shoulders: Paved, 10 feet each side
Median: Concrete redirecting median barrier
Features: Elevated, slight downgrade
Date and Time: October 16, 1987, 8:40 a.m.
Ambient Conditions: Daylight, clear, dry
Heavy Truck Involved: 1986 conventional cab Peterbilt tractor in combination with a 22-foot trailer
Motor Carrier: CALMAT Co.
Type of Operation: Private Carrier
Size of Operation: 850 power units
Total Weight of Truck: 29,700 pounds
Total Length of Truck: 61 feet
Other Vehicle(s) Involved: Three unoccupied passenger cars
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Peterbilt combination unit was traveling east in the right lane of the four eastbound lanes when a witness reported that the vehicle veered to the right. The witness reported the precrash speed of the truck to be approximately 65 mph; however, tachograph readings indicate a speed of 57 mph. Witness accounts and on-scene evidence indicate that the vehicle approached the right road edge berm at an angle of approximately 15^{0}, then impacted and then rode along the berm for approximately 130 feet before all wheels crossed over into the dirt embankment. A freeway emergency call box and a "W-beam" guardrail in the vehicle's path were damaged. The unit continued to move southeast along the 39-foot wide, 35^{0} negative slope, traveling approximately 174 feet before impacting and surmounting a 4 foot block wall serving as a gravity fence at the freeway perimeter. During this segment of the collision dynamics, the unrestrained driver was ejected out the right door and overrun by the wheels of the vehicle. As the unit surmounted the wall, it struck three unoccupied passenger vehicles.

The combination unit sustained minor frontal damage. The combination unit driver sustained fatal crush injuries when he was overrun by the vehicle's wheels. The unoccupied parked cars sustained moderate damage. There were no contributing mechanical or environmental conditions found.

The truckdriver had been operating this type of vehicle for over thirty years, twenty of them with this company. He had been operating this unit since it was purchased two years earlier. He was appropriately licensed. His driver record indicated no recent moving violations and listed two recent accidents, for which he was listed not at fault. He had been a continual safe-driver award winner and was considered one of the safest drivers in the company.

La Canada, California
Case No. 9

A postcrash inspection of the unit revealed no mechanical defects or deficiencies. This inspection as well as an analysis of the onboard electronic tachograph indicate that the vehicle was in the appropriate gear and operating normally until it veered to the right. The evidence on the right door of a boot print coupled with an odd gear change after the vehicle left the road indicate that the driver probably impacted the gear shift lever and initiated this gear change. All evidence indicates an absence of driver voluntary input or control of the vehicle after the sudden veer to the right. An investigation into the physical condition of the driver revealed that he was obese and was suffering from gout and hypertension. The medical examinations he had received for employment eligibility were annotated with restrictions that he was fit provided he took the medication prescribed for his high blood pressure. An investigation of the attending physician's medical records indicate that the driver was required to take three concurrent high blood pressure medications. At the time of his death, one empty prescription bottle was found in his pocket.

Blood samples from the truckdriver were sent to the Center for Human Toxicology at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. In addition, an expanded test was requested to determine if the driver was taking other medication. No drugs, either as identified by the NTSB testing protocol or by the expanded testing request, were identified.

Blood samples were also tested by the Los Angeles County Forensic Laboratory with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the truckdriver, probably due to cardiac failure.

CASE NO.: 10

Investigation No.: FTW-88-H-TR01
Accident Location: U.S. Highway 701, 7.9 miles south of Four Oaks, North Carolina
Lanes: 2
Shoulders: 12 foot wide, earthen
Median: None
Features: Vertical curve
Date and Time: October 16, 1987, 2:40 p.m.
Ambient Conditions: Clear and Dry
Heavy Truck Involved: Empty 1973 White dumptruck
Motor Carrier: Jerry Wade Phillips
Type of Operation: Contract Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 17,100 pounds
Total Length of Truck: 20 feet
Other Vehicle Involved: 1979 conventional Ford tractor in combination with a loaded 45-foot van trailer

Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

A group of four vehicles was travelling south on U.S. Highway 701 followed by the combination unit which was cresting a vertical curve approximately 2/10-3/10 of a mile behind them. The lead passenger car in the group began slowing to turn right into a private drive and, according to this driver, the vehicles behind her began slowing rather abruptly. As this was occurring, the combination unit began descending a 3 percent downgrade at a witness estimated speed of 60-70 mph, failed to stop, and swerved into the northbound traffic lane where it struck a northbound dumptruck head-on. The Ford combination driver stated that he attempted to stop but his brakes went soft forcing him to swerve out of his lane in an attempt to avoid the slowing cars. The dumptruck skidded approximately 178 feet prior to impact and, at impact, the front of the dumptruck contacted the left side frame of the Ford tractor and the left side of the van trailer. Tire marks in the northbound lane show that the combination unit was aligned diagonally to the traffic lane and swerving to the right when the impact occurred. From the impact area, the dumptruck rotated counterclockwise approximately 180° and the combination unit overturned onto its left side and slid approximately 55 feet. In the southbound lane approximately 100 feet north of the private drive, there were skidmarks made by the other trucks that were slowing to avoid the turning car. The driver of the car making the right turn into the private drive stated that she was using her turn signal and this was verified by the truck driver that was immediately behind her.

The collision forces disintegrated the dumptruck cab at impact and the driver was killed. The Ford tractor frame and the van trailer were destroyed but the driver was not injured.

Four Oaks, North Carolina
Case No. 10

The dumptruck driver had been operating this type of vehicle for approximately one year. He had been licensed by the State of North Carolina to operate this class of vehicle for approximately 5 years. The combination unit driver had been operating this class of vehicle for about 15 years. Neither driver had attended a commercial driving school. The dump truck driver's license record shows that he had not been convicted of any traffic law violations nor had he been involved in other traffic accidents.

The combination driver's license record showed that he had his license suspended in 1980 for a period of 30 days. This resulted from the conviction of 6 moving violations during 1978 and 1979. However, he had not received any traffic convictions since 1979.

The investigation revealed that the brakes on the combination unit were properly adjusted and the drums and linings were in good condition. An examination of duty schedules showed that both drivers were complying with hours of service regulations. During the examination of the combination driver's records it was learned that he had never been certified as medically qualified to drive.

Blood samples from the dumptruck driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was ford driver's failure, for unknown reasons, to respond in a timely manner to the vehicles slowing ahead.

CASE NO.:__11__

Investigation No.: CHI-88-H-TR01
Accident Location: U. S. Highway 45 and County Highway K, Bristol, Wisconsin
Lanes: 2
Median: None
Features: Right curve, 2 percent downgrade
Date and Time: October 19, 1987, 6:41 a.m.
Ambient Conditions: Roadways wet, temperature about 50°F
Heavy Truck Involved: 1975 conventional Kenworth tractor
Motor Carrier: Arrow Marine Transport
Type of Operation: Common Carrier
Size of Operation: 29 power units
Total Weight of Truck: About 16,000 pounds
Total Length of Truck: 24 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The bobtail tractor was traveling north on U.S. Highway 45 through a light rain. As it was negotiating a right curve on a 2 percent downgrade, it rotated clockwise on its vertical axis and skidded from the roadway to the northeast corner of the intersection into a 5-feet 8-inch-deep drainage ditch. The left side of the tractor impacted the ditch embankment about 20 feet north of the roadway edge. After the initial impact the unit vaulted about 30 feet, then landed on the ground resting on its roof. At final rest fuel was leaking from the ruptured tank. However, the fuel did not ignite and there was no fire.

The tractor cab was crushed downward about 25 inches and the unrestrained driver was fatally injured. The driver could not be extricated from the cab until the unit was uprighted and the roof was removed using a combination of the Jaws-Of-Life and a tow truck winch.

The driver had 15 years of experience operating heavy trucks, 6.5 months with the carrier and accident vehicle. He possessed a valid Illinois Class D driver's license with no recorded traffic violations. The tractor was owned by Waite Trucking and was leased to Arrow Marine Transport. Neither carrier maintained documented records of the truck or its driver. The truck owner knew the driver personally and knew of his past driving experience with 2 Illinois moving companies. The truck owner did not make a driver's personnel file, require the driver to take mandatory DOT road/written tests, or obtain a valid medical certificate prior to employing him.

The leasing motor carrier had a policy requiring the inspection of its leased trucks every 30 days, however, they had never inspected this tractor. The carrier also has a policy requiring its leased drivers to attend safety meetings and had recently suspended the accident truck and driver for failure to attend a safety meeting. This was where the leasing carrier's records end. The carrier's load

bills for the truck were all signed in the truck owner's name by the driver. This was in violation of the leasing agreement which required the owner to drive.

The carrier was audited by the OMC just before the fatal accident occurred. Following the audit the carrier began upgrading their files on all trucks and drivers, leased and owned, to include driver qualifications.

An examination of the highway at the truck's approach to the intersection revealed the presence of multiple skidmarks made by other vehicles in the past.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained salicylate, an anangesic. No other drugs, as identified by the NTSB testing protocol, were identified.

Urine samples from the truckdriver were also tested at the request of the State of Wisconsin with negative results.

The Wisconsin laboratory screened the urine for ethanol (alcohol) only which would not identify an analgesic. The urine was reported negative for ethanol in agreement with the Center for Human Toxicology blood test finding.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the truckdriver's loss of control on the wet roadway, possibly due to an unknown vehicle's failure to yield at the stop sign controlled intersection. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 12

Investigation No.: LAX-88-H-TR04
Accident Location: SR-134 at Buena Vista Blvd., Burbank, California
Lanes: Four westbound, 12 feet wide portland cement surface
Shoulders: Right shoulder Asphalt surface 8 feet wide
Median: 10-foot asphalt surface with New Jersey Barrier
Features: At grade
Date and Time: October 20, 1987, 3:50 p.m.
Ambient Conditions: Daylight, clear weather conditions
Heavy Truck Involved: 1964 Freightliner COE tractor in combination with two loaded trailers
Type of Operation: Contract Carrier
Size of Operation: 7 power units, 2 trucks
Total Weight of Truck: 71,990 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: Pickup truck
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit (V-1) was traveling westbound on SR-134 approaching Buena Vista Blvd., at a witness estimated speed of 60-65 mph. It was observed by numerous witnesses to be cutting in and out of traffic, passing traffic, and weaving erratically across traffic lanes. The vehicle was finally observed to move from the W-2 lane and veer sharply to the right across two traffic lanes and strike a pickup truck which had moved on to the shoulder of the freeway. The combination vehicle continued to its right after striking the pickup truck, plunged over the freeway dirt embankment, and continued through the freeway perimeter fence. It subsequently overturned and caught fire in an open field.

During the collision sequence the tractor and both trailers were totally destroyed. The driver of the Freightliner was burned beyond recognition. The driver of the pickup truck was restrained and was not injured. The pickup truck received minor damage to the left front fender.

A postcollision search of vehicle parts recovered the pitman arm belonging to the power unit among the remains of the twisted mass of metal. The pitman arm was separated from its steering gear box and the sector shaft was broken. The steering gear box and pitman arm was submitted to the Materials Laboratory of the NTSB for examination. The lab concluded that the sector shaft and pitman arm were subjected to torsional overstress. A visual inspection of the remaining subsystem was conducted, and found the battery cables to exhibit melted balls of metal (cable wire) on the ends. Further inspection revealed no apparent mechanical deficiencies.

The truckdriver had been operating heavy trucks for approximately eight years. According to his mother, he had been employed by the carrier the majority of the eight-year period. She further related that her son and the

carrier were childhood friends, and grew up around the trucking industry. Additionally, her son had been diagnosed a diabetic at eight years of age and that he was presently injecting about 60 units of insulin a day, usually in the morning hours.

The mother also acknowledged her son's past use of illegal drugs, but denied that he was currently using them.

A California Department of Motor Vehicle driving history search, revealed that from 9-23-85 to 9-24-87, the truckdriver had received 16 traffic convictions and was involved in two accidents, both involving heavy trucks. Further it was discovered by use of the National Driver Register (NDR) that he had been placed on probation by the State of California from 1-21-86 to 1-27-87 for being a negligent operator. Two of the violations previously recorded were received while on probation but were not recorded in time to affect his probation period

The carrier had been in operation since 1982, operating under California PUC permit T-139597. The carrier was registered as a contract carrier and at the time of the collision employed eight drivers. The carrier reported that the load of steel pipe was being transported from Wilmington, California, to Hayward, California, and that the driver was not under any restrictive time constraints.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood contained 1,400 ng/ml of methamphetamine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also analyzed by the Los Angeles County Medical Examiner. This analysis indicated that the blood contained 1,000 ng/ml of methamphetamine.

The methamphetamine values from the two laboratories are different by an amount that is larger than expected based upon measurement uncertainties. The difference may be partly or mainly due to the laboratories receiving blood specimens that were taken from different locations.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the truckdriver's impairment due to his use of methamphetamine.

CASE NO.: 13

Investigation No.: LAX-88-H-TR05
Accident Location: I-5 northbound 3.5 miles north of Fort Tejon, California
Lanes: 4 northbound 12 feet wide concrete surface
Shoulders: Right shoulder asphalt surface 8 feet wide
Median: Raised New Jersey barrier
Features: 6 percent downgrade
Date and Time: October 25, 1987, 10:30 p.m.
Ambient Conditions: Dark, clear and dry
Heavy Truck Involved: 1978 COE 3-axle Peterbilt tractor in combination with a loaded trailer
Motor Carrier: D & E Transportation
Type of Operation: Common carrier
Size of Operation: 4 power units
Total Weight of Truck: 72,606 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 3 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit, occupied by its driver and 2 passengers, was descending a six percent grade at a witness estimated speed of 75-80 mph. The grade was clearly marked 35 mph for trucks; however, the unit was considered to be a runaway truck by witnesses. The truck was observed to be traveling in the number two of four northbound lanes and veered to the right across traffic lanes to exit the freeway at the runaway truck ramp. The vehicle entered the truck ramp and traveled approximately 400 feet into the arrester bed before exiting on the west side of the ramp. It then continued another 100 feet as it crossed the arrester bed's paved shoulder and then went off the side of a descending dirt embankment and overturned. According to the California Highway Patrol, passersby arriving at the scene immediately after the collision found the tractor drive axle brakes on fire, while the trailer axle brakes were cool.

The tractor was not equipped with a restraint system. The three vehicle occupants were ejected and killed by blunt force trauma injuries. The tractor was destroyed. The trailer received minor damage.

The driver had been operating heavy trucks in Mexico and the U.S. for about five years. The carrier related that the driver had only been employed by them for 2 1/2 weeks, and the accident trip was the drivers first solo trip for D&E Transportation. A California Department of Motor Vehicle check revealed that from 5-30-86 to 7-15-87 the driver had been convicted of six moving violations-- 2 registration, 1 brake, 1 hours of service, 1 unlicensed driver, 1 overweight violation. In addition, he had been involved in one accident. A 50-state license check revealed that the driver was suspended from driving in the State of Texas. The National Driver Register did not have a record of the driver.

Fort Tejon, California
Case No. 13

The front brakes on the power unit were removed precollision. The examination of the power unit found brakes on axles #2 and 3 of the tractor. Axle #2 was equipped with spring brakes and the push rod travel was within recommended standards. Both brake drums exhibited a brownish - rust color on their external surfaces and a bluish hue with heat checking on their inner wear surfaces. The brake pads were severely deteriorated with an appearance of being scorched and crumbly. Axle #3 was without spring brakes and the push rod travel was within recommended standards. The brake lining was found to be in a charred and degraded condition. Both brake drums exhibited the same physical characteristics as axle #2.

Axle #4 - The left side pushrod travel of axle #4 was not within recommended standards. The drum and lining assembly exhibited discoloration and glazing. Also, the left brake clevis lock nut was defective, preventing the brake from releasing properly. Axle #5 - The pushrod travel was found to be within recommended standards, however, the left side brake lining was worn to the rivets and had left depression into the brake drum. The brake drums and lining on axle #5 exhibited both heat checking and scoring. Additionally, a air loss of 20 PSI was detected at the exhaust port of the relay emergency valve during the unapplied brake test. The applied brake test revealed all four brake chambers to be properly secured and functional. No applied brake air loss was detected.

The carrier did not maintain records for his equipment nor did he maintain driver qualification files. The carrier had never been audited.

The California Highway Patrol advised that the truck tractor combination vehicle entered the escape ramp at a slight angle. Also, the investigation revealed that on 10-24-87 at 3 a.m. another truck had entered the truck escape ramp and had to be removed. The ramp had not been regroomed at the time of this incident by CALTRANS, but was regroomed on the next morning.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 500 ng/ml of cocaine, 870 mg/ml of benzoylecognine (metabolite of cocaine), 12 ng/ml of the psychoactive component of marijuana (THC), and 36 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also analyzed by the Kern County Coroner's Office. This analysis indicated 1,960 ng/ml of cocaine and 430 ng/ml of benzoylecognine (metabolite of cocaine).

The California laboratory did not test the blood for marijuana which explains the difference in marijuana findings. Cocaine is readily changed (hydrolyzed) to the metabolite, benzoylegonine. This hydroysis appears to have occurred since the Center for Human Toxicology reported a lower cocaine value and a higher metabolite concentration than that reported by the other laboratory.

Fort Tejon, California
Case No. 13

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the driver due to his use of cocaine and marijuana.

CASE NO.: 14

Investigation No.: ATL-88-H-TR03
Accident Location: Georgia 273, 18.1 miles south of Blakely, Georgia
Lanes: 2
Shoulders: Grass; 6 feet wide each side
Median: None
Features: At grade, level and tangent
Date and Time: October 27, 1987, 7 p.m.
Ambient Conditions: Clear and dry, darkness
Heavy Truck Involved: 1978 White tractor in combination with a loaded log trailer
Motor Carrier: Clemon Robinson
Type of Operation: Contract carrier
Size of Operation: 1 tractor
Total Weight of Truck: 64,430 pounds
Total Length of Truck: 55 feet
Other Vehicle Involved: 1983 Freightliner tractor in combination with a loaded flatbed trailer

Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 0

FACTUAL SUMMARY:

The White combination unit (log truck) was traveling east on a portion of Georgia Highway 273 that "dead-ends" at a log processing facility on the Chattahoochee River. The Freightliner combination unit was enroute from Ohio to a factory located on Georgia Highway 370, a short distance south of Highway 273. The Freightliner driver reportedly traveled north on GA 370 and failed to observe the factory. He subsequently turned onto GA 273 and traveled east. The driver stopped the Freightliner combination unit on the right and several feet off the roadway within a closed Georgia Department of Transportation "truck-check" area. By inquiring at a private business across the highway, he learned that the factory was southwest of his location. After re-entering the Freightliner tractor, the driver began an abrupt "U" turn into the path of the westbound log truck. In the westbound traffic lane, the front of the log truck struck the left side of the flatbed trailer of the Freightliner combination unit. Several logs slid forward from the trailer and penetrated the tractor cab of the log truck. No skidmarks were found on the roadway. Investigating police estimated the impact speeds at five mph for the Freightliner combination and 40 mph for the log truck.

The tractor of the log truck was destroyed by a combination of the frontal collision and the logs on the trailer crushing the cab. The log truck driver was killed. He was found unbelted and entangled in the driver area of the crushed cab. The trailer of the Freightliner combination unit was extensively damaged; the driver reported no injury.

A postcrash inspection revealed that the front brakes of the log truck were out of adjustment. No other defects were found. However, the mechanical condition of the log truck was not a factor in the accident.

Blakely, Georgia
Case No. 14

The log truck was owned and operated by the driver. After over 30 years of experience as a truckdriver, he had recently purchased both the White tractor and the log trailer from his former employer. At the time of the accident, he was engaged in the interstate transportation of logs; specifically from Florida through Alabama to Georgia. No evidence was found that driver records were maintained as required by Federal regulations. The truckdriver was not preparing daily logs, but there was no evidence of excessive hours of service. In the last five years, he had two accidents with no related convictions. He had three convictions for minor moving traffic violations.

Blood samples from the Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Freightliner driver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the driver of the Freightliner combination unit to yield right of way before attempting a "U" turn. Contributing to the severity of the accident was the lack of an adequate barrier between the load and the cab of the power unit.

CASE NO.: 15

Investigation No.: NYC-88-H-TR01
Accident Location: U.S. Route 46 at N.J. Route 519, in Belvedere, New Jersey
Lanes: Two
Shoulders: Right 7.4-feet-wide asphalt, left 8.6-foot asphalt
Median: None
Features: Signalized intersection, at grade
Date and Time: October 29, 1987 at about 7:15 a.m.
Ambient Conditions: Clear, daylight, 40°F and dry
Heavy Truck Involved: 1983, 2-axle, Volvo truck
Motor Carrier: Leonard Transportation
Type of Operation: Common Carrier
Size of Operation: 12 tractors and 4 trucks
Total Weight of Truck: About 12,640 pounds
Total Length of Truck: 28 feet
Other Vehicle Involved: 1985 Volkswagen, and a 1972 Chevrolet
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 4

FACTUAL SUMMARY:

The Volvo straight body truck was westbound on U.S. Route 46 approaching the intersection with N.J. Route 519. As the truck entered the intersection, it collided with a northbound 1985 Volkswagen with one unrestrained occupant . The truck then went out of control and crashed into an eastbound 1972 Chevrolet with 3 unrestrained occupants. During the collision with the Chevrolet, the truck overturned and the unrestrained driver was ejected through the front windshield and was killed. One of the Chevrolet occupants was seriously injured and 2 received minor injuries. The Volkswagen occupant was ejected during the crash and received moderate injuries. The truck was loaded with 2- 55 gallon drums of Methyl Ethyl Ketone which were not damaged during the crash.

The intersection was controlled by both overhead and postmounted traffic signals, and the speed limit for Route 46 was 50 mph. Witnesses stated that the truck driver entered the intersection against a red signal, and was blowing the horn as he did so. There were no indications of pre-impact braking, and no mechanical defects were discovered that would have limited the truck's braking ability. Calculations based on postimpact tiremarks indicated that the truck was traveling at about 38 mph after its collision with the Volkswagen.

A check of the truckdriver's record revealed that he had been cited for 31 traffic violations, and had been involved in 6 accidents in the past 4 years. He had both a valid New Jersey operator's license and a New York license which had been revoked 19 days before the crash. The driver had been operating straight body trucks for 4 years, and had been with his current employer for about 2 months. When the driver was hired, he failed to notify his employer of his violation and accident history, or his dual licenses. The driver had not received any formal driver training.

Belvedere, New Jersey
Case No. 15

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were also conducted by the New Jersey State Medical Examiner's Office with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the truckdriver to yield at the stop light controlled intersection. Contributing to the severity of the truckdriver's injuries was his failure to use the available restraint.

CASE NO.: 16

Investigation No.: SEA-88-H-TR03
Accident Location: Interstate 5, near Tracy, California
Lanes: 6 lanes, divided
Shoulders: Right, 8 feet, asphalt
Left, 4 feet, asphalt
Median: 70 feet wide, dirt
Features: Straight, level
Date and Time: October 29, 1988, 5:15 a.m.
Ambient Conditions: Dark, heavy rain
Heavy Truck Involved: 1983 COE Peterbilt tractor in combination with a 24-foot flatbed semitrailer and a 30-foot flatbed full trailer, both loaded
Motor Carrier: Yandell Truckaway
Type of Operation: Contract Carrier
Size of Operation: 42 power units
Total Weight of Truck: 44,000 pounds
Total Length of Truck: 69 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit departed the Tracy terminal of Yandell Trucking, Inc. at approximately 5 a.m., and was enroute to Fairfield, California. After having exited the town of Tracy, the unit was traveling eastbound on 11th Street, which turned into the on-ramp for Interstate 5 northbound. The ramp crossed over Interstate 5 prior to curving gently to the left, then to the right, and simultaneously going downgrade. It then became straight prior to joining the freeway. The ramp continued parallel to the freeway for about 600 feet and then ended just prior to a bridge which was 196 feet in length. According to a witness traveling in the opposite direction, he viewed the combination near this juncture when a sudden downburst of rain began. He did not observe any other northbound traffic. At some point while attempting to enter the freeway, the combination unit began to go out of control, crossed the bridge, and slid off the left side of the roadway into the dirt median. The tractor and both trailers overturned. The tractor came to rest facing east, 22 feet from the west edge of the northbound lanes and approximately 275 feet north of the bridge. The second trailer remained attached to the first trailer, forming a "V" shaped configuration. The front of the first trailer was facing east toward the northbound lanes and the front of the second trailer was facing west toward the southbound lanes.

The unrestrained driver was pinned in the overturned truck. The driver sustained serious, but not life-threatening injuries. The official cause of death was noted by the pathologist to be "positional asphyxia." The time of death was listed by the pathologist to be 5:15 a.m., the same as the time of occurrence.

Tracy, California
Case No. 16

It could not be determined with certainty how much rainfall actually fell on this section of the roadway in recent weeks. However, a local newspaper weather observer reported that for the period July 1, to October 10, 1987, there was no rainfall recorded for the Tracy area. From October 11 to October 28, there was a total of .54 inches recorded, with .30 inches on the 28th, the day prior to the accident. According to the witness, the sudden downburst of rain only lasted for about a 1/2 mile stretch of roadway. On October 30, the day after the accident, a California Highway Patrolman accompanied by an NISB investigator tested the surface of the bridge to determine the drag factor, as it appeared to have smooth areas worn by tire tracks. Water was poured onto the roadway and the drag sled pulled. The surface was tested in several locations and drag factors ranged from .67 to .77. Since the residue of oil on the roadway at the time of the accident was not known, an accurate determination of the drag factor could not be made. There were "erasure type" tire marks leading to the final resting position of the combination unit.

The 1983 Peterbilt was a 2-axle, cab-over-engine, truck tractor, and is powered by a Cummins Formula 300 6-cylinder engine. It has a wheelbase of 144 inches. The left side of the cab was heavily damaged. The roof was crushed 18 inches on the left side of the cab near the drivers compartment. The rear tires of the tractor had regular "highway type tread." All four rear tires appeared to be similarly worn, with tread depths measuring from 3/32 inch to 5/32 inch. According to Federal Motor Carrier Safety Regulations, the minimum allowable tread depth for all tires is 2/32 inch, other than those on the front steering axle. The front tires appeared to be in excellent condition and had a minimum tread depth of 14/32 inch. No mechanical defects were found on either the tractor or the trailers.

The tractor was equipped with an engine retarder made by the Jacobs Manufacturing Company. The brake was equipped with an "On/Off" Master Switch and a 3-position Progressive Braking switch. The #1, #2, and #3 positions activate 2, 4, and 6 engine cylinders, respectively. The #1 position provides the least amount of engine braking and #3 provides for the maximum. In this case, the NTSB investigator, upon examination of the tractor, found the Master Switch in the "On" position and the Progressive Braking switch in the #2 position. According to a manual published by Jacobs, the following procedures are recommended for operation of the brake on wet or icy pavement: The driver should begin with the Master Switch in the "Off" position until it can be determined that the vehicle is maintaining traction and stability. After it has been determined that the vehicle is maintaining stability, the driver may then turn the Master Switch to the "On" position, with the Progressive Braking switch in the #1 position. If the tractor drive wheels lock up or there is a fishtail motion, the driver is to immediately turn the Master Switch "Off." If the vehicle remains stable, he may move the Progressive Braking switch to a higher position. (Note: This is a partial summary of the instructions in the "Jacobs Engine Brake, Professional Driver Techniques and Owner's Manual," published by the Jacobs Manufacturing Company in 1981.)

Tracy, California
Case No. 16

While the exact speed of the tractor at the time of control loss is not known, the engine was governed at the factory to reach a maximum of 1800 RPM's. Using the formula "Speed = RPM (60)/Rm (axle ratio)(gear ratio)," the maximum speed attainable by the tractor was calculated to be 60.4 mph.

The driver did not go through a formal training program, but was taught to drive by a professional truckdriver from whom he purchased his first truck approximately 3.5 years before. It is unknown if he was ever trained in the proper use of the engine retarder.

The driver held a current "Class 1" California drivers license, valid for operating a combination vehicle. During the past 3 years, he received 3 speeding citations. He was involved in an accident on October 1, 1987 in California, but was not charged with a violation. A records check with all 50 states revealed that he held only a California license. A National Driver Register inquiry did not reveal any suspensions or revocations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were also conducted at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for the existing roadway conditions. Probably contributing to the control loss was the marginal tread depths on the drive axles. Contributing to the severity of injuries was the inadequate cab structure of the power unit.

CASE NO.: 17

Investigation No.: SEA-88-H-TR04
Accident Location: S.R. 99, Bakersfield, California
Lanes: 6 lanes, divided
Shoulders: Asphalt - right 20.5 feet, left 2.6 feet
Median: 46-foot earthen
Features: Elevated, tangent
Date and Time: November 2, 1987, 1:50 a.m.
Ambient Conditions: Raining and dark with street lights
Heavy Truck Involved: 1973 COE White Freightliner tractor in combination with 2 loaded 27-foot flatbed trailers
Motor Carrier: Poultry Transport Systems
Type of Operation: Contract Carrier
Size of Operation: 16 power units
Total Weight of Truck: 78,730 pounds
Total Length of Truck: 67 feet
Other Vehicle Involved: 2 passenger cars
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 2 Other Injuries: 2

FACTUAL SUMMARY:

The loaded doubles combination was traveling southbound at a tachograph recorded speed of 60 to 63 mph when a Chevrolet attempted to enter the roadway from an entrance ramp to the right of the truck. According to witness statements, the truckdriver signaled left and moved into the center lane. He then began to move left into the median lane, but came back into the center lane just before the tractor struck the Chevrolet on the left side at the driver's door. The Chevrolet rotated off the front of the tractor and was struck by an Oldsmobile traveling in the median lane to the left of the truck. Both passenger vehicles came to rest in the median. Tiremarks were found intermittently for a distance of about 600 feet to the right onto the outside shoulder, across all three lanes of traffic, and onto the median where the tractor and both trailers came to rest. The tractor and first trailer came to rest on their roofs; the rear trailer was laying on its left side. The tractor and trailers remained coupled.

The left side of the tractor cab roof was crushed down to the level of the instrument panel. The tractor was destroyed, the first trailer was substantially damaged, and the rear trailer received only minor damage. The collision destroyed the Chevrolet. The Oldsmobile sustained minor damage to the front left corner. Rescue workers found the unrestrained truckdrriver pinned inside the cab with no pulse. Both unrestrained occupants in the Chevrolet received fatal injuries; the driver was pronounced dead at the scene, the passenger died four days later. The two unbelted occupants in the front seat of the Oldsmobile received minor injuries; the unbelted rear seat passenger was not injured.

The truckdriver had seven years experience operating heavy trucks, with four of those years driving doubles. He had received no formal training. He possessed a valid California Class 1 operator's license, and his driving record for the past five years showed no violations or accidents

Bakersfield, California
Case No. 17

Blood samples from the truckdriver driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 350 ng/ml of methamphetamine and 120 ng/ml of psuedoephedrine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also analyzed by the Kern County Coroner's Office. This analysis indicated that the blood sample contained 160 ng/ml of methamphetamine, 89 ng/ml of amphetamine, and 790 ng/ml of psuedoephedrine.

Blood samples from the Chevrolet driver were analyzed by the Kern County Coroner's office. This analysis indicated that the blood sample contained 0.13 percent alcohol, 10 ng/ml of cocaine, and 24 ng/ml benzoylecognine (metabolite of cocaine).

The total amount of stimulants, methamphetamine plus amphetamine, reported by the California laboratory is in agreement with the Center for Human Toxicology reported stimulant, methamphetamine, value. However, the concentration of the psuedoephedrine as determined by the two laboratories is significantly different. It could not be determined if a common blood supply (for example, cardiac blood) was provided to each laboratory.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Chevrolet driver due to alcohol and cocaine use. Contributing to the severity of the truckdriver's injuries was the inadequate cab structure of the power unit.

CASE NO.: 18

Investigation No.: LAX-88-H-TR06
Accident Location: Interstate 5 in Newhall, California
Lanes: 8 Lanes, divided
Shoulders: Right, 17 feet asphalt and 8 feet dirt
Median: 10 feet Asphalt
Features: Straight, 5 percent downgrade
Date and Time: November 2, 1987, 3:45 p.m.
Ambient Conditions: Cloudy, daylight, dry, 60°F
Heavy Truck Involved: 1968 COE Kenworth tractor in combination with a loaded 42-foot trailer
Motor Carrier: Lee and Nel Trucking
Type of Operation: Common Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 69,550 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was traveling south on a tangent downgrade at a witness estimated speed between 55 to 60 mph in a posted 40 mph zone. The driver was enroute to Los Angeles from Bakersfield, California with a 42,000 pound load of lettuce. According to witnesses, the unit veered to the right across the freeway shoulder and traveled up and alongside the ascending slope of the west embankment. The vehicle began to roll to its left, and the driver jumped out of the tractor's left door. The trailer rolled over onto the driver, and he was dragged along the roadway and sustained fatal injuries.

The tractor sustained moderate crush damage to the cab and left front frame area. The trailer sustained minor damage at the left side. The driver was found on the freeway shoulder north of the stopped unit. Examination revealed that the drivers seat was not equipped with a seat belt. The left tractor door was torn away, the windshield was missing, and the left front section of the cab had been driven rearward into the steering wheel column. There were no other occupants in the unit. Examination of the brake system by the California Highway Patrol commercial vehicle inspection unit revealed that the tractor steering axle was not equipped with brakes, and that the brakes on 3 of the remaining 4 axles were out of adjustment.

The 63-year-old driver held a valid California Class 1 Operators license for the type vehicle being driven. According to the carrier, the driver also had a valid medical certificate. The driver's California Department of Motor Vehicles record listed eight violations from 9-04-85 to 10-24-87. The record revealed a drunk driving conviction, 30 days jail time, and 36 months probation. Also included in the record was one accident and two failure to appear violations. The National Driver Register had no record of the driver. A friend of the driver advised that he had driven heavy trucks for at least 12 years. The carrier advised that the driver had a minimum of ten years experience, however, he had no records on the driver. The carrier

stated that he had used this driver only once before, in mid-October. The carrier knew little about the driver except that he could be found hanging around truckstops doing odd jobs and driving on occasion for other truckers.

The motor carrier made no background check on the driver and had no qualification file. They had no medical certificate on the driver nor did this investigation reveal that one existed. Neither did they maintain inspection and maintenance records of the involved unit. They hired the driver on the spot, at a truck stop in Los Angeles, because the owner needed the day off. The owner advised that he had adjusted the brakes on the tractor and trailer at about 6 a.m. the same day the accident occurred.

The motor carrier had been assigned CAL-T-Permit #142349 by the Public Utilities Commission. However, according to the PUC, the permit was revoked in 1986. They were unable to explain the reason for the revocation other than the fact that it had to be for lack of insurance or failing to pay required fees. Additionally, they had no way of knowing if the carrier was operating or not.

An autopsy of the driver revealed minimal atherosclerosis of the thoracic aorta, digtal focal atherosclerosis of the abdominal aorta, and focal atherosclerosis with acute thrombosis of the right coronary artery producing 80 percent obstruction.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 4 ng/ml of the psychoactive component of marijuana (THC), 35 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 390 ng/ml of benzoylecognine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also analyzed by the Los Angeles County Medical Examiner's Office. This analysis indicated that the blood sample contained 20 ng/ml of cocaine and 260 ng/ml of benzoylecgonine. A close friend of the driver reported that the driver used marijuana on occasion and that he had recently experienced the death of a brother. The California laboratory did not test for marijuana.

The 20 ng/ml of cocaine reported by the California laboratory is below the 25 ng/ml testing cut-off used by the Center for Human Toxicology. The benzoylecgonine values are significantly different and may be attributed to sending blood specimens to the two laboratories that were collected from different sources in the body.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to his use of cocaine and marijuana. Probably contributing to the accident were the improperly adjusted brakes.

CASE NO.: 19

Investigation No.: DEN-88-H-TR02
Accident Location: California State Highway 99, near Pixley, California
Lanes: 4 divided
Shoulders: Right, 8 feet 10 inches asphalt;
left, 1 foot 7 inches asphalt
Median: Varying widths, earthen
Features: Straight and level
Date and Time: November 2, 1987, 11:55 p.m.
Ambient Conditions: Clear and dry
Heavy Truck Involved: 1978 Freightliner tractor in combination with two loaded 28-foot flatbed trailers
Motor Carrier: Stan's Trucking
Type of Operation: Contract Carrier
Size of Operation: 21 power units
Total Weight of Truck: Approximately 66,570 pounds
Total Length of Truck: 71 feet
Other Vehicle Involved: 1966 Ford Falcon
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 2

FACTUAL SUMMARY:

The combination unit was northbound on a straight and level section of roadway when it overtook and collided with the left rear of the automobile. On impact, the tractor overrode the left rear of the automobile and the combination unit rolled to the left. The tractor and semitrailer rolled 360° while the second trailer rolled 180°. The truck unit came to rest in a ditch at the east side of the highway facing southeast approximately 329 feet from the initial impact location. The tractor and trailer stopped upright. The second trailer was still coupled and resting on its top. The automobile had traveled in a northeasterly direction after the impact for about 220 feet, rotating about 190° clockwise, and came to rest in the ditch at the east side of the highway.

The tractor sustained extensive damage. Both trailers received minor damage. The tractor was not equipped with restraints. The truckdriver was ejected and received fatal injuries. The automobile received severe damage at its rear, and two of the three occupants sustained minor injuries.

Postaccident inspection of the combination unit revealed the push rod travel on the right rear brake chamber of the semitrailer was 2 1/8 inches. The push rod travel on the forward axle of the second trailer was 2 1/4 inches at both wheels.

The driver's daily logbook showed that he had accumulated 12.5 hours driving in the 24-hour period since his last eight consecutive hours off duty. He had gone on-duty at 9 a.m. on the day of the accident, only 5 hours after going off-duty at 4:30 a.m. In the course of the day, he showed various amounts of short off-duty time. The logbook entries showed that he was off duty in Mettler, California at the time of the accident; the accident occurred

about 70 miles north of that location. The logbook entries were completed through 3 a.m. of the day following the accident. The page for October 31 was missing from the logbook. The investigation revealed that the driver routinely slept only 4 to 5 hours at various times of the day.

The driver had no formal truckdriver training. He had approximately two years of heavy truck experience. He had been involved in one accident and had received one equipment violation citation in the last two years. He had been employed by the motor carrier for about five weeks.

Urine samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the urine sample contained 132 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were tested at the request of the State of California. This screening test indicated that the blood sample contained an unquantified amount of the non-psychoactive component of marijuana (COOH-THC). This screening test result was confirmed by the findings of the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue and marijuana use.

CASE NO.: 20

Investigation No.: NYC-88-H-TR02
Accident Location: Interstate 81, Washington County, Maryland
Lanes: One lane
Shoulders: Right, 9.7 feet; left, 3.7 feet, both asphalt
Median: None
Features: Exit ramp, right curve, 4 percent superelevation
Date and Time: October 5, 1987, 1 a.m.
Ambient Conditions: Clear, dark and dry 50°F
Heavy Truck Involved: 1987 COE Peterbilt tractor in combination with a loaded 46-foot trailer
Motor Carrier: Kohn Transportation, Inc.
Type of Operation: Common Carrier
Size of Operation: 98 power units
Total Weight of Truck: Approximately 71,000 pounds
Total Length of Truck: 59 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was entering a right curving exit ramp onto westbound Interstate 70 when the driver lost control. The unit overturned 90° onto its left side, then slid off the roadway and into an earthen embankment. During the overturn the unrestrained driver was partially ejected through the left door window and was fatally injured. The trailer was fully loaded with 855 bundles of pulpboard.

The speed limit for the roadway was 55 mph; a 45 mph advisory speed sign was in place preceding the ramp. NTSB speed calculations, based on tire sideslip marks, revealed that the critical speed for the curve was 65 mph, and that the truck was traveling at an about 68 mph. Marks in the roadway indicated that the tractor and trailer overturned before it left the paved exit ramp.

The truck driver reportedly had 35 years of experience in heavy vehicle operation, and his current employer had provided him with about 3 hours of training with tractor/trailer units. The driver was familiar with the accident highway. The driver had been awake for at least 18.5 hours prior to the crash.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also analyzed for the State of Maryland. This analysis indicated that the blood sample contained 400 ng/ml of lidocaine.

Washington County, Maryland
Case No. 20

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed of his vehicle on the roadway curvature, possibly due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 21

Investigation No.: NYC-88-H-TR03
Accident Location: Interstate 95, Baltimore County, Maryland
Lanes: 1
Shoulders: Right, 2 feet; left, 10 feet, both asphalt surfaces
Median: None
Features: Exit ramp, right curve
Date and Time: October 23, 1987, 11:15 a.m.
Ambient Conditions: Clear, daylight, dry and 58°F
Heavy Truck Involved: 1984 COE White tractor in combination with a loaded 45-foot trailer
Motor Carrier: Deaton, Inc.
Type of Operation: Common Carrier
Size of Operation: 735 power units
Total Weight of Truck: About 74,500 pounds
Total Length of Truck: 53 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was southbound negotiating a right curving exit ramp, when it overturned, slid off of the roadway, and crashed into a blocked out "W-beam" guardrail. The collision with the guardrail crushed the tractor's roof above the drivers seat and the unrestrained driver was killed. The trailer was fully loaded with 398 sheets of novoply board.

The speed limit for the highway was 50 mph, and a 25 mph advisory speed sign was in place on the right side of the ramp 231 feet beyond the beginning of the curve. NTSB speed estimate calculations, based on the truck s tiremarks, revealed that it was traveling about 38 mph when the accident occurred. Further calculations indicated that the trucks rollover threshold speed was about 33 mph and that the critical speed for the curve was about 42 mph. Marks on the roadway indicated that the unit overturned before it left the paved exit ramp.

The driver had over 2 years of experience driving heavy vehicles and had attended a 6-month professional truckdriving school. The driver was reportedly familiar with the highway on which the crash occurred.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 11 ng/ml of phencyclidine (PCP) and 280 ng/ml of benzoylecognine (metabolite of cocaine). No other drugs, as identified by the NTSB testing protocol, were identified.

Bile samples from the truckdriver were also tested for the State of Maryland. This screen indicated the presence of cocaine metabolites.

Baltimore County, Maryland
Case No. 21

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to his use of PCP and cocaine. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 22

Investigation No.: CHI-88-H-1R02
Accident Location: Highway 36, Moscow, Maryland
Lanes: 2
Shoulders: Asphalt, both about 6 feet wide
Median: None
Features: left curve, ascending grade
Date and Time: October 28, 1987, 3:15 p.m.
Ambient Conditons: Daylight, clear, dry
Heavy Truck Involved: 1975 conventional White tractor in combination with a loaded flatbed trailer
Motor Carrier: Wilhelm Company
Type of Operation: Common Carrier
Size of Operation: 1 tractor
Total Weight of Truck: Approximately 75,733 pounds
Total Length of Truck: Approximately 58 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was negotiating a 1,600-foot radius left curve on a 3 percent ascending roadway when it ran off the right side of the pavement onto the shoulder and began overturning. It rotated 180° counterclockwise on its longitudinal axis and rolled over a guardrail at the outer shoulder edge, then continued rotating a full 360° as it traveled beyond the guardrail onto a negative sloped earthen embankment. The unit came to rest on the embankment, still coupled, resting on its top side. The logs aboard the trailer broke away and were spilled at the guardrail and onto the embankment. A trailing motorist said the unit "just drove off the road." Yawmarks from the unit's right side tires began on the traffic lane pavement and continued onto the right shoulder; gouge marks were identified on the pavement and the southbound shoulder in approach to the guardrail.

The driver, traveling alone, was trapped inside the cab by roof crush and was dead at the scene. The driver's death resulted from blunt chest trauma and mechanical compression and axphyxia.

The 43-year-old driver was experienced in driving combination units and had frequently traveled the accident route. He had gone on duty about 6 a.m. on the morning of the accident when he left home driving the truck unit. He had transported one load of logs that morning, and was on his second trip when the accident occurred. He was not a full-time truckdriver, but worked at various jobs. In addition to driving trucks, he farmed and worked in various logging and sawmill related to the pulpwood industry. His truck driving was confined to a 100-mile radius of his home. He was not making, nor was he required to make, daily driver logs to account for his driving and duty time. The motor carrier was not keeping a time record of the driver and his driving and duty time immediately prior to the accident could not be compu'ed. It was

determined, however, that the driver was working long hours, generally from 6:30 a.m. to 7 or 8 p.m. His normal work day was at least 12 hours, and he routinely worked at other jobs to supplement the family income. On the morning of the accident he had got up earlier than usual.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Maryland with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 23

Investigation No.: ATL-88-H-TR04
Accident Location: I-40, 3 miles west from Old Fort, North Carolina
Lanes: 6 lanes, divided
Shoulders: Asphalt: right, 10 feet - left, 4 feet
Median: Concrete New Jersey type Barrier
Features: Right curve on descending mountainside grade
Date and Time: November 9, 1987, 10:15 a.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1983 COE GMC tractor in combination with a loaded 48-foot trailer
Motor Carrier: A. N. Webber, Inc.
Type of Operation: Common Carrier
Size of Operation: 119 power units
Total Weight of Truck: 48,845 pounds
Total Length of Truck: 61 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was experiencing a mechanical problem when it was pulled into a truck information station at the crest of a mountain. The driver, with the assistance of another truckdriver, attempted unsuccessfully to start the engine of the tractor. An air leak developed under the cab of the tractor when hoses from the assisting tractor were connected to pressurize the disabled tractor's air braking system. (Following the accident the fitting connecting the air service line to the air compressor governor was discovered broken.) When the assisting driver left the station, the tractor was still disabled. About one hour later, the case vehicle driver drove past signs in the information station warning of the 4-mile-long steep downgrade, a 35 mph speed limit for trucks, and advising of the locations of three runaway ramps. Some 1.7 miles into the grade, the combination entered a 2,000-foot-long right curve at a calculated speed of about 75 mph. In the curve, the unit overturned on the roadway and skidded 540 feet on the pavement before impacting a concrete median barrier. The unit continued skidding forward for a short distance with the roof of the tractor and trailer still in contact with the barrier. The unit came to rest 238 feet from the point of initial impact astride the eastbound traffic lanes. Several of the concrete barriers were deflected 17 feet into the westbound traffic lanes. The emergency spring brakes were found in the applied position. However, the adjustment at the slack adjusters of the spring brakes had been turned out and the wheels rolled free. The transmission was found in neutral gear and the retarder switch in the off position.

The entire tractor roof and forward section of the trailer roof were ripped away. The unrestrained truckdriver was ejected and killed.

Old Fort, North Carolina
Case No. 23

The 38-year-old driver had no formal truckdriver training. He had driven heavy trucks for about 6 years and had been employed by the motor carrier for one month. The investigation revealed no previous accident history. He held a valid Wyoming drivers license with no record of convictions. Also, he had a Colorado license that was suspended. The Colorado record revealed three 1985 traffic violations; one of those was a DWI conviction that resulted in the suspension. Additionally, his privilege to drive in Idaho was under suspension for a judgement of failure to appear and pay the penalty for a traffic violation fine; the nature of that violation was not determined. The truckdriver was driving while disqualified by the Federal Motor Carrier Safety Regulations (FMCSR). Part 391.15 of those regulations disqualify an interstate driver when his drivers license, or operating privilege, is under suspension. The truckdriver's employment application to the motor carrier indicated that he held the single valid Wyoming license and that he had no traffic violation convictions during the previous three years. The motor carrier had qualified the driver after making the required FMCSR background check using the information supplied on the employment application. That check verified the valid Wyoming license with no recorded violations but it did not disclose the Colorado and Idaho suspensions.

The investigation revealed that the truckdriver had began the accident trip at 7:45 a.m. on the morning before the accident. He had driver 512 miles up to 7 p.m., then went off-duty for 6 1/2 hours--6 hours were spent in the sleeper berth of the tractor. He went back on-duty at 1:30 a.m. on the day of the accident. The record reflected 3 hours off-duty between 1:30 a.m. and 10:15 a.m. (the accident time). He had been stopped on the mountain crest, attempting to repair the truck, for an undetermined period of time. Although there were no witnesses to the accident, a passerby that saw the driver stopped at the mountain crest stated that the driver "looked pale, tired, and possibly under stress."

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB protocol, were identified.

Blood samples were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's decision to proceed on the downgrade with known braking deficiencies. Contributing to the accident was the driver's impairment due to fatigue.

CASE NO.: 24

Investigation No.: LAX-88-H-1R07
Accident Location: Connector road from eastbound SR-91 to northbound I-710, Long Beach, California
Lanes: 2
Shoulders: Right shoulder - 10 feet of asphalt
Median: 5 feet asphalt with a "W-beam" guardrail
Features: At grade, descending grade, left curve
Date and Time: November 9, 1987, 10:25 a.m.
Ambient Conditions: Clear, daylight, dry, 70°F
Heavy Truck Involved: 1975 COE International tractor in combination with a loaded 46-foot trailer
Motor Carrier: Interstate Consolidation
Type of Operation: Common Carrier
Size of Operation: 85 power units
Total Weight of Truck: 62,366 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was eastbound in the right lane negotiating a 443-foot radius left curve on a 4 percent descending grade, at a witness estimated speed of 60 mph, when it moved to the left lane then suddenly veered right. It crossed the right traffic lane and shoulder then struck a double beam guardrail aligning the outer shoulder. The vehicle continued forward along the guardrail, overturned, jackknifed, and slid forward to where it stopped against an overpass concrete support beam. The jackknifed trailer blocked both traffic lanes and fuel spilled onto the roadway. The tractor crushed against the concrete support beam--the driver was trapped inside the cab and was killed by impact injuries. A engine fire erupted but was extinguished immediately by passersby.

The tractor was totally destroyed above its frame rail. The cab section was torn apart. The 45-foot container loaded on the trailer sustained major damage. The trailer was not damaged. The cab remains were inspected for available restraints, but none were found.

A review of the driver's job application received from the carrier revealed that his only prior experience was driving straight trucks. Additionally, the application shows that he was a truck driver in Bronx, New York, with a Class 1 drivers license. He also listed his California Class One license as a license held during the last three years. A California DMV check revealed that he acquired his California Class 1 license on 7-14-86. Based upon the application, the driver had about 16 months of heavy truck driving experience. His formal training as a truck driver could not be determined. According to his pastor, he arrived in the United States about three years ago from El Salvador where he learned to drive trucks. He had been employed by the motor carrier for about four months. His California record revealed four

traffic violations and one accident between 12-04-86 and 06-03-87. All violations were infractions. A 50-state check did not show other licenses held by the driver. There was no record of the driver on the National Driver Register.

Examination of the tractor and trailer by the California Highway Patrol Commercial Vehicle section found the left side brake on axle number two, and both brakes on axle number five, to be out of adjustment. The unit had 30 percent of the available brakes out of adjustment. Twenty percent is required to place a vehicle out of service.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of Los Angeles County with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed for his vehicle and load on the roadway curvature. Driver inexperience may have contributed to the accident.

CASE NO.: 25

Investigation No.: CHI-88-H-TR03
Accident Location: U. S. Highway 45 near Eden, Wisconsin
Lanes: 2 lanes
Shoulders: 9-foot wide gravel shoulders on both sides
Median: None
Features: Straight, 5 percent downgrade
Date and Time: November 23, 1987, 11:25 a.m.
Ambient Conditions: Clear, daylight, dry
Heavy Truck Involved: Loaded 1976 GMC truck
Motor Carrier: Mueller Livestock Trucking
Type of Operation: Common carrier
Size of Operation: 3 trucks
Total Weight of Truck: About 16,000 pounds
Total Length of Truck: 27 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The truck was traveling south at a witness estimated speed of about 30 mph when the witness saw the driver slumped forward over the steering wheel. The truck gradually veered to the left, crossed the opposing traffic lane and shoulder, and ran off the roadway. It traveled about 190 feet through a site graded drainage ditch then began traveling down an embankment. While on the embankment it overturned onto its roof and stopped.

The truck received moderate damage to the right side and roof. The unrestrained driver remained inside the vehicle and was dead when enforcement officers arrived at the site a short time later.

A postcrash inspection of the truck revealed it to be in good repair with no defects or deficiencies noted.

The driver held valid chauffeur and regular Wisconsin drivers' license. His Wisconsin driving record revealed no accident history or traffic violations. The truck was being operated in a small father-son trucking operation; the driver was the father. He had no formal truckdriver training but had been driving farm trucks for 51 years. The carrier maintained no records on the driver or its trucks.

The coroner's report stated that the driver's death resulted from a sudden heart attack and arterial sclerotic heart disease. The coroner stated he found no external injuries on the driver's body and believed the driver was dead before the accident occurred.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained salicylate (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified.

Eden, Wisconsin
Case No. 25

Blood samples from the driver were also tested at the request of the State of Wisconsin with negative results. However, the Wisconsin laboratory tested for alcohol only, which would not identify the analgesic found by the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Boards determines that the probable cause of this accident was physical incapacitation of the driver due to cardiac failure.

CASE NO.: 26

Investigation No.: NYC-88-H-TR05
Accident Location: Muncaster Mill Road, Montgomery County, Maryland
Lanes: 2
Shoulders: Right, 1.5 feet; left, 3 feet, both asphalt
Median: None
Features: Right curve, at grade
Date and Time: November 28, 1987, 9:30 a.m.
Ambient Conditions: Daylight, raining, wet, about 35°F
Heavy Truck Involved: Loaded 1984 Iveco truck
Motor Carrier: AC+R Insulation Co., Inc.
Type of Operation: Private Carrier
Size of Operation: 35 trucks
Total Weight of Truck: About 11,900 pounds
Total Length of Truck: 20 feet
Other Vehicle Involved: 1984 Ford truck
Truck Fatalities: 1 Truck Injuries: 3
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The westbound Iveco truck was negotiating a right curve when it crossed the centerline and collided head-on with the eastbound Ford truck. The unrestrained Iveco driver, traveling alone, was killed. The three Ford occupants received minor injuries. The Iveco truck was partially loaded with insulation material. The speed limit for the highway was 40 mph, and a 25 mph advisory speed sign was in place for westbound traffic preceding the accident curve. Safety Board calculations indicated that the critical speed range for this curve, with a wet road surface, was between 39 and 43 mph.

The Iveco driver was a professional insulation installer, and he drove the accident truck incidental to his employment. The driver had not received formal truckdriver training. He was reportedly familiar with the highway on which the crash occurred. The driver possessed a valid Maryland operators license, however, he also had a suspended Virginia license.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 88 ng/ml of benzoylecgonine (metabolite of cocaine) and 5.9 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood and urine samples from the truckdriver were also tested at the request of the State of Maryland. These screening tests indicated that the urine sample contained unquantified amounts of phencyclidine, cocaine, and cocaine metabolites. The blood sample test was negative, but did not include a test for marijuana or the metabolites of cocaine.

The Maryland laboratory urine drug screen that showed a positive for cocaine and cocaine metabolites was confirmed by the Center for Human

CASE NO.: 26

Investigation No.: NYC-88-H-TR05
Accident Location: Muncaster Mill Road, Montgomery County, Maryland
Lanes: 2
Shoulders: Right, 1.5 feet; left, 3 feet, both asphalt
Median: None
Features: Right curve, at grade
Date and Time: November 28, 1987, 9:30 a.m.
Ambient Conditions: Daylight, raining, wet, about 35°F
Heavy Truck Involved: Loaded 1984 Iveco truck
Motor Carrier: AC+R Insulation Co., Inc.
Type of Operation: Private Carrier
Size of Operation: 35 trucks
Total Weight of Truck: About 11,000 pounds
Total Length of Truck: 20 feet
Other Vehicle Involved: 1984 Ford truck
Truck Fatalities: 1 Truck Injuries: 3
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The westbound Iveco truck was negotiating a right curve when it crossed the centerline and collided head-on with the eastbound Ford truck. The unrestrained Iveco driver, traveling alone, was killed. The three Ford occupants received minor injuries. The Iveco truck was partially loaded with insulation material. The speed limit for the highway was 40 mph, and a 25 mph advisory speed sign was in place for westbound traffic preceding the accident curve. Safety Board calculations indicated that the critical speed range for this curve, with a wet road surface, was between 39 and 43 mph.

The Iveco driver was a professional insulation installer, and he drove the accident truck incidental to his employment. The driver had not received formal truckdriver training. He was reportedly familiar with the highway on which the crash occurred. The driver possessed a valid Maryland operators license, however, he also had a suspended Virginia license.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 88 ng/ml of benzoylecgonine (metabolite of cocaine) and 5.9 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood and urine samples from the truckdriver were also tested at the request of the State of Maryland. These screening tests indicated that the urine sample contained unquantified amounts of phencyclidine, cocaine, and cocaine metabolites. The blood sample test was negative, but did not include a test for marijuana or the metabolites of cocaine.

The Maryland laboratory urine drug screen that showed a positive for cocaine and cocaine metabolites was confirmed by the Center for Human

Toxicology measurements. The urine phencyclidine positive result was not confirmed by the Center for Human Toxicology blood tests, from which it can be concluded that the amount of phencyclidine in the blood sample was below the testing cut-off used by CHT.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was Iveco driver's misjudgement of a safe operating speed for his vehicle for the roadway conditions. Possibly contributing to the accident was the driver's impairment due to his use of cocaine and marijuana.

CASE NO.: 27

Investigation No: MKC-88-H-1R02
Accident Location: Interstate 5, in Los Angeles, California
Lanes: 8, divided
Shoulders: Left 7.5 feet, right 8 feet, asphalt surface
Median: Concrete barrier with chain link glare fence
Features: straight, at grade
Date and Time: December 3, 1987, 4:15 a.m.
Ambient Conditions: Darkness, clear, no artificial lighting
Heavy Truck Involved: 1984 COE International tractor in combination with two 28-foot trailers; first trailer loaded, second trailer empty
Motor Carrier: Connell West Trucking
Type of Operation: Common and Contract Carrier
Size of Operation: 7 tractors
Total Weight of Truck: 50,000 pounds
Total Length of Truck: 68 feet
Other Vehicles Involved: 1974 Chevrolet automobile, 1975 White combination unit

Truck Fatalities:	1	Truck Injuries:	1
Other Fatalities:	0	Other Injuries:	0

FACTUAL SUMMARY:

The International combination unit was southbound in the second of four traffic lanes traveling at a witness estimated speed of 70 mph and passing the White and two Peterbilt combination units that were traveling in lanes three and four. When the International unit was about three truck lengths ahead of the other three truck units it swerved to the right, crossed traffic lanes three and four ahead of the other trucks, and crashed into the Chevrolet automobile that was parked on the right shoulder. The International unit continued forward from the automobile impact, traveled about 57 feet against a guardrail at the outer shoulder, then impacted a concrete pillar of a bridge overpass. Following the bridge impact, the International unit rotated right around the pillar and both trailers broke free from their coupling. The second trailer traveled 132 feet southerly, blocked the right traffic lane, and was struck by the oncoming White unit. The two Peterbilt units continued by the location and were not involved in the accident.

The International tractor was broken into three sections; the cab was torn from the chassis. It was separated at the bottom of the windshield and the top of the cab was displaced rearward. The steering axle, engine and transmission were separated from the chassis. The semitrailer originally coupled to the International was severed behind the kingpin plate and the front of that vehicle was still attached to the tractor. The second trailer sustained only moderate damage when it was struck by the White unit. The International driver was fatally injured and a passenger who was in its sleeper berth was seriously injured. Due to the extensive damage to the tractor, it was not possible to determine if the fatally injured driver was restrained. The occupants of the other involved vehicles were not injured.

Los Angeles, California
Case No. 27

According to the motor carrier, the fatally injured driver had been driving commercial vehicles for 30 years and had 5 years experience driving double trailers. However, he had no formal truckdriver training. He had driven for the carrier for 5 years and had received three speeding citations in the last three years, but had no suspensions or accidents. His drivers license was restricted to wearing corrective lenses.

There was 178 feet of "W-beam" guardrail on the right shoulder. It began 72 feet prior to the involved bridge overpass. It was mounted on 8 inch by 8 inch wooden posts, and was installed 26 to 30 inches above the travel surface. This design deflects almost three feet. It was blocked out from the bridge pillar by an 8 inch by 8 inch block. The 1984 International tractor struck the guardrail, just after the approach ended, and continued along the rail until the tractor engaged the bridge pillar.

The investigation revealed that the truckdriver worked a regular schedule. He would leave Los Angeles at 9 p.m., arrive in Sacramento at 6 a.m., sleep for some period of time during the day, then depart on the return to Los Angeles at 6 to 7 p.m. The accident occurred one day after the driver had been off for 3 days. Consequently, sleep cycle disruption may have contributed to the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the fatally injured truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the incapacitation of the truckdriver due to fatigue.

CASE NO.: 28

Investigation No.: DEN-88-H-TR03
Accident Location: Interstate 5, 2 miles south of Westley, California
Lanes: 4, divided
Shoulders: Right, 9 feet asphalt; left, 2 feet asphalt
Median: 60-feet-wide earthen, grassed
Features: Straight, level
Date and Time: December 4, 1987 at 8:25 a.m.
Ambient Conditions: Daylight, cloudy, dry, 50°F
Heavy Truck Involved: 1988 Peterbilt tractor in combination with a loaded 48-foot trailer
Motor Carrier: Prime, Inc.
Type of Operation: Common Carrier
Size of Operation: 339 power units
Total Weight of Truck: 67,645 pounds
Total Length of Truck: 67 feet
Other Vehicle Involved: 1984 Freightliner tractor in combination with a loaded 48-foot trailer
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The northbound Peterbilt combination unit was reportedly weaving between the two traffic lanes while traveling at witness estimated speed in excess of 65 mph. The witnesses advised that they talked to the weaving driver by radio, and tried to get him to pull over and stop when he told them that he was tired. About 2 miles farther, the Peterbilt unit ran off the traffic lanes onto the right shoulder, struck the back of a the parked and unattended White combination unit, and caught fire. After impact both vehicles remained together and slid forward for 120 feet. The parked unit was 8 to 10 feet away from the right traffic lane, its four-way emergency flashers were blinking, and three orange colored triangle-shaped reflectors were on the ground behind the truck. Motorists who stopped were unsuccessful in getting the driver out of the burning Peterbilt and he died at the site.

The parked unit that was struck was not involved in the fire but received substantial damage to the rear of its trailer. The Peterbilt cab was destroyed by the postcrash fire and the front of its trailer received substantial fire damage. Postcrash examination of the vehicle revealed that the tractor was a 1988 model which had been in service for about a month and had accumulated about 24,000 miles. Except for burn damage, no defects were noted with its brakes, tires, and steering components.

The fatally injured Peterbilt driver's employment history revealed that he had been driving heavy trucks for the previous six years. He had received no formal truckdriver trainirg; he was taught to drive trucks by his father who was a truckdriver.

Westley, California
Case No. 28

From interviews of the company dispatcher, shippers, relatives, and dock personnel, the driver's activities were traced from the accident time back to 0745 hours MST on Friday, November 27, 1987. The activities revealed that the solo driver had driven 3,824 miles in the last seven days, and had, in some cases, helped load and unload his shipments. The driver's activities for the 24 hours showed he called his company on Thursday, December 3, 1987, at 0700 hours MST, from Albuquerque, New Mexico. That night, at 2110 hours PST, the driver was issued a citation by the California Highway Patrol just outside of Needles, California. Eleven hours and 15 minutes later on Friday, December 4, 1987, at 0825 hours PST, the driver had his accident, near Westley. The California speed limit for three axles vehicles was 55 mph. The California Highway Patrol advised that it was a 13 to 15 hour drive for loaded trucks from the ticket location to the accident site. Except for the last 24 hours prior to the accident, the driver's actual duty and driving times could not be substantiated as his driving log book was destroyed in the accident fire.

Prime, Inc. was the motor carrier, however, the driver was employed by Luna Trucking, and the accident truck door markings were to Ark-Cal Trucking in Fort Smith, Arkansas. Luna Trucking was established in November 1987 after its owner, Charles Luna, cancelled a leasing contract with Ark-Cal when they filed for bankruptcy in November 1987. With Ark-Cal, Mr. Luna leased 54 trucks and trailers from an investor's position. On November 9, 1987, Mr. Luna signed a contract with Prime Inc. to use their ICC authority. The contract called for Luna Trucking to provide their own drivers and to obtain their own freight/cargo loads. Mr. Luna advised that he used some of the drivers that drove for Ark-Cal without knowing their backgrounds. Also, he had not had time to change the door markings to Prime Inc. Mr. Luna stated during an interview with the NTSB investigator that he was not knowledgeable of the Federal Motor Carrier Safety Regulations. Prime, Inc. was an established trucking company that has a satisfactory rating from the Office of Motor Carrier issued on March 9, 1987.

The Arkansas Motor Vehicle Department, Driver Control Section records, on the 25-year-old driver, showed his present driving privileges as suspended for failure to pay speeding tickets in Texas and Tennessee. The records from October 27, 1979, to present include 11 suspensions, 6 driving while intoxicated (DWI) convictions--the latest one being March 7, 1987, 9 speeding violations, 5 driving while suspended citations, 1 reckless driving conviction, 1 red light violation, 1 driving too fast for conditions, and 2 accidents. The driver also held a New Mexico class 08 truck license that expired 8-24-90. The New Mexico records showed no violations on the license. There was no NDR record on the driver.

The Safety Board calculations based on physical evidence at the scene estimated the truck's speed at approximately 63 mph when it struck the back of the parked truck.

Westley, California
Case No. 28

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 990 ng/ml of amphetamine, 300 ng/ml of methamphetamine, 57 ng/ml of benzoylecgonine (metabolite of cocaine), 22 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 35 percent saturation of carbon monoxide (CO). No other drugs, as identified by the NTSB testing protocol, were identified.

In addition, a syringe found in the tractor cab debris was also sent to CHT for drug identification. The CHT analysis found that the syringe contained methamphetamine and amphetamine.

Blood samples were also tested at the request of the State of California. This test indicated a 24.8 percent saturation of carbon monoxide.

The California laboratory screened the blood specimen only for carbon monoxide (COHb), ethanol (alcohol), and barbituates. The 24.8 percent saturation found by California in in resonable agreement with the 35 percent saturation reported by the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue and his use of methamphetamine and/or amphetamine, cocaine, and marijuana.

CASE NO.: 29

Investigation No.: SEA-88-H-TR05
Accident Location: S.R. 99, Stockton, California
Lanes: 4 lanes, divided
Shoulders: Right, 18 feet; left, 1.3 feet, both asphalt
Median: 107 feet of dirt and bushes
Features: Underpass, 1240-foot curve, 4 percent downgrade
Date and Time: December 4, 1987, 2:25 p.m.
Ambient Conditions: Raining and daylight
Heavy Truck Involved: 1974 International COE tractor in combination with an empty 45-foot trailer
Motor Carrier: Knoll Transportation
Type of Operation: Common Carrier
Size of Operation: 6 power units
Total Weight of Truck: 25,090 pounds
Total Length of Truck: 64 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The tractor and empty trailer combination was traveling down a 4 percent grade in a 1,240-foot radius curve to the left on a rain-soaked asphalt roadway when the vehicle moved to the left and struck the concrete support pillars for an overcrossing on the median side of the road. The tractor cab was separated from the chassis at impact and came to rest upside down in the median lane near the last of three support pillars. Both the tractor chassis and the trailer continued down the roadway and came to rest about 80 feet past the center support pillar, with the tractor chassis in the median lane and the trailer across both lanes of travel. The tractor chassis had jackknifed, rotating about 310° counterclockwise into the trailer, while the trailer rotated about 120° counterclockwise. The only tiremarks found at the scene were a set of dual marks, 65 feet in length, located in the median lane just before the curve, about 360 feet before the overcrossing near the exit lane.

The impact destroyed the tractor, bending the frame severely, with the rear sections displaced to the right. The cab of the tractor had most of its right side torn away. The front 10.5 feet of the trailer was damaged extensively, bent to the left, and barely attached to the tractor's fifth wheel. The unrestrained driver was ejected and found about 20 feet past the detached cab, laying on the median shoulder just inside the fogline. He was transported to a local hospital where he was pronounced dead.

The last entry in the driver's log book was 25 hours before the accident. When a check was made comparing the log entries with phone calls he made to his wife, statements to warehouse employees accepting his deliveries, and fuel receipts, several discrepancies were found. Since the log book was suspect, it could not be determined whether he was driving within the requirements for hours of service.

Stockton, California
Case No. 29

A 19-inch high guardrail had been installed in front of the concrete support pillars. AASHTO recommends that these be installed at 27 inches. The bottoms of bumpers on most heavy trucks are located about 16 inches above the ground and the tops are usually about 32 inches. This guardrail was severely deformed in between the concrete pillars on which it was mounted.

Three out of four brakes on the trailer were out of adjustment according to measurements made by the California Highway Patrol. The lower brake lining on the left side of the drive axle was worn down to the rivets. A bent tie rod and tire wear on the inside of the left steering tire were also noted.

The outside lane of the three southbound lanes drops off as an exit lane right before the curve begins. The NTSB investigator observed several vehicles switching lanes in order to avoid being forced to exit. The signing for this lane drop consists of one "EXIT ONLY" sign at 1003 feet from the exit and three "THRU TRAFFIC MERGE LEFT" signs located at 475 feet, 1056 feet, and 2270 feet from the exit.

The truckdriver had 11 to 12 years experience driving heavy trucks, had no formal training, and was familiar with the route. He possessed a valid California Class 1 operator's license--his driving record for the past four years showed three moving violations, four safety regulation violations, and no accidents.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were also conducted by the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's loss of control on the wet roadway for unknown reasons.

CASE NO.: 30

Investigation No.: LAX-88-H-TR08
Accident Location: State Route 43 at Garces Highway, Delano, California
Lanes: Two
Shoulders: Six foot asphalt/dirt all sides
Median: None
Features: Level, straight, slightly elevated above ground for flood control
Date and Time: December 9, 1987, 8:20 a.m.
Ambient Conditions: Daylight, dense patchy fog, dry road
Heavy Truck Involved: 1984 Freightliner 3-axle conventional with a side dump box in combination with a 24-foot fully loaded side dump trailer
Motor Carrier: Payne-Allied Trucking
Type of Operation: Private Carrier
Size of Operation: 32 power units
Total Weight of Truck: 74,960 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 1973 White 3-axle cattle truck in combination with an empty 25-foot cattle trailer

Truck Fatalities:	1	Truck Injuries:	0
Other Fatalities:	0	Other Injuries:	1

FACTUAL SUMMARY:

The Freightliner was eastbound on Garces Highway when it crossed a grade crossing and approached the arterial stop sign at the intersection with State Route 43. There were no uninvolved witnesses to the precrash events, but the driver of the White truck related that the Freightliner appeared to have stopped for the arterial stop sign at the intersection and then proceeded into the intersection at a slow speed. There was very dense, patchy fog at the time of the collision, with visibility restricted to approximately 450 feet. The White truck driver, traveling at a driver-reported speed of 50-55 mph, reported seeing the Freightliner enter the intersection directly across his path of travel. The White truck driver related that he immediately applied his brakes. Evidence on scene showed approximately 208 feet of locked wheel skidmarks emanating from the rear wheels of his trailer.

The White truck impacted the Freightliner at the right door, separating the front of the truck from the rear of the truck at a point just aft of the rear of the cab. The vehicles traveled in tandem in a northeasterly direction for an additional 42 feet. The cab of the Freightliner rotated approximately 225° in a clockwise direction and rolled 90° onto its right side. Both the rear of the Freightliner and the White truck jackknifed before coming to rest.

The Freightliner sustained total damage to the separated cab area. There was severe distortion to the right side of the rear portion of the truck and severe bending of the drawbar assembly between the rear of the truck and the pull trailer. The White truck sustained total damage to the cab and severe burn damage to the adjacent portion of the truck. There was minor damage to

Delano, California
Case No. 30

the trailer. Passersby's were able to extricate the White truck driver from his unit immediately postcrash. As they were attempting to rescue the Freightliner driver, they withdrew as an explosion occurred and the vehicles caught on fire. There was insufficient evidence remaining after the fire to determine its source. The Freightliner driver sustained fatal head and abdominal injuries. The White driver received moderate injuries.

A subsequent investigation by the Safety Board indicated that there were no mechanical factors contributing to this collision. The Freightliner driver had worked for this company for more than 15 years, had a safe driving record, and had no apparent physical impairments. He had driven in this geographical area for his entire career, and was very familiar with the fog characteristics. Both vehicles were examined postcrash and no contributing deficiencies were detected. The skidmarks left by the White truck are consistent with the reported visibility limitations and the driver's reported speed. Although the other vehicle driver reported that his headlights were on, this does not appreciably increase visibility in this type of fog. The White driver stated that he was aware of the fog but did not reduce his speed below the posted maximum limit.

Blood samples from the Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained salicylate (aspirin) and a 32 percent saturation of carbon monoxide (CO). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also analyzed at the request of the Kern Count Coroner's Office. This analysis indicated that the blood sample contained a 26.5 percent saturation of carbon monoxide.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Freightliner driver's failure to yield at the stop sign controlled intersection, probably due to the reduced visibility from the dense fog.

CASE NO.: 31

Investigation No.: FTW-88-H-TR02
Accident Location: California State Route 99, 5.6 miles south of Bakersfield, California
Lanes: 4 lanes, divided highway
Shoulders: 8 foot wide asphalt shoulder
Median: 70-foot wide earthen median with Oleander bushes
Features: Straight and level
Date and Time: December 11, 1987, 5:50 a.m.
Ambient Conditions: Cloudy, dry, and dark
Heavy Truck Involved: 1976 Freightliner COE tractor in combination with two loaded 24-foot trailers
Motor Carrier: American Transfer Company
Type of Operation: Contract carrier
Size of Operation: 95 power units
Total Weight of Truck: 69,380 pounds
Total Length of Truck: 62 feet
Other Vehicle Involved: 1986 Freightliner COE tractor in combination with two loaded 24-foot trailers
Truck Fatalities: 1 Truck Injuries: 1
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1986 Freightliner combination vehicle was southbound on California State Route 99, in the lane nearest the shoulder, at a driver estimated speed of 58 mph. At this time, the 1976 Freightliner combination vehicle was southbound in the lane nearest the median, approaching the other combination unit at a witness estimated speed of 60-65 mph. The 1986 Freightliner turned into the median lane to pass a slower moving vehicle and collided with the 1976 Freightliner. At the initial impact, the right front and side of the 1976 Freightliner came into contact with the left rear side of the Peerless trailer being pulled by the 1986 Freightliner. The 1976 Freightliner unit then swerved to the left, departed the travel surface at an approximate 30° angle, and skidded approximately 150 feet in the soft median material before overturning on the Oleander shrub divider. The tractor and semi-trailer combination then slid about 90 feet on its left side, coming to rest on the west roadway edge of the northbound lanes. The trailer of this combination separated from the semi-trailer and came to rest in the Oleander divider. The witness stated that when the 1986 Freightliner combination unit began its lane change maneuver, the other Freightliner was about 300 feet to the rear.

The witness also added that the truck changing lanes had its turn signal on and, when the impact occurred, the right rear of the trailer on the unit changing lanes had not yet crossed the center lane markers. There was a steering axle tire mark in the lane nearest the median, located approximately 4.5 feet east of the center lane markers. The witness added that he thought the truck made a safe lane change. According to the California Highway Patrol, this witness and the truckdriver that was changing lanes were friends.

Bakersfield, CA.
Case No. 31

The 1976 Freightliner combination unit sustained extensive damage and the driver was killed. The forward structure of the cab roof was crushed downward into the driver's seating area and the driver was entrapped within. The left rear of the Peerless trailer being pulled by the 1986 Freightliner sustained minor damage and the driver received minor injuries.

An autopsy, conducted by the Kern County Coroner's office showed that the driver of the 1976 Freightliner had not sustained any lethal injuries in the accident. He died from cardiogenic shock that resulted from a myocardial infarction which had begun 24-48 hours before the accident. He died at the scene of the accident.

The investigation confirmed that this driver had experienced a previous heart attack on 10/31/87. The driver was hospitalized until 11/06/87 and did not return to work until 11/16/87. The driver's last medical certificate exam was on 8/28/87. The certificate showed that the driver was being treated for high blood pressure, but it was under control at the time of the exam. However, the motor carrier did not require the driver to obtain another DOT physical following his heart attack. Moreover, according to the driver's wife, the doctor that treated the driver for his heart attack advised him to stop driving a truck.

The Safety Board was able to partially reconstruct the driver's hours of service by reviewing the drivers log books and through information provided by the carrier. the driver's wife, and the shipper. Following his heart attack and convalescence, the driver worked 16 days before the accident. During this time, he averaged working 11 hours a day. On the day before the accident the driver departed Fresno at 6 a.m. and drove to Huntington Park, a suburb of Los Angeles. The driver arrived at his destination at 1 p.m., but he was unable to unload because of a delay at the docks. The 1 p.m. entry on the driver's logs was his last recorded entry of duty status. Officials at the off-loading site stated that the driver was able to begin unloading at 4:30 pm and he finished at 6 p.m. The driver's duty status or location from 1-4:30 pm was not discovered. It required 5 hours of driving time for the driver to make the trip to Huntington Park. It was estimated that he arrived back in Fresno between 11 p.m. and midnight. The driver did not travel home after work. According to the carrier operations manager, he probably slept in his truck at the motor carrier's terminal.

At about 4 a.m. on the following morning, after having worked 14-15 hours in the preceding 24 hours and being off duty for only about 4 hours, the driver departed on the accident trip. He drove approximately 100 miles, and the accident occurred at 5:50 a.m.

Information provided by the motor carrier showed that the driver had been operating heavy commercial vehicles for 40 years. The carrier's records showed that the driver had no convictions for traffic violations, but a check of his state driving record showed that he had been convicted of 4 moving violations in the preceding 2 years and had been arrested for another violation. All of these violations occurred while the driver was operating a heavy truck.

Bakersfield, CA.
Case No. 31

Employment records on the driver of the 1986 Freightliner showed that he had been operating heavy commercial vehicles for the past 3 years. In response to questions on the employment application about prior suspensions and DUI charges, the driver answered that he had none. However, the Safety Board discovered that he had been convicted of 6 traffic violations, 1 DUI charge, and had his license suspended 2 times. Approximately one week prior to this accident, this driver was arrested for DUI in Oregon. As a result of this offense, the driver's license was again suspended, but the suspension did not take effect until 1/4/88.

The 1986 Freightliner driver's employer furnished the Safety Board with documents that showed he conducted a background check on the driver, but his previous employers failed to mention the driver's poor driving record. When the carrier ordered a copy of the driver's state record, he mistakenly ordered an abstract which only showed the valid status of the drivers license and did not show the complete record. The Safety Board learned from Driver License officials in Oregon that in order to obtain the complete record, an employer must specify that he wants a court print when ordering the record.

Blood samples from the driver of the 1976 Freightliner were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood and urine samples from the fatally injured truckdriver were also tested at the request of the State of California. While the blood test was negative, the urine sample was positive for an unquantified amount of diltiazem, a coronary artery dilator.

Both blood and urine was screened for drugs by the California laboratory. The urine was positive for diltiazem. The blood was negative, i.e. below the cut-off for testing. The Center for Human Toxicology screened the blood only, and found the blood negative for drugs as well.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the incapacitation of the 1976 Freightliner driver due to fatigue and an ongoing cardiac failure. Possibly contributing to the driver's failure to survive the accident was the inadequate cab structure of the power unit.

CASE NO.: 32

Investigation No.: SEA-88-H-TR06
Accident Location: California Route 99, Visalia, California
Lanes: 4 lanes, divided
Shoulders: Right, 8 feet, asphalt
Left, 19.7 feet, dirt and gravel
Median: Concrete divider, 30 inches high
Features: Slight curve, slight downgrade
Date and Time: December 12, 1987, 12:15 a.m.
Ambient Conditions: Darkness, street light at interchange, roadway dry, no adverse conditions
Heavy Truck Involved: 1985 Freightliner COE in combination with two 28-foot van trailers
Motor Carrier: Con-way Western Express
Type of Operations: Common Carrier
Size of Operation: 195 power units
Total Weight of Truck: 35,500 pounds
Total Length of Truck: 68 feet
Other Vehicle Involved: 1972 Diamond-Reo conventional in combination with a 40-foot flatbed trailer

Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 0

FACTUAL SUMMARY:

This accident occurred as a 1985 Freightliner pulling two partially loaded 28 foot "van type" trailers was traveling south in the slow lane of California Route 99. The combination came up behind the slow moving 1972 Diamond-Reo pulling a 40-foot flatbed trailer load with Christmas trees, did not evade, and struck it in the rear. The flatbed trailer hauling the trees broke away from the tractor and came to rest upright in the passing lane facing south, approximately 550 feet south of the point of impact. The driver was able to steer the Diamond-Reo tractor onto a nearby exit ramp. The Freightliner tractor veered to the left and struck the concrete median. The tractor and first trailer both overturned on the right side and came to rest approximately 250 feet south from the point of impact. The cab of the tractor separated from the chassis and came to rest on the east side of the concrete median divider. The second trailer separated from the first trailer and came to rest upright, behind the first trailer, and approximately 225 feet south of the point of impact.

The Freightliner driver was wearing a lap belt. This was confirmed by police and emergency medical personnel at the scene. The cause of death was reported by the pathologist to be "exsanguination (hemorrhaging) due to multiple traumatic abdominal injuries."

The Freightliner driver did not have formal training in truck driving, but his father, also a truckdriver, taught him to drive. For the past 3.5 years, the driver had driven COE (cab-over-engine) tractors in combination

with double trailers. He had been a truckdriver for 17 years and had driven various configurations. Conway Western Express has a 10 week driver training course for new drivers.

When making a postcrash examination of the 1985 Freightliner, the cab was found to be heavily damaged in the front and completely separated from the chassis. The left wheelbase measured 79 inches, shortened from its original length of 122 inches. The right wheelbase measured 102 inches. There was heavy structural damage to the tractor to include broken springs, a displaced engine, a bend in the main frame, and both the transmission and right fuel tank were totally separated from the chassis. The first trailer had the roof ripped open, dents on the roof, and a bent landing gear cross member. The second trailer had only a minor dent on the right front corner.

An examination of the 1972 Diamond-Reo revealed a cracked bell housing and a displaced rear differential. The tractor had an auxiliary weight bearing axle, commonly referred to as a "Joe Dog." This is attached to the main tractor 5th wheel and located directly behind the drive axle, thus giving it the appearance and the weight hauling limits of a tandem axle tractor. The kingpin on the "Joe Dog" was sheared off. The trailer sustained heavy rear end damage. The trailer 5th wheel plate was cracked and the kingpin was bent rearward.

A records check with the State of California for the Freightliner driver revealed that during the past 3 years, the driver has had 3 moving violations and 3 accidents. The accidents and violations were not related. There was no record of his license being suspended or revoked. It should be noted that Conway Western Express has periodic employee drug screening. On June 26, 1987, he was tested for 8 different drugs, including amphetamines, and all of them tested negative.

A records check with the State of Oregon for the Diamond Reo driver revealed no accidents or violations in the past 3 years.

Blood samples from the Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 160 ng/ml of methamphetamine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Freightliner driver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 277 ng/ml of methamphetamine.

The laboratory used by California determined the methamphetamine concentration in the blood by thin layer chromatography (TLC). This methodology is subject to greater measurement error than gas chromatography/mass spectrometry. Consequently, the Center for Human Toxicology reported blood concentration of 160 ng/ml methamphetamine is expected to be more accurate.

Visalia, California
Case No. 32

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Freightliner driver due to his use of methamphetamine. Contributing to the accident was the poor conspicuity of the flatbed trailer. Contributing to the severity of the accident was the inadequate cab structure of the Freightliner.

CASE NO.: 33

Investigation No.: DEN-88-H-TR04
Accident Location: State Route 17, 7 miles North of Santa Cruz, California
Lanes: 4-lanes, divided
Shoulders: 8-foot wide, asphalt
Median: earthen varying width
Features: Left curve, 500-foot radius, 4 percent downgrade
Date and Time: December 14, 1987, 7:41 a.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1977 Peterbilt tractor in combination with a loaded 30-foot end dump trailer
Motor Carrier: Clark Trucking Company
Type of Operation: Common Carrier
Size of Operation: 6 power units
Total Weight of Truck: 78,860 pounds
Total Length of Truck: 49 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Peterbilt tractor pulling a 30-foot end dump trailer loaded with sand was traveling north, traversing a descending left curve with a 500-foot radius. This was in a 40 mph posted speed limit for trucks. A witness stated that the vehicle was traveling about 55 to 60 mph when it passed two other gravel trucks. The vehicle then made a sharp lane change maneuver into the right lane, at which time the vehicle went out of control. The vehicle left visible tire and scuff marks for 503 feet to a point where it struck and damaged the guardrail along the east edge of the road. Approximately 39 feet north of this point, there were large scrape and gouge marks in the pavement along the left shoulder. These marks corroborated the witness statement as to where the truck rolled onto its right side.

The vehicle then slid across a private drive and into another guardrail. The vehicle came to rest along the east shoulder and ditch 237 feet 7 inches from the first gouge marks in the road.

The tractor came to rest on its right side, facing in a northwesterly direction, with the right front wheel 18 inches west of the east edge of the east stripe and its right #3 axle wheel 9 feet 10 inches east of the east edge stripe. The trailer came to rest on its right side facing north.

The tractor roof was crushed inward with the center portion and right side almost level with the dashboard. Witnesses at the scene stated the driver was pinned in the cab between the steering wheel, drivers seat, and damaged roof. The unrestrained driver received fatal injuries as a result of the accident. Examination of the cab revealed that there was no restraint system installed.

Santa Cruz, California
Case No. 33

The company did not maintain a driver's file as required by law. The company could not present any maintenance records on the accident vehicle at the time of the investigation.

A weight slip found in the glove box, dated 12/14/87, showed the gross weight of the accident vehicle to be 78,860 pounds. The gross vehicle weight rating (G.V.W.R.) for the trailer was 40,000 pounds. Subtracting the weight of the tractor from the gross vehicle weight leaves the trailer 21,550 pounds over its rating. Using the weight-per-axle formula, the vehicle was 5,580 pounds overweight.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 16 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

In addition, drug paraphernalia found in the driver's possession was sent to the CHT for drug identification. CHT found that the sample was positive for marijuana.

A screening test was also conducted at the request of the State of California. This screen only test indicated that the blood sample contained components of marijuana.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed of his overloaded vehicle on the roadway curvature. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 34

Investigation No.: MKC-88-H-TR03
Accident Location: U.S. Highway 395, 6 miles north of Lone Pine, California
Lanes: 2 lanes, undivided
Median: none
Features: Straight and level
Date and Time: December 15, 1987, 5:30 a.m.
Ambient Conditions: Clear, dry, and dark
Heavy Truck Involved: 1962 Peterbilt COE tractor in combination with two loaded 24-foot flatbed trailers
Motor Carrier: Charles E. Brown Trucking
Type of Operation: Common Carrier
Size of Operation: 2 power units
Total Weight of Truck: 79,040 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 1987 Freightliner conventional tractor in combination with a loaded 42-foot van trailer

Truck Fatalities:	1	Truck Injuries:	0
Other Fatalities:	0	Other Injuries:	1

FACTUAL SUMMARY

A Peterbilt pulling two trailers was southbound while a Freightliner combination was northbound, on a relatively straight and level section of two-lane, two-direction roadway. As the Freightliner approached the Peterbilt, it travelled into the southbound traffic lane. The Freightliner then struck the Peterbilt in the left front. A witness who was in front of the Peterbilt told the NTSB Investigator that his truck and the Peterbilt were traveling together and that they were driving between 60 and 65 mph when the accident occurred. The Freightliner was equipped with a Rockwell Tripmaster that indicated its speed as 55 mph at the time of the accident. After impact, the Peterbilt travelled off the roadway into the west ditch, as the power unit jackknifed to the left. It slid to the bottom of the ditch where it flipped into the inverted position and came to rest, 191 feet from the area of impact. As it flipped over, the converter dolly came lose from the front trailer at the pintle hook and the converter dolly with the rear trailer attached rolled over onto its top 159 feet from the area of impact. The fifth wheel on the homemade converter dolly split on both sides of the yoke, but the fifth wheel did not come lose from the kingpin, instead the pintle hook came open and the draw bar was disengaged from the front trailer. After impact, the Freightliner turned to the left as it slid across the southbound lane; it then continued into the ditch where it came to rest in the jackknifed position 208 feet from the area of impact.

This accident resulted in both power units being destroyed. One flatbed trailer was destroyed--the other flatbed and the box trailer received only minor damage. The unrestrained Peterbilt driver was found pinned in the wreckage with fatal injuries, while the restrained Freightliner driver received only minor injuries.

Lone Pine, California
Case No. 34

The driver of the Peterbilt had driven as a full-time truckdriver for the last two years. He had learned to drive a truck in the oil field where he was a mechanic. The driver had a California class 1 driver license with one violation for violating maximum truck speed and one violation for excess weight.

In an interview with the California Highway Patrol Officer after the accident, the driver of the Freightliner stated that he was having a little problem staying awake. At one time during the trip, he had pulled over to the side of the roadway and walked around his unit to wake up. After walking around his unit, he went back to driving, but he does not remember anything about the trip up until he felt the impact of the two units.

The Peterbilt driver's record-of-duty status indicated that he had driven only 15 minutes in the last 24 hours. But his record-of-duty status had not been changed since he was loaded in Battle Mountain, Nevada, 13 hours before the accident. In the last three days, the driver had been on duty for 16 hours and 45 minutes up until the accident with the 13 hours missing.

The Office of Motor Carrier had not received any information informing them that Brown Trucking was in business. The motor carrier kept no driver qualification files.

The investigation revealed that when the Peterbilt tractor was originally ordered, it was a 3-axle straight truck with a wheelbase of 215 inches and an overall length of 371 inches. At the time of the accident the power unit had only two axles with a wheelbase of 182 inches and an overall length of 242 inches.

Blood samples from the Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were not conducted by the State of California.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Freightliner driver due to fatigue.

CASE NO.: 35

Investigation No.: ATL-88-H-TR05
Accident Location: Interstate 20, 1/2 mile west of Atlanta, Georgia
Lanes: 6
Shoulders: Asphalt; left, 4 feet, right 10 feet
Median: Concrete median barrier
Features: Major interchange area
Date and Time: December 14, 1987; 1:35 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1981 Freightliner tractor in combination with an empty trailer
Motor Carrier: Nationwide Carriers, Inc.
Type of Operation: Common Carrier
Size of Operation: 237 power units
Total Weight of Truck: 25,000 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 1981 International tractor in combination with a chassis/container unit
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

At the interchange of Interstate 20 and Georgia 70, a 1982 Freightliner combination unit turned right from southbound Georgia 70 onto the entrance ramp of westbound Interstate 20 and stopped on the right shoulder. Both the driver and the codriver exited the tractor. Simultaneously, a 1981 International combination unit traveled west on Interstate 20 and entered the exit ramp at the interchange. As the combination unit descended the long exit ramp, the right side dual wheel assembly separated from the front tandem axle of the trailer. The dual wheel assembly continued in a westerly direction across the multiple traffic lanes of Georgia 70 and struck the Freightliner driver as he walked on the shoulder along the left side of his parked vehicle.

The Freightliner driver was fatally injured. There were no other injuries. There was no property damage except the wheel bearings and related components at the right front tandem axle position of the International's trailer.

A postcrash inspection of the Trailmobile chassis by an engineer representing the manufacturer related that the total lack of lubrication in the wheel bearing oil cavity created tremendous friction temperatures which destroyed the inner and outer bearings and allowed the complete drum, wheel, and tire assembly to come loose from the chassis. He also related that due to the lack of any burnt oil residue, it can be reasonably assumed that there was a long period of time that the wheel and tire assembly was sitting with no lubricant.

Examination of the available photographic evidence in the Safety Board laboratory revealed that the component failure was indicative of inadequate lubrication of the bearing.

Atlanta, Georgia
Case No. 35

The Freightliner driver was an experienced owner/operator. His training had been primarily orientation-type training with various motor carriers. The truckdriver possessed a valid Alabama operator license with no restrictions. In the past 3 years, he had two traffic convictions and no accidents recorded. There was no evidence of hours of service violations during several days prior to the accident.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) for screening, confirmation, and quantification according to the toxicological protocol. No, drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the separation of the Trailmobile trailer wheel assembly due to inadequate maintenance.

CASE NO.: 36

Investigation No.: CHI-88-H-TR04
Accident Location: Arcade Glenn Road, Ripon Township, Wisconsin
Lanes: 2, undivided
Median: None.
Features: Straight section of roadway with negative slope
Date and Time: December 14, 1987, 4:10 p.m.
Ambient Conditions: Daylight, cloudy, dry
Heavy Truck Involved: 1973 Chevrolet C65 straight tank truck
Motor Carrier: Frank S. Baird
Type of Operation: Private Carrier
Size of Operation: 1 straight truck
Total Weight of Truck: 19,200 pounds (approximate)
Total Length of Truck: 22.5 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The truck was traveling north on Arcade-Glenn Road. After it passed through the intersection of Arcade-Glenn Road and Coombs Road, it slowed from 25 mph to approximately 5 mph (according to a following witness) and went off the right side of the roadway. The truck entered the roadside ditch, struck an embankment, and came to rest upright. The truck received minor body damage in this accident. The 59-year-old driver was found unconscious at approximately 4:17 p.m. by a responding volunteer ambulance attendant. He was laying "with his legs in the floor area of the driver's side and the body slumped over in the middle just off the seat."

The driver was transported to the local hospital and pronounced dead at 5:12 p.m. An autopsy revealed that he suffered from coronary disease, but had suffered a fractured rib, punctured lung, and lacerated liver in this accident. The cause of death was listed as a sudden cardiac arrest, caused by a cardiac arrhythmia, resulting from cardiovascular disease and hypertension.

This driver delivered fuel oils to local farms and businesses, and also worked his own farm on a limited basis. He had operated the vehicle before, and had approximately 30 years of experience in this type of heavy truck. The driver was very familiar with the road where the accident occurred. The truck he was driving at the time of the accident had been loaned to him by the Condon Oil Company (the supplier of the fuel oils), until a recently purchased truck was delivered.

The cab of the truck was found to have substantial corrosion holes in the door sill and floor area. An exhaust muffler located beneath the cab was also found to be significantly corroded, and would rotate freely on the exhaust pipe. The exhaust pipe terminated below the cab. When the truck engine was started during the vehicle inspection, exhaust gases entered the cab interior.

Ripon Township, Wisconsin
Case No. 36

This driver had visited a local clinic at approximately 1:30 p.m. on the day of the accident. The physician at the clinic who saw the driver stated to the police that the driver had been having some coughing and was under treatment for bronchitis. The physician also stated that the driver was X-rayed and no pneumonia was found, blood pressure and heart rate were normal, and lungs were clear. The driver was also under treatment for possible peptic ulcer disease.

Maalox antiacid (30 of a 50 count bottle), Erythromicin, and Cimetidine tablets were found in the cab of the truck. The driver had allegedly stated to one of his customers on the day of the accident that he was having pains in his chest and left arm.

To operate the fuel delivery truck in Wisconsin, the driver was required only to have a valid chauffeur's license and be over 18 years of age. No periodic medical examination was required.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for carbon monoxide (CO).

Blood samples were also analyzed at the request of the State of Wisconsin. This analysis indicated that the blood sample contained a 3 percent saturation of carbon monoxide.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the driver due to cardiac failure.

CASE NO.: 37

Investigation No.: MKC-88-H-TR04
Accident Location: Interstate 55 and McLemore Road, Memphis, Tennessee
Lanes: Exit ramp, 1 lane, asphalt
Shoulders: Right side, 5 feet; left side, 1 foot
Median: None
Features: Right curved, at grade
Date and Time: November 14, 1987, 10:25 a.m.
Ambient Conditions: Daylight, clear and dry
Heavy Truck Involve: 1981 Mack tractor in combination with a partially loaded 48-foot MC-312 tank trailer
Motor Carrier: Mid-South Trucking Company, Ltd.
Type of Operation: Contract Carrier
Size of Operation: 4 power units
Total Weight of Truck: 52,700 pounds
Total Length of Truck: 59.5 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was northbound on I-55. It was traveling a straight and level section of road in the third (right) lane, which is an exit only lane to McLemore road and Presidents Island. As the vehicle entered the off ramp, it was negotiating a right curve with a posted advisory speed of 25 mph. The vehicle left a yawmark on the pavement. Using this yaw mark, the NTSB estimated a speed range of 51-59 mph. The vehicle then traveled onto the left shoulder and rolled onto its left side, fatally injuring the driver. The vehicle was transporting a partial load of liquid caustic soda (UN-1824). The manhole cover on top of the trailer came open and allowed approximately 3000 pounds of the hazardous material to spill into the drainage ditch.

The trailer had been repaired before NTSB Investigators arrived. However, a postaccident inspection of the power unit revealed no evidence of any mechanical failure. Police photographs taken of the vehicle in the final rest position indicate that the placards were in accordance with C.F.R. 49-172.504 (a). The investigating officer indicated that the driver was not utilizing a restraining device. The tractor sustained substantial damage, the left "A" pillar was displaced rearward into the driver compartment.

The truckdriver indicated on his application for employment that he had seven years experience driving trucks. There was a form showing an annual review of violations dated October 1, 1987, indicating no violations on his motor vehicle record for the previous twelve months as required by C.F.R. 49-391.21 (a), but it was not signed by the driver. However, a certified copy of this driver's motor vehicle record indicated that he failed to appear in court in Ohio, on February 7, 1987. He was then suspended on June 16, 1987, and reinstated on September 23, 1987. The Code Of Federal Regulations C.F.R. 49-391.21 (b) (9) requires a signed statement setting forth the facts and

circumstances surrounding a denial, revocation, or suspension of his operator license. The request by the company for a Tennessee driver's license check was dated July 7, 1987, but the response back to the company was dated October 14, 1987. The driver was issued a certificate of road test by Mid South Trucking on July 10, 1987, while he was suspended. This driver had only been with this company for four months and had been off sick with the flu for four weeks prior to the accident. This was his first trip after returning to work.

At the accident site, Interstate 55 was a generally level and at-grade limited access road. It had two lanes each direction for through traffic and a third lane that exits to McLemore Road. There was an overhead sign 1/10 mile before the exit gore that has the following words "Exit 11, McLemore Ave., Presidents Island," an arrow pointing down to the third lane, and two yellow plates with the words "Exit Only". The only other signs are a gore exit sign and a 25 mph exit advisory sign 25 feet past the gore on the left side of the ramp.

There were no toxicological samples from this driver submitted to the Center for Human Toxicology.

A screen only toxicological test was conducted at the request of the State of Tennessee. This test indicated the presence of salicylates (aspirin).

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for his vehicle and load on the exit ramp. Contributing to the accident was the poor location of the exit speed advisory sign. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 38

Investigation No.: ATL-88-H-TR06
Accident Location: Marietta Road, Atlanta, Georgia
Lanes: 2 lane, undivided
Shoulders: Grass/gravel; left, 6 feet; right 4 feet
Median: None
Features: At grade, downgrade right curve
Date and Time: October 27, 1987, 6 p.m.
Ambient Conditions: Raining, wet roadway surface, darkness
Heavy Truck Involved: 1981 GMC truck (bobtail)
Motor Carrier: Premier Transportation, Inc.
Type of Operation: Common Carrier
Size of Operation: 24 power units
Total Weight of Truck: 14,000 pounds
Total Length of Truck: 19 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The tractor was northbound on Marietta Road in Atlanta, Georgia. In the area of a 570-foot radius right curve along a three percent downgrade, the tractor began to skid laterally. It ran off the right side of the roadway onto a steep embankment and struck a utility pole. The tractor destroyed the utility pole and moved leftward back across the roadway. It ran off the left side of the roadway and crashed through a chain link fence before it ran into a ditch and impacted a steep embankment where it came to rest. The tractor was extensively damaged, and the unbelted driver was fatally injured. A witness estimated the preaccident speed of the tractor at 35 mph.

In the accident, there was no significant intrusion into the driver area of the cab of the tractor. The upper portion of the steering column was broken just below the steering wheel, obviously from force imparted by the unbelted driver in the latter impact of the accident.

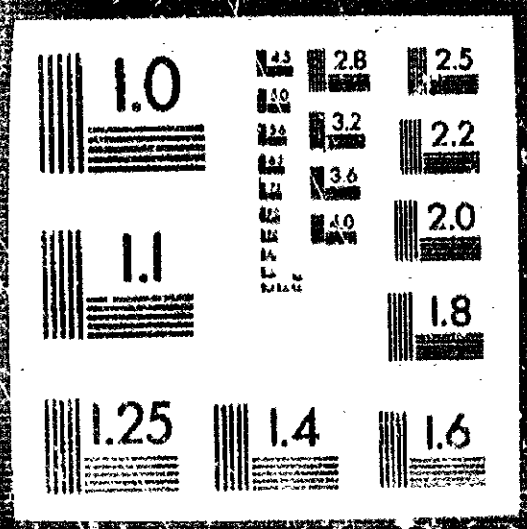
The truckdriver was formerly an owner/operator leased to the motor carrier. However, he was driving a tractor owned by the motor carrier at the time of the accident due to engine problems with his tractor. Since the experienced truckdriver nad been driving the accident tractor for about two months, the matter is not a factor in the accident. No pre-accident defect of the tractor was found.

The truckdriver had been off duty several days prior to the accident. At the time of the accident, he had been on duty less than one-half hour and had driven about one mile from where he had picked up the tractor at the motor carrier's facility. He was enroute to pick up a trailer as dispatched by the motor carrier. Although the truckdriver had been on duty less than 30 minutes, he had departed his home a few miles away about 11 a.m. earlier in the day. Activities of the truckdriver during the afternoon were not determined by the investigation.

2 OF 5

PB 90

917 003



Atlanta, Georgia
Case No. 38

The investigation, including a check of driver records in all states, revealed no history of alcohol or drug abuse or any related convictions. The truckdriver possessed only a Georgia driver license; valid with no restrictions.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the Toxicological protocol. CHT determined that the blood sample contained 0.13 percent alcohol. No other drugs, as identified by the NTSB testing protocol.

Blood samples were also analyzed at the request of the State of Georgia. Analysis performed by the Georgia Bureau of Investigation indicated that the blood sample contained 0.15 percent alcohol. Analysis performed by Grady Memorial Hospital indicated that the blood sample contained 0.16 percent alcohol. All samples were taken from the same area of the body of the decedent, and the same preservative was used in each sample.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to alcohol use.

CASE NO.: 39

Investigation No.: FTW-88-H-TR03
Accident Location: U.S. Highway 101, 3 miles south of Soledad, California
Lanes: 4 lanes, divided highway
Shoulders: Right, 8-foot wide asphalt shoulder
Median: 80-foot wide earthen median
Features: Elevated southbound lanes
Date and Time: January 2, 1988, 5:30 p.m.
Ambient Conditions: Cloudy and dry, dusk
Heavy Truck Involved: 1974 Ford COE tractor in combination with two loaded 20-foot flatbed trailers
Motor Carrier: Frank Harbin and Son Trucking
Type of Operation: Contract Carrier
Size of Operation: 12 power units
Total Weight of Truck: 70,000 pounds
Total Length of Truck: 56 feet
Other Vehicle Involved: 1982 Toyota Celica Supra
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The combination vehicle was traveling south on U.S. Highway 101 in the lane nearest the shoulder. The truck had entered the highway from a farm road approximately 1 mile away where the driver had picked up a load of carrots. As the combination unit continued southbound, a 1982 Toyota approached from the rear in the lane nearest the median, at a driver estimated speed of 62 mph. As the car closed on the truck, its left wheels dropped off of the paved surface onto the soft earthen median. The Toyota re-entered the travel lane, came across the spaced lane markers, and collided into the left side drive axle tire of the Ford tractor and the landing gear of the semi-trailer. This resulted in the Ford combination unit veering sharply to the left, and it began sideslipping to the right. The Ford departed the travel surface and entered the median where it flipped 180°, landing on its roof, and then rolled upright, coming to rest facing north in the median. The pull trailer did not roll over; the locking pin in the pintle hook broke when the tractor and semi-trailer flipped, and the pull trailer skidded into the median and came to rest upright. When the initial impact occurred, the Toyota rode up the tire of the Ford tractor and the hood of the car struck the bottom frame rail of the semi-trailer. After this impact, the car skidded into the median and came to rest in an upright position.

The Toyota driver stated that he had diverted his attention to insert a tape into his tape player and when he looked back to the road he was a lot closer to the truck, so he applied his brakes and turned into the median lane. He then stated that the truck moved into the median lane, and he hit the back trailer and was spun around. However, the tiremarks showed that the impact occurred in the lane occupied by the Ford combination unit.

During the rollover sequence, the roof of the Ford tractor was displaced and crushed downward far enough to fracture the driver's seatback and bend the passenger side seatback. The driver was killed. Witnesses stated that the

truckdriver remained in the truck cab during the rollover sequence and he was not ejected. The sideboards on the flatbed semi-trailer were displaced and the load of carrots was scattered over the median area. The Toyota sustained extensive damage and the driver received minor injuries.

The Ford combination driver had 40 years experience as a commercial driver and he had been operating double trailer combinations for 15 years. He had been working for his present employer for 15 years. The driver's record showed that he had been involved in 2 other accidents during the past 3 years, but he had not been convicted of any traffic violations during this period.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the inattentiveness of the Toyota driver. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 40

Investigation No.: DEN-88-H-TR05
Accident Location: Intersection of Baca County Road M and Baca County Road 45, 16 miles south of Walsh, Colorado
Lanes: 2 lanes, undivided
Shoulders: Gravel, varying widths
Median: None
Features: Straight, level, uncontrolled intersection
Date and Time: January 5, 1988, 3:25 p.m.
Ambient Conditions: Snowing, daylight, 15° F, visibility diminished
Heavy Truck Involved: 1976 International tractor in combination with a 44-foot tanker trailer
Motor Carrier: Petro Source Hydrocarbon Service
Type of Operation: Private Carrier
Size of Operation: 14 power units
Total Weight of Truck: 83,500 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: 1983 Peterbilt tractor in combination with a loaded hopper bottom trailer

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The 1976 International combination was eastbound on Baca County Road M. As the truck approached the intersection of Baca County Road 45, it passed "Dangerous Intersection" and "Yield Right of Way" signs. When the truck entered the intersection, it struck the right rear side of a southbound 1983 Peterbilt tractor/1984 Wilson grain hopper bottom semitrailer combination loaded with shelled corn. The impact was directly in front of the grain trailer's tandem axles, 17 feet from the back of the trailer, and broke the trailer into two pieces at that location. The Peterbilt tractor and forward part of the grain trailer remained together at the fifth wheel connection. It continued southbound for about 325 feet where it rolled over onto its left side, blocking the roadway and facing a southerly direction. The back part of the grain trailer went in a southeast direction for about 355 feet. The International cab separated from the frame, and came to rest at the southeast corner of the intersection. The tractor frame continued eastwards and came to rest along the south side of the roadway 156 feet from the impact location. The tanker trailer separated from the tractor at the fifth wheel connection, continued eastbound for about 200 feet, rolled onto its right side, and came to rest across the roadway facing southwest. Neither truck left skidmarks prior to impact. The terrain around the intersection was flat with a 6-foot high, 45-foot long propane tank set back on the northwest corner. Snow was falling covering the roadway with a thin layer of snow and diminishing visibility. Witnesses reported that both trucks were traveling about the same speed--between 55 and 60 mph.

The unrestrained driver of the International was ejected and fatally injured. The unrestrained Peterbilt driver received minor injuries which required hospitalization. The International tractor and both trailers were

destroyed. The Peterbilt tractor received minor damage on the left side. The NTSB investigation revealed no evidence of mechanical defects or deficiencies with either vehicle.

Visual observations from a cab of a similar International tractor indicated that the cab's left, 7 1/2-inch-wide, corner post was in the 45 degree location of the driver's left, forward line of sight. For trucks, such as these, converging at a 90° angle, about the same distance from an intersection, traveling about the same speed, this corner post could cause a blind spot and obscure the driver's view of the converging truck to his left. Adding to the view problem was a 45-foot long, 6-foot high, propane tank that was set back on the northwest corner of the intersection.

An investigation into the fatally injured driver's employment history revealed that he had been a truckdriver for the past three years. He had no formal truckdriver schooling, but learned truckdriving from his father and from experience. He was hired by his present employer on December 22, 1987. Prior to that, he drove trucks in Nebraska hauling livestock. An examination into the driver's activities for the 72 hours preceding the accident revealed nothing significant to the circumstance of this accident. A search of driving history revealed the driver received a Kansas Drivers License on July 21, 1987. At that time, he surrendered a valid Nebraska license. The Kansas license was clear of traffic offenses, but listed one accident involvement on August 1, 1987. The Nebraska license showed three speeding and two other violation in the last three years. On his employment application, the driver listed one accident and two citations. The National Driver's Register (NDR) had no listing on the driver.

The motor carrier was a private carrier and did not have an Interstate Commerce Commission (ICC) number. They were regulated by Federal Motor Carrier Safety Regulations. The company's files on the driver contained an employment application, dated December 27, 1987, a written test that was not graded, a road test, and a copy of the driver's last medical examination, obtained through his previous employer. Carrier officials stated, when questioned about the driver's file, that the driver was hired from a personal interview, and they did not know what was in the file as they had never reviewed the information. The officials also stated that the road test was given by a friend of the driver who was a fellow driver. The carrier had not been inspected by the Office of Motor Carriers.

Blood samples from the tanker truck driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the tanker truck driver were also tested at the request of the State of Colorado with negative results.

Walsh, Colorado
Case No. 40

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the tanker truck driver's failure to yield at the controlled intersection. Contributing to the accident was the poor visibility due to snow and the visual obstruction.

CASE NO.: 41

Investigation No.: MKC-88-H-TR05
Accident Location: Interstate 75, 4 miles east of Clinton, Tennessee
Lanes: 4 lanes, divided
Median: Grass median
Features: Generally straight, occasional curves
Date and Time: January 6, 1988, 5:30 a.m.
Ambient Conditions: Clear, dry, and dark
Heavy Truck Involved: 1985 International conventional tractor in combination with a loaded 48-foot box trailer
Motor Carrier: Gemini Transportation Services, Inc.
Type of Operation: Common Carrier
Size of Operation: 868 power units
Total Weight of Truck: 72,025 pounds
Total Length of Truck: 68 feet
Other Vehicle Involved: none
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

An International combination was northbound on I-75 when it went off the roadway onto the improved shoulder on the east side of the roadway. After going across the improved shoulder, the tractor went onto the unimproved shoulder and down into a ditch and rolled over on its right side, 520 feet from where it left the roadway. At this time, the tractor began to burn and the fire department was called to the scene. When the fire department arrived, they saw that the trailer was placarded for corrosive with the number 1823 on the placard. The fire department checked the Emergency Response Guidebook and found that the load was either caustic soda, lye, or sodium hydroxide. The fire department decided that the load should not be sprayed with water and they let the tractor burn down before putting out the fire. Fifteen persons were evacuated from the area. During the fire, the firemen opened the trailer and found that it was loaded with 900, 50-pound bags of caustic soda.

The International tractor was destroyed by fire and the trailer only received moderate damage. With the tractor being destroyed by fire, it was impossible to determine if the fatally-injured driver was using any restraint system.

There was no documentation that this driver had ever attended a formal truckdriving school before being employed with this trucking company. The driver did have five years of truck driving experience before he was employed on January 7, 1986. When the driver went to work for this company, he had a valid West Virginia driving license with only one violation for the past seven years. The violation was for speeding. A violation and review record dated 5/16/85 listed the speeding offense, a and warning letter that was sent to the driver on March 18, 1986. On January 7, 1987, the driver certified that during the past 12 months that he had only been convicted or had a forfeited bond on April 9, 1986 for speeding 69 in a 55 mph zone. The trucking company

received a driving record from the State of West Virginia with two violations on April 7, 1986. One violation was for speeding and the other was for driving too fast for conditions. Again on January 7, 1987, the driver filled out a violation and review record and certified that he had only been convicted or had a forfeited bond on April 9, 1986. The driver never listed the violation for driving too fast for conditions on any of his violation and review records for the company. On January 16, 1987, the trucking company again received a driving record on the truckdriver from West Virginia and new violations for speeding had been added. On March 2, 1988, NTSB received a driving record check on the driver and found that three more speeding violations were added to his record and that his driver's license was suspended from October 13, 1987, until November 30, 1987. It was again suspended on January 13, 1988, and a license pickup was ordered on February 4, 1988. The last suspension order and a license pickup order was issued after the driver was fatally injured and before the state was notified of the accident. The record of time worked kept by the company indicated that the driver stopped driving on October 10, 1987, three days before his driver's license was suspended for one month. The driver did not drive for the company again until October 25, 1987, at which time he went back to driving for five days. He then stopped driving again until November 30, 1987, at which time his driver's license was reinstated.

The driver left Houston, Texas, on January 5, 1988, and drove to Lake Charles, Louisiana. After his trailer was loaded in Lake Charles he left the plant at 1:10 p.m. on the way to Catlettsburg, Kentucky by the way of Baton Rouge, Louisiana, Meridian, Mississippi, Birmingham, Alabama, Chattanooga, Tennessee, Knoxville, Tennessee and Clinton, Tennessee. From Houston, Texas, to Lake Charles, Louisiana, is 128 miles and from Lake Charles to the accident is 791 miles.

The driver's wife related that he had "flu-like" symptoms at the time he left home on January 2, 1988.

The driver daily logs indicated that on four occasions during the month of December the driver drove from one location to another location at an average speed between 67 mph and 81 mph.

No maintenance or inspection records were sent to the company on the tractor for November or December as required by the company's driver policy & procedure manual.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, conformation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.22 percent alcohol and a 12 percent saturation of carbon monoxide (CO). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee. This test indicated that the blood sample contained 0.21 percent alcohol.

Clinton, Tennessee
Case No. 41

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to alcohol use and fatigue.

CASE NO.: 42

Investigation No.: LAX-88-H-TR09
Accident Location: Neuralia Road at Cantil Road, railroad grade crossing, near Mojave, California
Lanes: 2 lanes, undivided
Shoulders: Dirt, 20 feet, both sides
Median: None
Features Flat, straight, railroad grade crossing
Date and Time: January 8, 1988, 11:50 p.m.
Ambient Conditions: Night, dark, clear, dry
Heavy Truck Involved: 1980 Peterbilt COE tractor in combination with two partially loaded 28-foot trailers
Motor Carrier: Division Trucking Company
Type of Operation: Contract Carrier
Size of Operation: 48 power units
Total Weight of Truck: 50,000 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 211 car freight train

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The Peterbilt combination unit was traveling north as it approached a railroad grade crossing. There was no ambient light and no active protection at the crossing. As the Peterbilt driver approached the crossing at a witness reported speed of approximately 60 mph in the 55 mph zone, he passed a railroad crossing sign approximately 465 feet ahead of the tracks, and a railroad crossbuck sign painted on the road approximately 450 feet from the south end of the tracks. At a point approximately 260 feet before the crossing, the vehicle began to exhibit skid marks on the road surface. These marks continued for approximately 140 feet where evidence indicated the driver apparently input a 30° right turning maneuver in an attempt to turn his vehicle away from the crossing train. As the driver did so, the vehicle encountered loose gravel on the roadway. The vehicle exited the gravel and skid marks were noticed for approximately 12 feet before entering a 70 foot dirt bed south of the railroad tracks. As the rear of the unit entered the track bed, the front of the tractor impacted the 192 car of the train. The vehicle came to rest at impact. Five of the train's cars were derailed and sustained minor damage.

During the collision, the unrestrained driver of the Peterbilt was ejected as the cab disintegrated around him. None of the train's crew was injured. The tractor was destroyed and the first trailer sustained minor damage. The second trailer was undamaged.

The investigation revealed the driver was familiar with the vehicle but had not driven this route before. He had received professional training on the operation of a truck. He possessed a valid California Class 1 license, appropriate for this type of vehicle. The motor vehicle records indicate two prior speeding violations, two non-moving

violations, and one seat belt use violation on his record. There were no recorded prior accidents. Although two bags of white powder found in his possession initially tested positive in field testing as methadrine, subsequent lab tests found it to be an unregulated substance.

The line of sight for the driver was severely inhibited by a row of tall trees at the right road edge. In addition, the lack of lighting or active protection for the crossing coupled with the black color of the side of the train leads to a severe conspicuity problem. In addition, the dirt and gravel contamination on the road surface inhibited the vehicle's ability to slow sufficiently.

A postcrash inspection of the combination unit revealed that the brake system was in good working order and there was legally sufficient tread depth on the vehicle's tires. At the time of the accident, the railroad was in the processs of initiating the construction of an active grade crossing protection device due to the occurrence of two prior major accidents at this location.

The motor carrier has never been audited. It leases all of its equipment and contracts to a larger carrier for general freight delivery for a single department store.

Blood samples from the Peterbilt driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for the unfamiliar rural highway. Contributing to the accident was the lack of active protection and the poor location of the advance warning sign.

CASE NO.: 43

Investigation No.: NYC-88-H-TR06
Accident Location: Interstate 95 south, near the Kane Street on ramp, Baltimore ,Maryland
Lanes: 8 lanes, divided
Shoulders: Right, 12 feet; left 12 feet, asphalt paved
Median: Raised concrete and earthen, 10 feet wide
Features: Right curve
Date and Time: January 9, 1988, 2:25 a.m.
Ambient Conditions: Darkness, overcast, roadway was wet and the shoulders snow covered
Heavy Truck Involved: 1977 Peterbilt tractor in combination with a van trailer
Motor Carrier: Clifford B. Finkle Jr., Company
Type of Operation: Contract Carrier
Size of Operation: 85: Unknown
Total Length of Truck: 56 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination vehicle, carrying U.S. Mail, was on a scheduled trip from Jersey City, New Jersey, to Largo, Maryland. The southbound truck was negotiating a rightward 1145-foot radius curve when the driver apparently lost control of the truck. The truck ran off the left side of the roadway, struck and overturned onto the median barrier, then struck a high mast light pole. The truck came to rest on its left side on top of the barrier with the cab displaced rearward and to the left about 5 feet. The unrestrained 31 year old truckdriver was ejected and killed.

About 25 minutes before the accident, the case vehicle, while traveling southbound on Interstate 95, passed a police car at a speed exceeding 80 mph. The truck was stopped by the police about 10 miles north of the accident site and the driver was issued 3 traffic citations. The first was for "80 mph in a 55 mph zone," the second one was for "unsafe passing," and the third was for "negligent driving." The police said they also administered an on-scene breath test for alcohol and the results were negative. The truckdriver was released by the police and was last seen at about 2:15 a.m., traveling southbound.

The Peterbilt tractor was owned by Hazeltan Express Company. The truck was leased under a verbal agreement to Transport Leasing Company doing business as Clifford B. Finkle Jr. Company. The Clifford B. Finkle Jr. Company had a contract to deliver U.S. mail, daily, between Jersey City, New Jersey, and Largo, Maryland, using their trailers.

Hazeltan Express was the company that employed the case driver after prior approval by the Clifford B. Finkle Jr. Company. Hazeltan Express stated that they were paid per mile by the Clifford B. Finkle Jr. Company after they submitted the driver's log for the completed trip.

Baltimore ,Maryland
Case No. 43

Copies of the driver's logs were found in the Clifford B. Finkle Jr. Company file for the following dates: January 2, 3, 8, 1988. Hazeltan Express officials stated that he had filled in the logs for those days in order to be paid for the trips the case driver completed. They further stated that they had saw now daily logs from the case driver.

Also in the file was a copy of the drivers "Certificate of Qualification." The company whose name appeared on the document, Inter-Coastal, Inc., stated that this Certificate was not issued by their company. Furthermore, the validity of the "Medical Examiner's Certificate" could not be verified.

The driver was found to have a valid New Jersey operator's license as well as a suspended Florida Operator's License. He had also been issued a New York operator's license number as a result of receiving 3 moving violations within the state.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.17 percent alcohol, 80 ng/ml of benzoylecgonine (metabolite of cocaine), and 5 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Maryland. This test indicated that the blood sample contained 0.15 percent alcohol. However, the Marylany laboratory did not test the sample for marijuana or cocaine metabolites.

The blood alcohol level of 0.15 percent found by the Maryland laboratory is in resonable agreement with the 0.17 percent found by the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines the probable cause of this accident was the impairment of the truckdriver due to his use of alcohol, cocaine, and marijuana. Contributing to the accident severity was the inadequate cab structure of the power unit.

CASE NO.: 44

Investigation No.: DEN-88-H-TR06
Accident Location: Interstate 5, 1,573 feet north of Via De La Valle Road, Del Mar, California
Lanes: 8 lanes, divided
Shoulders: 10-foot wide, asphalt
Median: 2 feet, asphalt with "W-beam" guardrail
Features: Straight with 1 percent downgrade
Date and Time: January 9, 1988, 6 a.m.
Ambient Conditions: Clear, dry, dark
Heavy Truck Involved: 1986 IVECO 21-foot straight truck
Motor Carrier: Kyros Corporation
Type of Operation: Private Carrier
Size of Operation: 11 power units
Total Weight of Truck: 10,300 pounds (approximate)
Total Length of Truck: 21 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The truck was traveling south on Interstate 5 (I-5). At the intersection of I-5 and the off-ramp for Via De La Valle Road, the vehicle struck a small curb and exit sign. There was a 15 to 20 foot deep drainage ditch between the off-ramp and I-5. The vehicle went over the, curb leaving 84 feet of skid/tire marks along the right embankment of the ditch. The vehicle then rolled onto its right side, slid for a short distance to where it struck a concrete drainage ditch, then flipped onto its left side and slid along the left side of the ditch. It came to rest on its left side facing in a southwesterly direction with the driver pinned under the left front wheel. The vehicle traveled 322 feet from the area of impact with the EXIT sign. The section of roadway at the accident site is straight with a one percent downgrade. There were four southbound traffic lanes with a 10-foot paved shoulder at either edge of the lanes. There was an exit lane for the off-ramp. A company representative established that the driver had no deliveries to make which would have required the use of this exit ramp.

The accident resulted in fatal injuries to the unrestrained driver. Postaccident examination of the truck revealed that a lapbelt system in the driver's location was installed and working in a proper manner. The cab received moderate damage to the right front corner with minor right side damage to the box and heavy undercarriage damage. There was no evidence of mechanical defects. A three year check of the driver's record revealed no accidents or violations.

The driver had one week of training with the company in the operation of medium duty trucks. His total experience in medium duty trucks was the five months that he drove for the company.

Del Mar, California
Case No. 44

A company representative stated that he was not familiar with Department of Transportation (DOT) and Public Utilities Commission (PUC) regulations or how they pertained to the company. The company had never been audited by either the DOT or California PUC. The company did not have a formal training program for its drivers, nor did it maintain a driver's file on its drivers.

The investigation revealed that the 35-year-old driver left San Diego, California at 2200 hours. He drove to the fruit plant in Los Angeles, picked up a partial load, then drove to another plant in Orange County where he picked up the rest of the load. The driver then made deliveries in Irvine and Dana Point, California while en route to San Diego. A company representative stated there were no deliveries to be made in the Del Mar area. At the time of the accident, the driver was on a normally scheduled route. He drove this general route six nights a week, and was gone from home for at least 12 hours each day.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. It was noted, however, that the driver had received 20 units of blood and 5 units of cell saver before the samples were taken for toxicological testing.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue.

CASE NO.: 45

Investigation No.: CHI-88-H-TR06
Accident Location: U. S. Route 151, Grant County, Platteville, Wisconsin
Lanes: 2 lanes, undivided
Shoulders: 7-foot wide asphalt
Median: None
Features: 5 percent downgrade, right curve, roadway was cut through a hillside
Date and Time: January 12, 1988, 6:12 p.m.
Ambient Conditions: Blowing/drifting snow, darkness, about 15°F
Heavy Truck Involved: 1979 GMC Brigadier 3-axle dumptruck (empty)
Type of Operation: Common Carrier
Motor Carrier: Don Herbert Trucking
Size of Operation: 9 power units
Total Weight of Truck: 20,980 pounds
Total Length of Truck: 25 feet 3 inches
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The GMC dumptruck was traveling north when it entered a downhill right curve where the roadway cuts through a hillside. The northbound truck failed to negotiate the ice/snow covered curve, crossing over the opposing traffic lane and shoulder. The left front tire of the truck tracked 42 feet along a sight graded drainage ditch until the unit rotated counterclockwise about 95° prior to impacting an earthen/rock embankment with the right front bumper and fender. After the impact, the truck continued to rotate counterclockwise, traveling an additional 62 feet to a position of final rest. At final rest the truck was in an upright, position off the road facing easterly. No damage to other vehicles or private property occurred in this collision.

During the vehicle rotation and collision sequence the unrestrained driver received fatal head injuries. He was found on the passenger side of the truck with his head resting on the passenger side door and window. The truck received substantial damage in the collision.

Information furnished by the carrier indicated this driver had about 2 years of truck driving experience. His driver training consisted of ride-along experience with his father, a career over-the-road truckdriver, and 8 hours in-type training with the carrier. A search of driving history revealed the driver was operating with 2 valid driver's licenses; Iowa and Wisconsin. A check with both States revealed that both licenses were valid at the time of the accident. However, the record includes 3 previous license suspensions and 1 recession.

Platteville, Wisconsin
Case No. 45

A postcrash inspection of the dumptruck found the unit in good repair with no evidence of malfunction or defects in the truck's systems or components. Inspection of the occupant compartment of the truck revealed a 4 inch wide 1/2 inch deep dent on the interior roof above the passenger side door.

The carrier had been in operation for about 10 years, yet they failed to maintain any records on the driver or vehicle as required by Federal and/or State regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were not conducted by the State of Wisconsin.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed for his vehicle on the snow and ice covered roadway.

CASE NO.: 46

Investigation No.: NYC-88-H-TR07
Accident Location: Interstate 287 south, near milepost 22.9
Somerset County, New Jersey
Lanes: Four lane, divided
Shoulders: Right 12 feet, left 4 feet, asphalt paved
Median: Wooded, varying widths
Features: 4 percent downgrade
Date and Time: January 13, 1988, 4:45 a.m.
Ambient Conditions: Darkness, freezing rain, temperature 24 to 33° F
Heavy Truck Involved: 1984 Freightliner in combination with two trailers
Type of Operation: Common Carrier
Motor Carrier: P.I.E. Nationwide, Inc.
Size of Operation: 2559 power units
Total Weight of Truck: Unknown
Total Length of Truck: Approximately 64 feet
Other Vehicle Involved: 1986 International combination unit
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

A 1984 Freightliner with twin trailers was traveling south on Interstate 287. The weather was freezing rain and the road was ice covered. As the Freightliner reached the 22.9 milepost, it left the roadway, mounted the curb and struck a "W-beam" guardrail. The Freightliner then rebounded into the roadway and crashed into the side of a 1986 International combination which was jackknifed, partly blocking the right lane and a portion of the right shoulder. Several seconds before this crash, the International had been involved in an accident with two other trucks. One of these trucks had overturned and was partly blocking the left lane.

The Freightliner was crushed approximately 4 feet 7 inches rearward into the occupant compartment. The case driver was fatally injured and was extricated by rescue personnel after several hours. It is unknown if the driver was restrained.

The 51 year old truckdriver reportedly had over 30 years of experience in heavy vehicle operation and had over 7 years experience on this type of truck configuration. He also recently received a 2,000,000 mile safe driving award. The driver had been on-duty for 18.5 hours of the last 48, following 2 days off duty.

The investigation revealed that the New Jersey Department of Transportation had been notified by Accu Weather Service of mixed precipitation which was predicted to begin between 5:30 and 6 a.m. The New Jersey Department of Transportation's Trenton Emergency Control Center had scheduled salting and cindering operations to begin during that time period.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirm. ion, and quantification according to the toxicological protocol. No drugs, as

identified by the NTSB testing protocol, were identified. However, it was noted that the test sample was not sufficient for all tests but RIA (except THC) and volatiles.

Urine and liver samples from the truckdriver were tested at the request of the State of New Jersey. This analysis determined that the urine contained 5870 ng/ml of psuedoephedrine and that the liver sample contained 760 mg/Kl of psuedoephedrine.

The New Jersey laboratory did not have a sufficient amount of blood to measure psuedoephedrine. Thus, the values were given for urine and liver. Likewise, the Center for Human Toxicology had an insufficient blood sample for a complete drug screen.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Freightliner driver's misjudgement of the safe operating speed for his vehicle on the ice covered roadway. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 47

Investigation No.: SEA-88-H-TR07
Accident Location: Kansas Avenue and 14th Avenue, Hanford, California
Lanes: 2 lanes, undivided
Shoulders: Right side shoulder 1 foot of dirt
Left side shoulder 1 foot of dirt
Median: None
Features: At grade, straight, flat, intersection
Date and Time: January 20, 1988, 9:30 a.m.
Ambient Conditions: Foggy, 200 feet visibility, 45° F
Heavy Truck Involved: 1974 Peterbilt COE tractor in combination with an empty 40-foot flatbed trailer
Type of Operation: Private Carrier
Motor Carrier: Liquid Chemical Company
Size of Operation: 3 power units
Total Weight of Truck: 25,915 pounds
Total Length of Truck: 54 feet 8 inches
Other Vehicle Involved: 1970 White Freightliner COE in combination with two loaded 21-foot grain trailers

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	1

FACTUAL SUMMARY:

The Peterbilt combination was traveling south on 14th Avenue at an unknown speed. The conditions were foggy and the California Highway Patrol reported the visibility at 200 feet. As the Peterbilt was approaching the stop sign for Kansas Avenue, a 1970 White Freightliner pulling two loaded grain trailers was about to pass through the intersection westbound in front of the Peterbilt. There was no stop sign for the Freightliner, and as the doubles combination entered the intersection, the Peterbilt struck the first trailer behind the Freightliner on the right side. The Freightliner and both trailers continued forward on Kansas Avenue, rolled to its left side and came to rest on the left shoulder about 210 feet past the intersection. After the impact the Peterbilt tractor jackknifed and rotated 165° in a clockwise direction, then came to rest upright with the trailer still attached and rotated about 30°, also in a clockwise direction.

The unrestrained driver of the Peterbilt was ejected and received fatal injuries. He was found in the right hand lane of Kansas Avenue 143 feet west of the intersection. The unrestrained driver of the doubles combination received minor injuries. The Peterbilt tractor received extensive rearward crushing to the front portions. There was also a large section of the left side of the cab which was torn away. The flatbed trailer attached to the Peterbilt received only minor damage. Damage to the White Freightliner tractor was limited to minor deformation on the left side from the rollover. The first trailer had significant inward crushing to the right side caused by the impact with the Peterbilt. The only damage to the second trailer was some scratches and dents found on the left side.

Hanford, California
Case No. 47

Two of the four brakes on the Peterbilt tractor were not able to be checked as the towing operator had backed them off to facilitate removal. The remaining brakes on the tractor and trailer were found to be within adjustment tolerances recommended by the manufacturers. About 205 feet of assorted tiremarks were found on 14th Avenue leading up to the intersection. A "STOP AHEAD" sign was located 514 feet before the intersection.

An inspection of the Peterbilt driver's logbooks, excluding the day of the accident and the two previous days which were missing, showed no violations. His wife stated that he regularly slept four to five hours a night and she also said that he "was on the go a lot, working about 125 hours a week." Several requests for time cards from the carrier were made, but none were received.

The operator of the Peterbilt was in possession of a valid Washington State drivers license, and a California operator's license which had expired on 05-01-84. Neither of these licenses were endorsed for the operation of a combination vehicle. His driving record showed one violation and no accidents in Washington and eight violations and no accidents in the last 11 months in California. His wife stated that he had been driving heavy trucks for the past 10 years. He had worked for the present carrier for the last year and had received no formal training.

Blood samples from the Peterbilt driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determimed that the blood sample contained 120 ng/ml of benzoylecgonine (metabolite of cocaine). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Peterbilt driver were also analyzed by Central Valley Toxicology of Fresno, California, for the State of California. This analysis found that the blood sample contained 12 ng/ml of cocaine, 51 ng/ml of benzoylecgonine, 49 ng/ml of methamphetamine, and 37 ng/ml of amphetamine.

The reasons for the difference in reported concentrations of cocaine and benzoylecgonine by the two laboratories may be due to collection of blood specimens from different locations in the body. The concentrations of amphetamine and methamphetamine found by the California laboratory are both below the testing cut-off used by the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Peterbilt driver due to fatigue and his use of cocaine and methamphetamine and/or amphetamine.

CASE NO.: 48

Investigation No.: LAX-88-H-TR10
Accident Location: State Route 247 at State Route 62, Yucca Valley, California
Lanes: Eight lanes, divided
Shoulders: Varying width dirt all sides
Median: None
Features: 2,000-foot curve to left, 2 percent upgrade, at grade, signal controlled intersection
Date and Time: October 2, 1987, 11:05 a.m.
Ambient Conditions: Daylight, clear, dry
Heavy Truck Involved: 1973 GMC 3-axle COE in combination with a fully loaded 40-foot flatbed trailer
Motor Carrier: Finn Industries, Inc.
Type of Operation: Private Carrier
Size of Operation: 2 power units
Total Weight of Truck: 80,000 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 3 passenger vehicles

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	1	**Other Injuries:**	0

FACTUAL SUMMARY:

The GMC combination was southbound on State Route 247, at what witnesses described as high speed, when it approached the intersection with State Route 62. A witness related that the truck was sounding its horn as it approached. The 4-way traffic signal was red for the combination unit's direction of travel. Traffic was stopped ahead, with passenger cars in both the curb side of the right lane and the left lane. The truck steered between the two stopped vehicles and sideswiped both. The truck crossed a depressed drainage channel at the north edge of the intersection and, after becoming airborne, struck and partially overrode the right side of an eastbound passenger vehicle. The impact deflected the passenger vehicle to the right in a clockwise rotation. The truck continued across 5 lanes, struck an 8 inch curb, and rolled onto its top. The vehicle slid an additional 80 feet before coming to rest, inverted, facing west in the traffic lanes of a frontage road parallel to and south of State Route 62.

The GMC truck sustained severe crush damage to the cab, principally to the right front. This distortion trapped and crushed the partially ejected driver, inflicting fatal injuries. The two side-swiped vehicles sustained minor damage but none of the unrestrained occupants were injured. The unrestrained driver of the passenger car broadsided by the truck sustained fatal injuries.

This driver had been employed as a part-time truckdriver for approximately 1 1/2 years by the carrier, but was unfamiliar with the tractor he was driving. He had driven his regular truck to the pick-up point approximately 44 miles from the accident site. That vehicle had experienced a mechanical breakdown and the company mechanic had delivered the case vehicle on the evening preceding the accident. He had only driven this vehicle the 44 miles

from the shipper's location at the time of the accident. He had no prior training, and had only limited experience driving a truck before taking this position. The driver's record indicated 3 prior violations and no accidents in the previous 5 years. A small amount of marijuana was found in the driver's bag.

The investigating officer who arrived on scene within 10 minutes of the accident found all brakes to be cold to the touch. The investigation revealed that 7 of 8 brakes were out of adjustment. A copper tube within the air system had chafed and breached after rubbing on a frame member. A failure of this system would have depleted the air, but, due to the age of the trailer, there were no emergency brakes on the unit. The #1 axle brake chamber diaphragm was deteriorated due to oil contamination and two holes, measuring 1 and 2 inches, were found in the diaphragm. Oil stains found on the diaphragm and on the outside of the chamber indicate a long-term contamination. A recent OMCS audit indicated an unsatisfactory rating for the company, including the area of maintenance and maintenance record retention. An interview with the decedent's wife revealed that the driver's trips had been delayed or canceled numerous times in the past due to the poor mechanical condition of his truck. This particular trip had been interrupted when the driver's regular truck broke down enroute and the case vehicle was substituted.

There were no toxicological samples from this driver sent to the Center for Human Toxicology for analysis.

Toxicological tests conducted by the State of California indicated only the presence of caffeine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the lack of a functioning brake system on the truck due to inadequate maintenance. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 49

Investigation No.: ATL-88-H-TR07
Accident Location: I-77, 11 miles north from Statesville, North Carolina
Lanes: 4 lanes, divided
Shoulders: Asphalt, 10 feet wide on right side, 4 feet wide on left side
Median: 138 feet wide grassed
Features: Tangent on descending grade
Date and Time: February 3, 1988, 6:55 a.m.
Ambient Conditions: Darkness, cloudy skies, light rainfall
Heavy Truck Involved: 1979 Freightliner COE tractor in combination with an empty 39 1/2-foot log trailer
Type of Operation: Common and Contract Carrier
Size of Operation: 2 power units
Total Weight of Truck: 27,200 pounds
Total Length of Truck: 48 feet 6 inches
Other Vehicle Involved: 1973 GMC COE tractor in combination with a loaded freight-van trailer

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The driver went on duty at Rock Hill, South Carolina, about 9 1/2 hours prior to the accident. He drove the combination unit approximately 350 miles during the night transporting two loads of tree logs to Elkin, North Carolina. The first load was delivered just after midnight. He returned to Rock Hill, reloaded the trailer, and then delivered the second load about 6:20 a.m. A short time later he left Elkin driving the unit south on I-77 on the return trip to Rock Hill. About 20 miles from Elkin, the log truck was traveling in the right lane, negotiating a long right curve, when a second tractor/trailer unit (transporting a load of apples) entered the highway from a rest area located on the right side of the roadway. A southbound automobile driver, who was moving by the log truck in the curve, advised that the apple truck turned into the right lane of the highway some several hundred feet ahead of the logtruck. He stated that lights on the rear of the semitrailer of the apple truck were on making it clearly visible. The automobile driver continued ahead in the left lane and started to pass the slower moving apple truck. Simultaneously, he continued to view the approaching log truck through his rear view mirror. The logtruck continued straight ahead in the right lane at a constant speed and crashed into the rear of the slower moving apple truck's trailer. The automobile driver estimated that the apple truck was traveling between 25 and 30 mph and the log truck was traveling between 55 and 60 mph at impact. The log trailer's 5th wheel pin was broken away by the impact forces and it was separated from its tractor coupling. The apple truck, engaged with the logtruck's tractor at the rear of its trailer, veered right from the traffic lane, crossed the asphalt shoulder, and struck a guardrail paralleling the right side of the roadway. It continued forward with its right side tires in contact with the guardrail for a distance of about 175 feet. The apple truck came to rest on the right shoulder, still in contact with the guardrail, and about 319 feet south from the initial point of

impact. At rest, the logtruck's tractor was upright and still engaged with the rear of the apple trailer. The log trailer was at rest a short distance from the rear of its tractor; it was upright across the right traffic lane and the shoulder. A small fire that ensued below the logtruck's tractor cab was quickly extinguished.

The front end of the logtruck's tractor was severely crushed and its steering wheel was forced rearward, pinning the unrestrained truckdriver to his seat; he was killed instantly. The log trailer received minor damage. The apple truck's tractor received minor damage--its trailer was destroyed by rear end crush damage. The restrained apple truckdriver was not injured.

The 43-year-old logtruck driver had no formal truckdriver training. He had driven combination truck units for less than two years and been employed by the motor carrier for about three months. He held a single valid South Carolina drivers license. The South Carolina record revealed one accident and one traffic violation conviction during the previous three years. The motor carrier had not qualified the driver as required by the Federal Motor Carrier Safety Regulations (FMCSR). However, a Driver Qualification File from another motor carrier where he was employed a year earlier revealed that he was was qualified as an interstate driver under the FMCSR requirements. He was not preparing daily logs and had received no sleep for the 23 hour period preceding the accident. He had slept 8 hours at his home on the previous night then worked at the motor carrier's garage from 8 a.m. until 5:30 p.m. He ate supper and remained at home until about 9 p.m., then drove his automobile to Rock Hill where he began driving the truck about 9:30 p.m.; he then remained on duty driving the truck for the following 9 1/2 hours until the accident occurred. When the accident occurred he had been on duty approximately 18 hours. In addition, an autopsy revealed that he suffered from severe pulmonary emphysema as well as moderate arteriosclerosis.

Blood samples from the logtruck driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the logtruck driver were also tested by the State of North Carolina with negative results. The North Carolina analysis was for alcohol only; no drug tests were conducted.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the logtruck driver due to fatigue and health problems. Contributing to the accident was the poor conspicuity of the leading trailer.

CASE NO.: 50

Investigation No.: ATL-88-H-TR08
Accident Location: U. S. 17, 3/10 miles south from Bolivia, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Grassed, 8-feet-wide on right side, 6-feet-wide on left side
Median: None
Features: Left curve, level, at grade
Date and Time: February 10, 1988, 4:50 a.m.
Ambient Conditions: Clear, darkness, slippery pavement
Heavy Truck Involved: 1984 conventional cab Freightliner in combination with an empty 38.5-foot dry bulk tank trailer
Motor Carrier: Big Concrete Supply, Inc.
Type of Operation: Private Carrier
Size of Operation: 27 trucks, 11 tractors
Total Weight of Truck: 31,000 pounds
Total Length of Truck: 56 feet
Other Vehicle(s) Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The truckdriver had left his North Myrtle Beach, South Carolina, home about an hour earlier driving the combination unit north en route to load a shipment of dry cement at Wilmington, North Carolina, about 54 miles away. He had traveled about 37 miles when his vehicle began approaching a 554-foot-long, four degree left curve; earlier a truck had spilled liquified Mycelium (a slippery organic material) onto the roadway pavement. A third combination unit traveling north and about 20 minutes ahead of the subject truck jackknifed as it negotiated the curve covered with the liquid Mycelium. The truckdriver lost control of the vehicle on the slippery pavement and overturned off the roadway in a wooded area. The driver was severely injured and trapped within the tractor cab. According to that driver, he heard the subject truck unit approaching with it's engine maintaining a constant speed; he then heard "screeching tires" as the truck traveled onto the slick pavement in the curve and the driver lost control. The out-of-control truck continued traveling forward while angling left across the southbound traffic lane. It ran off the left pavement edge then crossed the earthen shoulder and a small ditch at the west side of the roadway. While crossing the ditch, the unit jackknifed and the tractor broke away at its fifth wheel coupling to the trailer. The tractor overturned and stopped in a shallow pond of water resting on it's roof, the trailer remained upright. There was no witness or physical evidence to determine the speed of the vehicle. The truck traveled about 425 feet north and 20 feet west of the roadway from the location where the driver lost vehicle control to where it came to rest in an open area near a woodsline paralleling the highway.

The trailer fifth wheel pin sheared from the upper fifth wheel plate, it's left support was broken away and minor piping damage occurred beneath the tank. The tractor cab was severely crushed. The roofline above the

windshield was crushed to near contact with the dashboard. The unrestrained truckdriver was trapped inside the cab and was declared dead at the site.

The 51-year-old driver attended a truckdriver training school. The school was conducted by a large motor carrier where he was first employed as a truckdriver in 1969. He had driven heavy truck units for 17 years and had been employed by this motor carrier for about 2 1/2 years. He held a valid South Carolina drivers license which required him to wear corrective lenses. His previous three year driving record revealed no traffic violations and one minor accident. The motor carrier had not qualified the driver as required by Part 391 of the Federal Motor Carrier Safety Regulations (FMCSR). Except for a check of his South Carolina traffic record, the carrier conducted no background check on the driver, and had not required him to be medically examined or take a written and road test. The Safety Board's investigation revealed that the truckdriver was driving while disqualified by the FMCSR. His privilege to operate vehicles in the State of Virginia had been under suspension since 1982 for failure to pay a overload fine. Part 391.15 of the FMCSR disqualifies an interstate driver when his drivers license, or operating privilege, is under suspension. The truckdriver was in compliance with the FMCSR Hours of Service regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested by the State of North Carolina with negative results. The North Carolina analysis was for alcohol only; no drug test was conducted.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the contamination of the roadway surface due to the spilled Mycelium. Contributing to the severity of injuries was the inadequate cab structure of the power unit.

CASE NO.: 51

Investigation No.: MKC-88-H-TR06
Accident Location: I-24, Clarksville, Tennessee
Lanes: 4-lanes divided
Shoulders: Left shoulder 4 feet; right shoulder 10 feet; both shoulders are asphalt surfaced
Median: 200-foot wide earthen area covered with grass, brush and small trees
Features: Straight and at grade
Date and Time: February 10, 1988, 7:40 p.m.
Ambient Conditions: Clear and dark
Heavy Truck Involved: 1981 GMC COE 3-axle tractor in combination with a loaded 48-foot trailer
Motor Carrier: Murrow's Transfer, Inc.
Type of Operation: Common carrier
Size of Operation: 75 power units
Total Weight of Truck: 71,503 pounds
Total Length of Truck: 59 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

On February 10, 1988, at 7:40 p.m., a 1981 GMC tractor in combination with a loaded 48-foot Fruehauf trailer was southbound on I-24 near Clarksville, Tennessee. The combination unit departed the travelway on the left side, entered the median, and traveled southbound in the median for 668 feet where it came to rest on it's wheels, jackknifed to the right. The median area that the combination unit traveled over was rough and covered with small trees and brush. There was no postimpact fire nor any indication of system failure on the truck.

The driver was alone in the vehicle and was restrained by a static, seat mounted lap belt. This seat mounted system also incorporated a tether strap on each side of the seat frame to the floor of the truck cab. The medical examiner stated that the driver died as a result of injuries sustained in the accident. However, there was no autopsy performed to confirm the cause of death. The combination unit traveled over some rough terrain and small trees which caused minor damage to the front bumper, windshield and undercarriage of the truck and trailer.

The driver, even though he had only been with this carrier for approximately 8 months, listed 8 years experience from 1954 to 1962 on his application for employment. His application also reflected 400,000 miles driven in truck/trailer, straight truck, and military trucks. He had been away from the trucking industry for several years, so he enrolled in the M.T.A driving school in Greensboro, North Carolina. He completed the school in January 1987, and drove for Blue Ridge Transfer until joining this carrier on June 1, 1987.

Clarksville, Tennessee
Case No. 51

Although it did not show on the motor vehicle driver file obtained by NTSB from North Carolina, the driver listed two speeding violations in 1985 and one in November 1987.

This driver suffered a heart attack on August 30, 1985. He was taken to Leigh Memorial Hospital in Norfolk, Virginia, then transferred to Norfolk General Hospital, where he had single by-pass heart surgery. He had pneumonia on several occasions, the last time was during the winter of 1986. In November 1987, he complained of being continually tired. He visited a local physician in Thomasville, North Carolina, where he received a complete physical, including a treadmill test. He received a new prescription for Nitrostat tablets and returned to work. His wife indicated that he had been suffering from a cold the week prior to the accident. During a telephone call he made to his wife 1.5 hours before the accident he indicated that he was not feeling well and that he felt a tightness in his chest like he was getting pneumonia again. She reminded him of the heart medication (Nitrostats) that he carried in the truck. The investigating police officer reported that the injuries that were visible were not of a life threatening nature and there was not any excess bleeding.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. It was noted, however, that the test sample was not of sufficient quantity to test for benzodiazepines and anti-convulsants.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 52

Investigation No.: CHI-88-H-TR07
Accident Location: I-90/94 eastbound lanes, at Portage Road, in Dane County, Wisconsin
Lanes: 6 lanes, divided highway
Median: Grass covered
Features: Straight roadway at overpass with "W-beam" guardrail
Date and Time: February 25, 1988, 9:20 a.m.
Ambient Conditions: Daylight, clear, dry
Heavy Truck Involved: 1985 Freightliner tractor in combination with a loaded van trailer
Motor Carrier: Rocky's Trucking
Type of Operation: Common Carrier
Size of Operation: 4 power units
Total Weight of Truck: Approximately 79,980 pounds
Total Length of Truck: Approximately 55 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit loaded with 47,600 pounds of bentonite clay powder was traveling south on I-90/94 in the eastbound lanes. At the Portage Road overpass located in Dane County, Wisconsin, the vehicle exited the right (west) side of the roadway while traveling on a straight, level, three lane wide section of a divided six lane wide highway. After crossing the roadway shoulder and a pavement rumble strip, the combination vehicle struck and penetrated the "W-beam" guardrail and entered the roadside. The combination then traveled up the embankment supporting the west end of the Portage Road overpass and struck the underside of the bridge deck located approximately 147 feet from the pavement rumble strip. This impact raised the northwest corner of the bridge deck approximately 2 inches. The tractor was wedged between the concrete sheathing of the embankment and the underside of the Portage Road overpass bridge deck.

During the collision, the Trailmobile trailer struck the rear of the Freightliner tractor and the edge of the Portage Road bridge deck, and was torn open by deformation. Several of the 100 pound bags of bentonite clay powder cargo of the trailer were ruptured and spilled at the scene. The driver was entrapped in the crushed wreckage of the tractor and received fatal injuries.

According to the owner/safety director of the motor carrier this driver was leased to, the driver had planned to meet a codriver before leaving on this trip to help with the driving hours. The company owner stated he had learned, following the accident, that the codriver did not keep that appointment--the driver was the only occupant in the truck tractor. The motor carrier owner stated that the driver evidently decided to make the trip despite being without a codriver.

Dane County, Wisconsin
Case No. 52

The driver was completing a driver's log of duty status, and was also keeping records of dates, locations, and mileages in a second notebook of "trip" sheets. On February 22, 1988, the driver had filled out two different pages in the driver's log book. One of those pages listed the driver as having drove 343 miles. The other log book page for that date listed the driver as having drove 481 miles.

According to his "trip" sheet on February 22, the driver went from Philip, South Dakota, to Winona, Minnesota, with a load of wheat, then from Winona, Minnesota, to St. Paul, Minnesota, for a load of beer and pop to Rapid City, South Dakota. He left Philip, South Dakota, on February 22, and returned to Rapid City, South Dakota, on February 23. The "trip" sheet shows starting mileage of 322,737 and ending mileage of 324,180 - 1,443 miles. This does not agree with the 343 miles or the 481 miles listed on the two different driver's log book pages for February 22, and the 24 hours listed as off duty on February 23. The driver had purchased 186.6 gallons of gas on February 22, and February 23 in Jackson, Minnesota.

"Trip" 435 on February 24, 1988, began in Rapid City, South Dakota, at 324,180 miles, and ended at the accident scene, mileage 325,066 - 886 miles. The log book entries for February 24 show 350 miles recorded to Oakdale, Wisconsin.

The Wisconsin State Highway Patrol interviewed a repairman at Mauston, Wisconsin, in Ernie's Service Station, who that stated this driver had the right rear trailer tire repaired sometime after 0730 on February 25, the morning of the accident. Mauston, Wisconsin, is located approximately 70 miles northwest of the accident scene on I-90/94.

According to the these "trip" sheets and the mileages listed, the driver had driven 2,329 miles in the time from February 22, 1988, to the accident. This driver's log book entries for this period total 693 miles in 13.5 hours of driving time for that same period.

49 CFR Ch. III 395.8, "Driver's record of duty status," states:

> . . . (7) Signature/certification. The driver shall certify to the correctness of all entries by signing the form containing the driver's duty status record with his/her legal name or name of record. The driver's signature certifies that all entries required by this section made by the driver are true and correct.

Tiremarks were found on the roadway shoulder at the scene of this accident. These marks extended across the shoulder for a distance of approximately 103 feet, into the struck guardrail and the furrows seen in the roadside leading to the final rest location of the Freightliner vehicle. The tiremarks were straight and showed no angulations.

One witness in another truck traveling some distance behind the accident vehicle stated that the accident vehicle was passed by an auto on the right. The car made a move to the left in front of the accident vehicle and the brake lights of the trailer came on.

Dane County, Wisconsin
Case No. 52

Another witness stated he saw the accident vehicle drive under the bridge. At the time of the accident, a driver from Janesville Auto Transport was behind him (the accident vehicle) and was yelling on the radio for him to hang onto it. He further stated that, at the time of the accident, he and the other vehicles were travelling about 55 to 60 mph.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 370 ng/ml of methamphetamine. No determination of carbon monoxide saturation was done. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Wisconsin. This test indicated that the blood sample contained a 7 percent saturation of carbon monoxide. The laboratory did not test for methamphetamine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue and methamphetamine use. Contributing to the severity of this accident was the failure of the guardrail to redirect the errant combination vehicle back onto the roadway.

CASE NO.: 53

Investigation No.: MKC-88-H-TR07
Accident Location: Tennessee Highway 114, 1 mile east of Scotts Hill, Tennessee
Lanes: 2 lanes undivided
Shoulders: Both shoulders were grass, the northwest being 52 inches wide and the southeast shoulder only 12 inches wide
Median: None
Features: Rolling hills and curves
Date and Time: February 26, 1988, 5:20 a.m.
Ambient Conditions: Clear, dry, and dark
Heavy Truck Involved: 1981 GMC COE tractor in combination with a partially loaded 48-foot van trailer
Motor Carrier: Quartet Manufacturing Company
Type of Operation: Private Carrier
Size of Operation: 16 power units
Total Weight of Truck: 42,799 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: 1980 Mack conventional tractor in combination with a empty 24-foot dump trailer

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

A Mack tractor in combination with a dump trailer was traveling in a northeast direction when a GMC tractor in combination with a 48-foot van trailer traveling in a southwest direction came across the centerline of the 2-lane road and struck the Mack in the left front. After impact the GMC jackknifed into the left side of the trailer. The front of the trailer slid into the ditch on the northwest side as the rear of the trailer slid across both lanes of traffic 158 feet from impact. After impact the Mack travelled off the roadway into the southeast ditch where the truck and trailer turned over on it's right side. The truck then slid back onto the highway and came to a stop, blocking both traffic lanes 80 feet from impact.

This accident resulted in both power units being destroyed but the two trailers received only minor damage. The unrestrained GMC driver was found in the wreckage with fatal injuries; the restrained Mack driver received only minor injuries.

The driver of the GMC had been a casual driver for this company since August 5, 1986. From August until the day of the accident, the driver had been on only two trips for the company. He had a total of 26 years of truckdriving experience, but had received no formal truckdriving training. The driver had a valid Mississippi commercial driver license with no violations listed.

At 2:30 p.m. on February 25, 1988, the driver's record-of-duty status indicated that the driver continued to drive after being on duty for 15 hours. Also during this time, he drove more than 10 hours without being off duty for

8 consecutive hours. His record-of-duty status also indicated that on February 25, 1988, at midnight that he was off duty in Florence, Kentucky, but five hours and twenty minutes later the driver was involved in the accident 391 miles away.

Blood samples from the GMC driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood contained a 13 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the fatally injured truckdriver were also tested at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the GMC driver due to fatigue.

CASE NO.: 54

Investigation No.: CHI-88-H-TR08
Accident Location: Wisconsin State Highway 29, Wausau, Wisconsin
Lanes: 4-lane divided highway
Shoulders: 7 foot 9 inches asphalt on the right side, 3 to 6-foot wide asphalt on the left side
Median: 71-foot earthen
Features: Straight and level
Date and Time: February 25, 1988, 4:10 p.m.
Ambient Conditions: Clear, dry, daylight conditions; the temperature was about 20°F
Heavy Truck Involved: 1979 3-axle GMC Brigadier straight tank truck with a partial load of liquid sewage
Motor Carrier: Modern Sewer Service
Total Weight of Truck: 46,312 pounds
Total Length of Truck: 30 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The GMC tanker truck was traveling eastbound on State Highway 29 when the truck's left side tires departed the traffic lane onto the left shoulder. The truck veered to the right causing the tanker's liquid load to shift to the left. The unit crossed both eastbound traffic lanes and the unit's right side tires departed the road surface onto the right shoulder. The truck then veered to the left, back towards the right traffic lane. The liquid load shifted to the right and the truck rolled over onto its right side, then onto its roof. The tank impacted a bridge rail during the rollover sequence and separated from the truck chassis. The truck's roof was crushed downward by the ground impact, fatally injuring the lapbelt restrained driver.

Investigators recorded tire loading marks on the roadway from the truck's left side tires traveling in the left lane onto the left shoulder back onto the left lane and ending at the center line--a distance of about 150 feet. The right side tires began marking as the liquid load shifted from the left side of the tank to the right side. The right side rear tandem tires also left
skidmarks on the road surface as the unit crossed over the right lane onto the right shoulder and swerved back towards the right traffic lane where it rolled over, a distance of about 96 feet.

The accident resulted in the destruction of the tanker truck. The liquid sewage tank separated from the truck chassis mounts when its right side impacted a bridge rail during the rollover sequence. The lapbelt restrained driver was fatally injured when the truck cab roof was crushed downward by the rollover ground impact. The truck's tank sustained right side impact damage from the bridge rail and other ground impacts, including damage to the top manhole cover, allowing the liquid sewage load to escape.

Wausau, Wisconsin
Case No. 54

The driver of the truck was the company owner--a plumber by trade. He was an occasional operator of the vehicle when the regular driver was off. Because the company owner was not the principal driver and driving was not his principal occupation, he was not required to have a chauffeur's license. He could occasionally operate the truck with a "regular" driver's license. A search of his driving history revealed no recorded accidents or vehicle operation related offense convictions in the 12 months preceding the accident. The driver had about 8 years of truckdriving experience, although he had never received formal truckdriver training. The company did not maintain a driver's qualification file or logs for the operator of the truck. The owner's live-in girlfriend and the regular truckdriver both stated, in summation, that on the day before the accident the deceased had complained of flu-like symptoms but had gone to work anyway. Later that day a leak was discovered in the company's diesel fuel storage tank. The owner worked until about 2 a.m. (February 25th) Thursday morning to fix the tank. The owner slept from about 2 a.m. until 8:30 a.m. When he awoke he was told that his regular driver was ill and he would have to do the day's pumping/tanking operation. The driver departed his residence at 9-9:30 a.m. for the office. At about 4:10 p.m., the owner was involved in the fatal accident. He was 1.5 miles from the last pickup/pumping operation, en route to dump the liquid load at the Wausau City treatment plant.

A postcrash inspection of the GMC tank truck revealed the slack adjusters for the brakes on the steering axle were adjusted so the brakes would not activate during an application. The left side suspension on the steering axle had old fractures in the leaf springs; the parking brake on axle #2, the right side, was not working, and the right side seal on axle #3 was leaking, contaminating the brake drum and pads with axle lubricants.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2400 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Wisconsin with negative results. It was noted in the coroner's report that the driver "apparently fell asleep causing the truck to depart the left side of the road."

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the accident was the driver's inexperience. Contributing to the severity of the accident was the inadequate rollover protection provided by the truck cab structure.

CASE NO.: 55

Investigation No.: FTW-88-H-TR04
Accident Location: Interstate 10, 4 miles west of Beaumont, California
Lanes: 6-lanes, divided highway
Shoulders: Right side: 9-foot wide asphalt shoulder
Left Side: 16-foot wide asphalt shoulder
Median: 54-inch high concrete barrier
Features: 1.7 percent upgrade
Date and Time: March 1, 1988, 12:20 a.m.
Ambient Conditions: Cloudy and dark with a wet road surface
Heavy Truck Involved: 1976 COE Freightliner 3-axle tractor in combination with a loaded 40-foot tanker trailer
Motor carrier: Flying J. Inc.
Type of Operation: Private Carrier
Size of Operation: 37 power units
Total Weight of Truck: 76,165 pounds
Total Length of Truck: Approximately 60 feet
Other Vehicle Involved: 1976 COE Feightliner 2-axle tractor in combination with 2 loaded trailers
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

At approximately 12:20 a.m. on March 1, 1988, the case operator was driving a 1976 3-axle Freightliner in combination with a 1976 Timpte tanker trailer. The 9,500 gallon capacity tanker was loaded with 7,395 gallons of diesel fuel. The combination unit was travelling east on Interstate 10 in a 3,500-foot radius curve to the right at an estimated speed of 60-65 mph when it collided into the rear of a 1976 2-axle Freightliner that was pulling two loaded trailers at an estimated speed of 30-35 mph. At impact, the right 3 1/2 feet of the tractor tanker combination unit contacted the left rear of the rear trailer on the double trailer unit. The rear trailer was crushed inward approximately 7 feet and the axle was displaced. This trailer travelled approximately 120 feet from the impact area, coming to rest across the traffic lane nearest to the shoulder. The rear of the front trailer of the double trailer combination unit came to rest approximately 140 feet from the impact area. The converter dolly was displaced from the trailer and its tongue was bent upward at a 90° angle. There were no precrash skidmarks.

The case truck departed the impact area at an approximate 15° angle, slid 188 feet, and struck the 54-inch high concrete median divider. When the tanker struck the divider it ruptured and exploded. The case tractor rode up onto the median divider for approximately 150 feet, but was redirected onto the eastbound median shoulder where it came to rest and burned. At some point during the case tractor's contact with the divider, the cab came apart and the driver and driver's seat were ejected across the median divider, coming to rest on the westbound shoulder. It was not determined if the driver was restrained. The burning diesel fuel flowed approximately 760 feet back to the west and burned the median shoulder and concrete divider.

Beaumont, California
Case No. 55

The tractor/tanker combination unit was destroyed. The driver received moderate injuries from the impact, but died in the postcrash fire. The double combination unit received substantial damage and the driver received minor injuries.

Witnesses stated that when they passed the doubles combination unit it was travelling at about 43 mph and was smoking badly. They had travelled about 100 yards past this truck when they saw the explosion in their rear view mirror. They stated that the tanker truck exploded before it struck the median barrier. The witnesses also stated that they did not recall seeing any flashing caution lights on the rear of the double trailer combination unit.

The doubles driver stated that as he was driving east on Interstate 10 his turbocharger stopped working and he began to coast down the hill. He stated that he was travelling at about 45 mph when the other truck struck him. However, it was calculated that after the double trailer combination unit was struck, it departed the impact area at approximately 50 mph.

Metallurgical testing showed that the turbocharger failed due to a fatigue crack in the impeller wheel. The crack emanated from a compression mark on the impellar that resulted from being overtightened during the remanufacture of the turbocharger.

The 43-year-old tanker driver had 10 years of commercial driving experience and had 8 years of experience driving tanker trailers. He held a valid medical certificate and had 3 traffic violations and one accident on his driving record. Records showed that the driver had been on duty for 27.5 hours during the last 8 days, 14.5 hours during the preceding 72 hours, and 5.5 hours during the preceding 24 hours. On the night of the accident, the driver had travelled 177 miles from Ehrenberg, Arizona, to Colton, California, and was on the return trip when the accident occurred.

The tanker motor carrier received an unsatisfactory safety rating during a May 1985, audit by the Office of Motor Carrier Safety. As of May 1988, The Office of Motor Carrier Safety had not re-audited this carrier. The operations manager stated that the unsatisfactory rating resulted from the carrier's failure to keep accurate records during a period of large growth. He added that all records were now in order. The qualification files for the accident driver had no deficiencies.

The doubles combination driver had 9 traffic violations on his driving record and was on probation for being a negligent operator. Additionally, he had an expired medical certificate at the time of the accident.

Blood samples from the tanker driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.01 percent alcohol and 1,500 ng/ml of caffiene. No other drugs, as identified in the NTSB testing protocol, were identified.

Beaumont, California
Case No. 55

Blood samples from the fatally injured truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the tanker driver to perceive the closure rate between his vehicle and the vehicle ahead due to inadequate or ambiguous visual cues on the slow moving combination. Contributing to the accident was the slow speed of the doubles combination.

CASE NO.: 56

Investigation No.: NYC-88-H-TR09
Accident Location: Interstate 295, Bellmawr, New Jersey
Lanes: 6 lane divided
Shoulders: Right shoulder 10.9 feet, left shoulder 9 feet, asphalt surface
Median: 45-foot grass median with "W-beam" guardrail
Features: Level, approaching an interchange
Date and Time: March 3, 1988, 6:05 a.m.
Ambient Conditions: Clear, dry, dawn, 50° F
Heavy Truck Involved: 1985 International COE 3-axle tractor in combination with a 48-foot van trailer
Motor Carrier: Riss International
Type of Operation: Common Carrier
Size of Operation: 463 power units
Total Weight of Truck: Approximately 23,800 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: 1985 Mack tractor and flatbed trailer
Truck Fatalities: 1 **Truck Injuries:** 1
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

As the International combination unit was northbound on Interstate 295 approaching the interchange with Interstate 76, it drifted leftward off the highway and crashed into a "W-beam" median guardrail. The vehicle rebounded off the guardrail, reentered the highway, and struck a northbound Mack tractor and flatbed trailer. The International then jackknifed and collided again with the median guardrail. During the crash the unrestrained International driver was ejected and killed, and an unrestrained passenger was ejected and received minor injuries. Following the collision between the trucks, the uninjured Mack driver maneuvered his vehicle onto the right shoulder.

The speed limit for this highway was 55 mph and the International passenger indicated that the truck was traveling at about 45 mph when the crash occurred. The passenger stated that the truck had been in the center lane and that he had instructed the driver to move into the left lane in order to exit onto Interstate 76. The driver began to steer leftward but never straightened the truck once it was in the left lane. The passenger also stated that he shouted for the driver to straighten the truck, but the driver did not respond and appeared stiff. No precrash mechanical defects were discovered with the International and there were no truck tire braking marks located on the roadway. The driver had been operating the truck for about 10 minutes prior to the crash.

The International driver had suffered a heart attack and undergone arterial bypass surgery 6.5 months before the crash. This was the driver's first trip driving an articulated vehicle following his surgery, his first trip with this motor carrier, and his first trip driving a cab-over tractor in combination with a dry van trailer. The driver had 28 years of driving

experience with conventional tractors and tanker trailers, and although he had no formal training in truck operations, he had received a 1 million mile safe driving award from his previous employer. The driver had a history of heart disease and diabetes. The postmortem report indicated that he died as a result of arteriosclerotic cardiovascular disease.

Blood samples from the driver of the International were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from this driver were also tested at the request of the State of New Jersey with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was physical incapacitation of the International driver due to cardiac failure.

CASE NO.: 57

Investigation No.: DEN-88-H-TR07
Accident Location: U.S. Highway 395, 10 miles south of Walker, California
Lanes: 2 lanes, undivided
Shoulders: Asphalt, varying width
Median: None
Features: Mountainous "S" curves with 1 percent upgrade
Date and Time: March 3, 1988 at 9:50 p.m.
Ambient Conditions: Cloudy, dry, nighttime, temperature 45° F
Heavy Truck Involved: 1980 Peterbilt COE in combination with a loaded 42-foot flatbed trailer
Motor Carrier: Bill Kuhn's Trucking
Type of Operation: Contract Carrier
Size of Operation: 6 power units
Total Weight of Truck: 77,500 to 80,000 pounds
Total Length of Truck: 57 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 1
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The Peterbilt combination unit, loaded with processed lumber weighing between 77,500 and 80,000 pounds, was southbound ascending a series of "S" curves in Walker Canyon on U.S. Highway 395. Ten miles south of Walker, California, the truck completed one left turning curve and one right turning curve. As the truck transitioned into the second left turning curve, with a radius of 800 feet, the truck rolled over onto its right side and slid up against the mountain on the right side of the roadway. Prior to rolling over, the truck left a 183 foot, yaw-type, tire mark. After rolling over, the truck slid about 209 feet to a position of final rest up against the mountain.

The unrestrained truckdriver was thrown to the passenger side of the tractor and received fatal injuries. The unrestrained passenger received moderate injuries which required hospitalization. The tractor received substantial damage to the right front corner and right side of the cab. The flatbed trailer was not damaged. The lumber cargo was scattered along the roadway and among the truck wreckage. Pieces of the lumber struck the driver in the back and pinned him against the dash board. His body from the under arms and above was hanging outside the front of the cab.

A postcrash inspection of the Peterbilt combination unit revealed the tie-rod and steering arm connection on the left front wheel was worn and loose. This allowed a 3/4 inch up and down movement of the tie-rod when the steering wheel was rotated from side to side, and caused the steering wheel to move one third turn before the front tires would move. In addition, the left brake on the tractor's second axle was inoperative, and the air brake reservoir tank contained a quart of water. Push-rod travel was not checked on the tractor brakes as wrecker personnel backed off the brakes to remove the truck from the accident site.

Walker, California
Case No. 57

An investigation into the driver's activities prior to the accident revealed the driver had been active, without rest or sleep, for the 11 hours prior to the trip. The next 26 hours were involved in the trip, in which the driver was able to accumulate a total of three hours rest which was comprised of several short break periods. Based on these facts, it had been 37 hours since the driver awoke from his last full night of sleep.

An investigation into the driver's employment history revealed that he had been a truckdriver for the past 15 years. He had no formal truckdriving schooling. He was hired by his present employer on February 4, 1988, and had 20 days driving experience in the accident truck. A 50 state search of driving history revealed that the driver had a California, Class-1, drivers license, and had two speeding and one failure to appear convictions in the last three years. In August 1980, the driver was convicted of driving while intoxicated (DWI). The National Driver's Register (NDR) had no listing on the driver.

The motor carrier was a contract carrier regulated by the Interstate Commerce Commission (ICC) and subject to Federal Motor Carrier Safety Regulations. The carrier is authorized to transport metal products between points in the United States under a continuing contract with Stead Industries, Inc., d/b/a Hoyt Heater Company of Reno-Stead, Nevada, basically, from Huntington Park, California, to Reno, Nevada and return. The carrier fulfilled the ICC permit when hauling metal products from Huntington Park to Reno. After leaving Reno, the carrier's drivers usually went to Quincy, California, and obtained a load of lumber to be taken back to Huntington Park area. During their return to Huntington Park, the drivers crossed back into the State of Nevada for about 125 miles. On the return trip, the carrier was acting as an Interstate Common Carrier. The carrier filed for Common Carrier status in January 1988, however, as of March 30, 1988, that application was still pending. The company's files on the driver contained an employment application dated February 3, 1988, and a driver's violation history for California. The employer hired the driver without conducting past employer checks and without giving a written and road test. Documents submitted by the driver, from past employers, were accepted without being verified. As of March 15, 1988, the Office of Motor Carrier (OMC) had not conducted a safety audit of the carrier.

A past employer of the driver, Dedicated Trucking of Montebello, California, was contacted by this investigator. Mr. James Benson, Vice President, advised that this investigator was the first person to inquire about the driver's past employment with Dedicated Trucking. Mr. Benson advised that Mr. Armenta worked for Dedicated Trucking from April 1986 to February 1987, was considered a good employee and received a Safe Driving Award. In January 1987, Mr. Armenta's medical certificate needed to be renewed, and he was sent to CTA Driver Testing Center in Los Angeles. Mr. Armenta's blood test results came back positive for numerous illegal drugs. Since Mr. Armenta did not appear to be a drug user, the company thought that CTA made a mistake on Mr. Armenta's blood test and sent him back for a second blood test. The results were the same. Mr. Armenta acknowledged his use of illegal drugs and was fired from the company.

Walker, California
Case No. 57

The passenger stated that the driver never stopped to check the tie-down straps on the lumber after they departed the lumber mill. Also, the passenger stated that he occupied the sleeper berth most of the trip.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained salicylate (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from this driver were also tested at the request of the State of California. This test determined that the blood sample contained 20,900 ng/ml of salicylate.

The exact reason for the difference in salicylate concentrations reported by the two laboratories could not be established. However, the California laboratory did not have a standard close to measured blood concentration for salicylate. While the values are different by almost a factor of 2, both concentrations are at the lower end of the therapeutic range. Consequently, the difference is not significant.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. A contributing factor to the accident was the worn and loose connection of the tie-rod and steering arm on the truck's left front wheel which allowed excessive play in the steering wheel. Contributing to the severity of the accident was the lack of an adequate barrier between the load and the cab of the power unit.

CASE NO.: 58

Investigation No.: SEA-88-H-TR08
Accident Location: Flowing Wells Road at intersection with Southern Pacific Railway "main line," 4 miles east of Niland, California
Lanes: 1 lane (at crossing)
Shoulders: None
Median: None
Features: At grade, Railroad Crossing
Date and Time: March 3, 1988, 1:50 p.m.
Ambient Conditions: Daylight, sunny, clear
Heavy Truck Involved: 1967 GMC COE 3-axle tractor pulling a loaded 35-foot single axle flatbed trailer
Motor Carrier: Amber Steel Company, Inc.
Type of Operation: Private Carrier
Size of Operation: 20 power units
Total Weight of Truck: Approximately 37,000 pounds
Total Length of Truck: 50 feet
Other Truck Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

This accident occurred as Southern Pacific Railway freight train #1EXCHT02 was eastbound on the main line track and climbing a .5 percent grade at a recorded speed of 40 mph. The train was headed by a General Electric B-39 engine, 3 other engines, and 27 loaded "5 bay" articulated cars hauling steel containers. The total length of the train was 7,152 feet and it had a gross weight of 7,940 tons. The GMC tractor pulling the flatbed trailer was southbound on East Highline Canal Maintenance Road and had reached the juncture of Flowing Wells Road where it made a right turn onto the crossing. According to members of the train crew, the truck stopped at the crossing for about 15 or 20 seconds and then started across the tracks when the train was only about 100 to 150 feet from the crossing. (It is not known if the truck was at an angle or the driver experienced visibility problems. There is a 10 X 19 inch window behind the drivers seat.) The front of the first locomotive struck the trailer, pushing it eastbound. The kingpin broke off the trailer 5th wheel plate causing the trailer to separate from the tractor. The tractor rotated and the front of it came to rest facing east, 62 feet east of the east edge of Flowing Wells Road. The left front of the tractor was approximately 5 feet from the railroad tracks and left rear approximately 9 feet. As the train continued east with the engine in emergency braking, the train began to derail, causing a break in the continuous weld rail track and tearing up roadbed for approximately 600 feet. The lead locomotive came to rest about 1150 feet east of the crossing with the trailer attached to the front. This accident closed the main line to rail traffic for about 22 hours.

Niland, California
Case No. 58

The truckdriver was ejected during the collision sequence and came to rest approximately 15 feet west of the tractor. He received medical attention at the scene, but was pronounced dead about 30 minutes after the collision with the cause of death being "massive cerebral contusion." The tractor was not equipped with a seatbelt. None of the train crew were injured.

The lead locomotive was removed from the scene and not physically inspected by NTSB personnel. An examination of photographs taken by the County Sheriff and the highway patrol revealed damage to the front coupling and cowling area. There were indentations along the right side of the locomotive just below the walk railing and approximately 20 feet from the front of the engine.

The tractor sustained damage to the left front and side. Both front windshields were displaced. The bumper was knocked off, both headlights broken, and the right front wheel was canted inward. The rear drive axle was displaced and several of the leaf springs broken. A complete mechanical examination of the tractor was not done due to the circumstances surrounding the accident. The 35-foot trailer was severely bent and destroyed in the collision, as it was pushed up the tracks approximately 1150 feet after being struck by the lead engine. The kingpin from the trailer 5th wheel plate broke off and remained in the "coupling jaws" of the tractor 5th wheel.

The main line in this vicinity was a single set of tracks where it intersects with Flowing Wells Road. The crossing itself was approximately 14 feet wide and could generally accommodate only "one way" traffic. Officials from Imperial County Department of Public Works related that the average daily traffic for this roadway was about 50 vehicles per day. The only warning sign in place at the time of occurrence was an ordinary octagonal "stop sign" for northbound traffic. It is unknown how long the warning sign for southbound traffic was not in place. According to a supervising engineer from the California Public Utilities Commission, an inspection of the crossing in April of 1979 revealed two "stop signs" in place, both noting "private crossing." A U.S. Department of Transportation inventory designates the crossing "private," although it is on a publicly traveled road. According to Southern Pacific timetable, the westbound speed limit in this vicinity was 70 mph for both freight and passenger trains. The eastbound speed limit was 70 mph for passenger and 65 mph for freight.

The driver of the truck was a member of the ironworkers union and driving the truck was only a small part of his job. According to a coworker, this was the drivers second day at this site and he may have crossed the tracks only one or two times previously. The company president, who was also the 25 year old driver's grandfather, related that he had driven trucks for the company for one year and had a maximum of 5,000 miles experience. The company president also stated that most of this time could be considered "in training," as he was usually with another driver.

Niland, California
Case No. 58

The engineer related to the investigating officer from the California Highway Patrol that the truck stopped about 15 feet north of the crossing and remained stopped for about 15 seconds, and that "when the train was 100-150 feet from the crossing, the truck started forward toward the tracks." According to the conductor's statement to the Highway Patrol, the truck stopped about 20 feet prior to the tracks and remained stopped for 15 to 20 seconds. Then "when the train was 40 to 50 yards (120 to 150 feet) from the crossing, the truck started to go across."

Based on the engineer's and conductor's observations of the train being 100-150 feet from the crossing when the truck started to move forward, the time it would take a train, traveling at 40 mph (58.8 feet per second), to travel this distance was calculated to be between 1.7 and 2.5 seconds. The tractor and trailer were 50 feet long, and according to the train crew, the tractor was stopped about 15 to 20 feet north of the crossing. By using an acceleration formula, a vehicle moving from a complete stop and traveling 35 feet in 2.5 seconds would have attained a speed of 19 mph. If it traveled 35 feet in 1.7 seconds, it would have attained 28 mph. If it went 40 feet in 2.5 or 1.7 seconds from a stop, it would attain speeds of 21 and 32 mph, respectively.

The driver held only a Class 3 California driver's license which did not qualify him to operate a combination vehicle. According to the company president, he had applied for a Class 1 permit. A 3 year record check with the California Department of Motor Vehicles revealed 3 moving violations (1 speeding, 1 reckless driving, and 1 driving under the influence). A National Driver Registry check revealed him being suspended in California for Driving Under the Influence from May 1985 until February 1987. A 50 state check revealed that he held only a California license.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 160 ng/ml of benzoylecgonine (metabolite of cocaine) and 1,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This test reported that the blood sample contained 299 ng/ml of cocaine and/or its metabolite. This analysis was performed by RIA and gas chromatography. A toxicologist at Reference Laboratories related to NTSB personnel that they used only a screening technique. The value reported at that laboratory was not confirmed by a second independent test, as was done at the Center for Human Toxicology. Since an independent gas chromatograph/mass spectrometry technique was not used to verify the value obtained, this 299 ng/ml value cannot be considered quantitative.

Niland, California
Case No. 58

PROBABLE CAUSE:

The National Transportation Safety Board determines the probable cause of this accident to be the impairment of the truckdriver due to his use of cocaine. Probably contributing to the accident was the driver's inexperience with heavy trucks.

CASE NO.: 59

Investigation No.: CHI-88-H-TR09
Accident Location: U. S. Route 41/141, Abrams, Wisconsin
Lanes: 4-lane divided highway
Shoulders: 5-foot wide gravel shoulders
Median: 25-foot wide grass median
Features: Straight roadway with a -8 percent grade
Date and Time: March 10, 1988, at 10:16 a.m.
Ambient Conditions: Clear, dry, daylight, about 45°F
Heavy Truck Involved: 1985 Mack conventional tractor in combination with a loaded tanker trailer
Motor Carrier: Stropich Oil Company
Type of Operation: Private Carrier
Size of Operation: 1 power unit
Total Weight of Truck: Approximately 78,500 pounds
Total Length of Truck: 55 feet
Other Vehicle Involved: A 1980 GMC stake truck
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The combination unit was traveling northbound on U. S. Route 41 in the right traffic lane at a witness estimated speed of about 55 mph. The unit was approaching Oak Orchard Road when a southbound GMC stake truck turned left from U. S. Route 41 onto Oak Orchard Road. The stake truck crossed the median and began crossing the northbound lanes of U. S. Route 41. The combination veered right into the right turn lane while activating its brakes. The combination was midway into the intersection when the front of the stake truck impacted the left side front tire, fender and door of the combination unit. After the initial impact the left side tandem drive axle tires of the combination impacted and overrode the right front fender and axle of the stake truck.

Following the collision the vehicles separated; the GMC stake truck rotated about 230° counter clockwise while skidding 65 feet to the north. The unit's final rest position was facing a southwesterly direction in the northbound traffic lanes of U. S. Route 41. The combination continued veering to the right over the concrete curb of the northeast corner of the intersection and onto the grass roadside, where it rolled over onto its right side, roof, and left side. The unit's final rest position was on its left side facing a northeasterly direction about 260 feet from the initial impact.

The collision resulted in extensive damage to both vehicles. The unrestrained driver of the combination was fatally injured when the tractor roof crushed inward and rearward during the rollover sequence. The restrained driver of the stake truck was seriously injured.

Information furnished by the combination driver's carrier indicated their driver had about 35 years of truck driving experience, and about 2 years of driving experience in the accident vehicle. His driver training consisted of

Abrams, Wisconsin
Case No. 59

ride along experience with his parents, both professional over-the-road drivers. A search of the driving history through the NDR, 50 state license check, and previous employer revealed the driver was operating with a valid Michigan chauffeur's license. The records do not reflect any reported traffic accidents or traffic offenses. The carrier has been in operation for about 16 years, yet they failed to obtain/maintain any records on the driver or vehicle as required by Federal or State regulations.

A postcrash inspection of the combination found the unit in generally good repair. The only deficiency noted was a defective (corroded) exhaust system stack. Approximately 200 gallons of oil escaped from the tanker trailer of the combination as it lay on its left side at final rest.

The police investigating the accident requested the driver of the farm stake truck take a breath test (using a hand held intoxilizer) while at the accident site. The driver consented; the tests were negative for alcohol.

According to statements from the Oconto County Coroner the driver of the farm stake truck was required to retake the Wisconsin Driver's Test following this accident to retain his Wisconsin driver's license. He passed the test; however, shortly afterward he was involved in another fatal collision with a motorcycle. The circumstances of the second fatal collision were similar to those of the case accident. A postaccident examination of this driver revealed he has tunnel vision.

Blood samples from the truckdriver were submitted to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,900 ng/ml of caffeine. No other drugs, as defined by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Wisconsin with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Chevrolet driver's failure to yield right-of-way to the Mack combination due to a vision deficiency (tunnel vision). Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 60

Investigation No.: DEN-88-H-TR08
Accident Location: Geary Road and Pleasant Hill Road, Pleasant Hill, California
Lanes: 4-lane undivided
Shoulders: 5-foot asphalt with curb
Median: None
Features: Intersection, right hand curve
Date and Time: November 6, 1987, 2:36 p.m.
Ambient Conditions: Cloudy and dry
Heavy Truck Involved: 1973 Ford C800 flatbed dumptruck with a loaded 18.5-foot 2-axle trailer
Motor Carrier: Brennan Core Drilling
Type of Operation: Private Carrier
Size of Operation: 2 power units
Total Weight of Truck: 33,455 pounds estimated
Total Length of Truck: 43 feet 6 inches
Other Vehicle Involved: Passenger vehicles
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 2

FACTUAL SUMMARY:

The combination unit was traversing an approximate 1 percent downgrade on a straight section of road through a traffic light controlled intersection. There is a slight right hand curve east of the intersection. As the vehicle approached this area, it started to slide to its left leaving 231 feet of yaw marks. The trailer crossed the centerline and struck vehicle #2, which was westbound. The truck continued in an easterly direction and struck the rear of vehicle #3, which was eastbound. The truck and trailer then rolled on to its left side, slid across the westbound traffic lanes and off the north side of the road to where it struck a tree. A range of speeds from 50 to 85 mph were given by witnesses of the truck at the time of the accident. The roadway for eastbound traffic, approaching the intersection, was four lane, divided, with a turn lane. The roadway tapered down to two lanes, undivided on the east side of the intersection. The intersection was controlled by traffic lights, an intersection warning sign, and a 35 mph speed limit sign for eastbound traffic approaching the intersection.

This accident resulted in fatal injuries to the unrestrained driver of the combination unit. The driver and passenger in vehicle #3 received minor injuries. The dumptruck and trailer were destroyed with moderate to heavy damage to the other vehicles involved in the accident.

The driver's normal duty was the operation of heavy construction equipment used in the company's paving and pavement repair business. The driver had no formal training in the operation of heavy trucks, but had been driving dump trucks for the past three years, as a part of his duties as a construction worker. A fellow employee stated that the driver did not normally have a trailer attached when he drove the type of truck which was involved in the accident. The driver had a valid California class 3 drivers

license with no history of violations and one accident in the last three years. A class 3 license does not cover the operation of the vehicle type he was operating at the time of the accident.

The investigation revealed that the company had no training program for their drivers and no maintenance program for their vehicles. A check of the records revealed that the company had not been audited by the DOT or California State PUC before the accident.

Witness speed estimates ranged from 50 to 85 mph. No skidmarks which could be associated with the accident vehicle were found. Post accident inspection of the vehicle by the Pleasant Hill Police Department revealed about one quart of liquid in each of the wet and dry air tanks. The right rear brake chamber on the truck had an air leak when tested and the electrical brake system on the trailer did not function at the time of the inspection.

The Pleasant Hill Police Department furnished test results which showed an average coefficient of friction of .66 for the asphalt road surface where the accident occurred. The road surface was dry at the time of the accident and the test.

There were no toxicological samples from this driver sent to the Center for Human Toxicology for analysis.

Blood samples from the truckdriver were tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the lack of a functioning brake system on the truck due to inadequate maintenance. Contributing to the accident was the driver's inexperience with heavy trucks. Contributing to the severity of the accident was the inadequate cab structure of the truck.

CASE NO.: 61

Investigation No.: SEA-88-H-TR09
Accident Location: Interstate 5, Del Mar, California
Lanes: 8 lane divided
Shoulders: Right, 10 feet, asphalt
Left, 10 feet, asphalt
Median: Approximately 40 feet
Features: At grade, under bridge
Date and Time: March 16, 1988, 1:25 p.m.
Ambient Conditions: Daylight, sunny, dry
Heavy Truck Involved: 1980 Lorain, Model MC-1650, crane trailed by a 1987 "Shop Made" dolly
Motor Carrier: Marco Crane and Rigging Company
Type of Operation: Crane and rigging company
Size of Operation: 16 power units (14 cranes and 2 tractors)
Total Weight of Truck: 131,000 pounds
Total Length of Truck: 75 feet
Other Vehicle Involved: 1968 Volkswagen Beetle
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

This accident occurred as the Lorain crane was traveling north on Interstate 5. The crane had just come up a 1 mile hill with a 3 percent grade and was traveling beneath a bridge that was under construction. When traveling under the bridge, the crosshaft of the "back hitch gantry" struck and made indentations on 2 large I-beams. It struck and engaged the 3rd I-beam, knocking it off its supports. The right end of the beam fell on top the crane cab, crushing the cab and killing the driver. The front of the 83 foot long 22,000 pound I-beam was carried approximately 150 feet from its original position before coming to rest. The other vehicle, a 68 Volkswagen, sustained only minor damage as the I-beam grazed the roof of the car. The car was driven from the scene and the driver uninjured.

An examination of the crane at the scene by the California Highway Patrol revealed that the "back hitch gantry" locking pins were in the locked position, but were outside the "locking bar" rather than inserted into the pin holes, thus leaving the "back hitch gantry" in an unsecured position. This was documented photographically at the scene by the Highway Patrol.

When the crane is being disassembled and prepared for highway travel, the "back hitch gantry" must be lowered and the "gantry arms" secured to the "crane house." This is accomplished by the crane operator activating an air valve which inserts the "locking pins" into two parallel vertically situated steel "locking bars" mounted on the rear (front, when in highway travel mode) of the "crane house." When the "locking pins" are moved into the "Pin In" position, a sliding indicator rod located inside the "crane cab," called the "Gantry Pin Indicator," moves to the "Pin In" position, indicating to the operator that the "back hitch gantry" is secured. The "Gantry Pin Indicator"

Del Mar, California
Case No. 61

does not actually show whether the "locking pins" are inserted through the pin holes on the "locking bar," but only whether the "locking pins" are "in" or "out." A visual inspection must be made to actually determine that the "locking pins" penetrated the pin holes, thus securing the "back hitch gantry."

Beneath the outer support arms are two hydraulic pistons, commonly referred to as "rams." The "rams" are used to raise or lower the "back hitch gantry" for actual crane operation. Without being secured by the "locking pins," the gantry would be free to rise during transit, should there be any upward pressure. In this occurrence, the "rams" were found at the accident site to be extended upward approximately 11 inches from their normal seated position, thus making the crosshaft section at the rear (front, when in highway travel mode) of the gantry even higher.

The investigation revealed that on the morning of this accident, the crane company was dismantling the crane at a job site near San Diego. According to the crane operator, the driver of the crane (who was fatally injured in this accident) was watching the gantry being lowered against the locking bar and gave tne crane operator a signal indicating the "back hitch gantry" was secured. The crane was being transported to another job site approximately 25 miles away and had been driven about 10 miles when the accident occurred.

The bridge that was under construction had a warning sign stating "Vertical Height 14 feet, 6 inches." The maximum allowable height without a permit in California is 14 feet. The normal height for this crane when in transit would be 13 feet, 6 inches. The approximate height of the I-beam where it was struck by the crosshaft of the "back hitch gantry" was 15 feet 5 inches. According to a Cal Trans project engineer, the height from the roadway to the bottom of the involved I-beam was 14 feet 8 inches. The engineer also stated that the "Vertical Height, 14 feet 6 inches" sign had been in place since February 25 of the prior month.

The driver had a total of 10 years experience in driving and operating heavy cranes. He held a current Class 1 California driver's license, and in the past 3 years did not have any recorded traffic violations or accidents. A 50 state check revealed that he had only a California driver's license and a NDR (National Driver's Registry) check revealed that he had not been under suspension in any reporting state.

The driver had what appeared to be a valid D.O.T. Medical Certificate in his possession. The certificate recorded his most recent physical examination to be in December 1986 by Dr. Juan Suros, 480 4th Avenue, Chula Vista, California. When the NTSB investigator visited the office of Dr. Suros, it was learned that he was a thoracic and cardiovascular surgeon and did not give D.O.T. physicals. The physician's office had no record of the driver ever visiting him. The carrier did not have a copy of the D.O.T. Medical Certificate in the driver's file. The carrier also did not have a permit to move the overweight and overwidth crane on the roadway.

Del Mar, California
Case No. 61

Blood samples from the crane driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 750 ng/ml of methamphetamine and 190 ng/ml of amphetamine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the crane driver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 190 ng/ml of methamphetamine and 50 ng/ml of amphetamine.

The two laboratory findings for both drugs identified differ by almost a factor of 4, suggesting a systematic error. Discussions with the staff of the California laboratory show that, because of sample size limitations, dilutions were made. Thus, it is presumed that a dilution error was made although such a conclusion could not be verified from laboratory records.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the crane driver to insure that the "back hitch gantry" was properly secured due to his impairment from the use of methamphetamine and/or amphetamine.

CASE NO.: 62

Investigation No.: CHI-88-H-TR10
Accident Location: I-94 westbound lanes, at milepost 85, in Eau Claire County, Wisconsin
Lanes: 4 lanes, divided highway
Median: Grass covered
Features: straight roadway at hillcrest with 10 foot shoulder
Date and Time: March 16, 1988, 11:30 p.m.
Ambient Conditions: Dark, unlighted roadway, clear, dry
Heavy Truck Involved: 1984 International tractor in combination with an empty 45-foot refrigerated van trailer
Motor Carrier: Randall Trucking, Inc.
Type of Operation: Common Carrier
Size of Operation: 4 power units
Total Weight of Truck: Approximately 27,840 pounds
Total Length of Truck: Approximately 56 feet
Other Vehicle Involved: 1980 Mack COE tractor in combination with a loaded refrigerated van trailer

Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The International combination unit was traveling west on a straight section of roadway at the crest of a small hill, when it exited the right side of the travel lanes onto the shoulder and struck the rear of an illegally parked Mack combination vehicle. The Mack tractor was separated from the Fruehauf trailer it was coupled to by the collision, and came to rest on the roadway approximately 99 feet west of the impact location. Following the impact, the International combination exited the right shoulder and came to rest in the roadside ditch. The Fruehauf trailer of the Mack combination vehicle was pushed into the roadside ditch ahead of the International vehicle. A small fire occurred following the collision.

This accident resulted in fatal injuries to the unrestrained driver of the International vehicle, and minor injuries requiring hospitalization to the driver of the parked Mack vehicle who was in the cab sleeper berth at the time of the collision.

The International driver had approximately four months of experience driving combination vehicles. According to his wife, the driver had little experience operating combination vehicles before his employment by this motor carrier on 11-14-87, and received no training from the company. She stated that the night of his expected return (3-16-88), was to have been the first night in a new apartment for their family.

A witness observed the Mack combination unit parked on the shoulder at the accident scene at approximately 10:55 p.m. with only the parking and clearance lights illuminated.

Eau Claire, Wisconsin
Case No. 62

The log book pages of the International driver for the dates from 3-13-88 to the date of the accident were not found following the accident. The driver's log book pages for the dates 3-01-88 to 3-08-88 and 3-10-88 to 3-12-88 were obtained from the motor carrier. The January, February, and March 1988 log book pages of this driver have no entries of miles driven.

The company owner stated that the driver had made this 700 mile round trip to Ohio often, and usually stopped in Mauston, Wisconsin, on the return trip for the eight hours of off-duty time required by the DOT driver's hours of service regulations. However, on the accident trip he had travelled over 1300 miles in the 2 days preceding the accident. From a review of old log books, it was found that the driver routinely put in 10 to 13.5 hours per day.

A Motor Carrier Safety Inspection Report found in the cab of the International tractor documented a roadside inspection on March 2, 1988, and listed 7 violations, including 4 out-of-service violations, for a 1977 International tractor, designated as #9, and the same Great Dane trailer involved in the March 16, 1988 accident. The inspection report was signed by the inspecting Wisconsin State Patrol officer and the International driver.

The driver's daily log page for March 2, 1988, contained no notations of the time consumed by the inspection, or the time occupied by the repairs needed to bring the inspected vehicle back into service. The driver marked the block labeled "I detect no defect or deficiency in this motor vehicle as would be likely to affect the safety of its operation of result in its mechanical breakdown." referring to tractor #9 on the March 2, 1988 log book page.

A 50 state check of the International driver's operator license revealed a single, valid, Wisconsin license with no violations or suspensions.

Blood samples from the International driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the International driver were also tested at the request of the State of Wisconsin with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the International driver due to fatigue.

CASE NO.: 63

Investigation No.: SEA-88-H-TR10
Accident Location: Interstate 5 at Tamarack overcrossing, Carlsbad, California
Lanes: 8 lanes, divided
Shoulders: Outside shoulder 10 feet of asphalt
Median shoulder 14 feet of asphalt
Median: Approximately 30 feet of grass and bushes
Features: Depressed, straight, 1 percent upgrade
Date and Time: March 21, 1988, 1:20 p.m.
Ambient Conditions: Clear, daylight, dry, and 75° F
Heavy Truck Involved: 1972 Ford F-600 flatbed fully loaded with about 900 rabbits
Motor Carrier: El Monte Rabbit Company
Type of Operation: Interstate, private
Size of Operation: 6 power units
Total Weight of Truck: 11,500 pounds
Total Length of Truck: 22 feet 7 inches
Other Vehicle Involved: 1963 White Freightliner COE in combination with a loaded 40-foot container trailer

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The 1972 Ford F-600 flatbed was traveling north on Interstate 5 at a witness estimated speed of 50 mph. Just after the Ford passed under the overcrossing for Tamarack Avenue, it veered off to the right, onto the shoulder, and struck the rear of a parked trailer in combination with a tractor. The tractor and trailer were pushed straight down the shoulder for 10 feet, and the Ford flatbed came to rest behind the trailer after rotating about 10° in a counterclockwise direction. All wheels on the right side of the Ford were found on the vegetation side of a six inch high asphalt curb on the outside of the shoulder. The unrestrained driver of the Ford received fatal injuries, and was found pinned, sitting upright in the driver's seat. The driver of the parked combination vehicle was outside of the tractor and had just switched fuel tanks before the impact. He stated that he did not see the Ford approaching.

The front of the Ford experienced extensive rearward crushing except for 32 inches on the right front area. The maximum crush was measured at 58 inches. When the interior was examined it was noted that there were 12 inches between the driver's seat back and the instrument panel. Only the rear of the trailer on the combination unit was damaged.

The damage to the front of the Ford was so severe the a complete examination of the steering, braking, and suspension systems was not possible. A bias ply tire was found on the right side of the steering axle, while all of the remaining tires were radials. The carrier stated that the tires on this wheel had been wearing unevenly, even after it had been realigned.

Carlsbad, California
Case No. 63

The driver of the Ford operated in intrastate transportation, but did not keep a log book or have a medical certificate as required by California. When the carrier was questioned about this he stated that he was going to start having his drivers use log books. Due to the lack of log books and detailed information from people who knew the driver of the Ford, it was not possible to reconstruct his last 72 hours. He had been separated from his wife for the last nine months, and had been living with his brother. The brother stated that the driver had slept for five hours and 15 minutes the night before the accident, and had gotten up at 3:15 a.m. The previous night he slept for 10 hours and 15 minutes. When the carrier was interviewed, he stated that he thought that the Ford driver was also employed by a restaurant in the area delivering food. Neither the brother nor the driver's wife would verify the statement, so this could not be determined.

Blood samples from the Ford driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,900 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Ford driver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Ford driver due to fatigue.

CASE NO.: 64

Investigation No.: DEN-88-H-TR09
Accident Location: U.S. Highway 6, 7 miles west of Golden, Colorado
Lanes: 2 lane undivided
Shoulders: Dirt and sand, varying width
Median: None
Features: Mountainous "S" curves with 1 percent upgrade
Date and Time: March 28, 1988, 7:25 a.m.
Ambient Conditions: Snowing hard, temperature 25 - 30°F
Heavy Truck Involved: 1986 Freightliner in combination with a loaded 42-foot tanker trailer
Motor Carrier: Petro, Incorporated, Interstate
Type of Operation: Common Carrier
Size of Operation: 123 power units
Total Weight of Truck: 74,270 pounds
Total Length of Truck: 57 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The 1986 combination unit was westbound on U.S. Highway 6, loaded with 7,500 gallons of diesel fuel, ascending through a series of "S" curves in Clear Creek Canyon. Witnesses reported that it was snowing hard, which at times reduced visibility to near zero. Seven miles west of Golden, Colorado, the truck completed several left and right curves. As the truck entered a left turning curve, with a radius of 409 feet and no guardrails; the right tires went off the right side of the roadway, off the right shoulder, and over the 50 to 60° creek embankment adjacent to the shoulder. The left tires stayed on the right shoulder. The truck continued in this position for 156 feet before the truck rolled over onto its right side, down the embankment, and into Clear Creek that parallels the highway. The truck rolled one and a quarter times and came to rest on its right side, in the middle of the creek, in about two feet of water. The ending tire marks were 90° to the rest of the tire print showing where the left front tire was pulled sideways across the soft shoulder and dragged over the embankment just prior to the truck rolling over.

The unrestrained truckdriver was pinned in the tractor wreckage on the passenger's side, submerged under water, and died at the scene. The coroner listed the official cause of death as drowning. The tractor sustained substantial damage. During the roll down the rocky embankment, the trailer sides were punctured and the diesel fuel cargo spilled into the water.

A postcrash inspection of the Freightliner combination, performed jointly by the investigating police agency and NTSB, revealed no evidence of preaccident failure or deficiencies.

An investigation into the fatally injured driver's employment history revealed that he had been a truckdriver for the past 40 years. He had no

Golden, Colorado
Case No. 64

formal truckdriving schooling. He was hired by his present employer on April 22, 1987. Prior to this, he was driving his own trucks as an owner/operator hauling for different carriers. A search of the driver's history records revealed four traffic violations in the last three years. One citation was for speeding and the other three were for over weight vehicles. The records listed one accident involvement in the same time period. The National Driver's Register (NDR) had no listing on the driver. An examination into the driver's activities for the 72 hours preceding the accident revealed nothing significant to the circumstance of this accident.

The motor carrier was a common carrier regulated by the Interstate Commerce Commission (ICC), and subject to Federal Motor Carrier Safety Regulations (FMCSR). The Office of Motor Carriers conducted a safety audit on the carrier, which resulted in a satisfactory rating being issued on June 8, 1987. Carrier files concerning drivers, maintenance, and training met the FMCSR requirements.

Blood samples from the truckdriver were sent to the Center for Human Toxiclogy (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Colorado. This analysis determined that the blood sample contained 200 ng/ml of acetaminophen (analgesic).

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's loss of roadway reference due to heavy snow. Contributing to the accident was the lack of guardrails. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 65

Investigation No.: MKC-88-H-TR08
Accident Location: Howell Mountain Road, Pope Valley, California
Lanes: 2-lanes
Shoulders: 1-foot both right and left sides
Median: None
Features: Mountainside, 6-percent downgrade
Date and Time: March 22, 1988, 10:30 a.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1980 Ford F-9000 pulling a Champ rough terrain fork lift
Motor Carrier: Gypsum Wallboard Supply
Type of Operation: Private Carrier
Size of Operation: 5 trucks
Total Weight of Truck: 55,530 pounds
Total Length of Truck: 54.5 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination was negotiating a section of Howell Mountain Road, a winding downgrade of 6 percent with a superelevation of 7-percent. As the driver was negotiating a right curve, the truck traveled onto the right shoulder and struck a tree. The truck then rolled onto its left side and struck another tree. The forklift broke loose from the truck. Due to the failure of the air/hydraulic brake system on the fork lift, it traveled off the roadway and came to rest on its wheels in the creek.

As the truck rolled onto its left side, the left top of the cab came in contact with a tree. This collapsed the cab down into the drivers seat area. This accident resulted in fatal injuries to the unrestrained driver. The cab of the truck sustained substantial damage. However, the only damage to the forklift was the eye on the tow bar which was broken off.

This driver had been with this company for three years and four months. His application for employment showed no other driving experience. However, the company safety director indicated that he had driven concrete mixer truck for two years prior to coming to work for this company. This driver had not reported any traffic violations or accidents to the carrier. However, his motor vehicle record indicates that he had three minor violations. One on November 7, 1985, one on December 4, 1985, and another one on June 1, 1987. There was no restrictions on his operator license.

This truck was equipped with a rigid pintle hook with an air plunger that serves as a slack adjuster and shock absorber between the hitch and the eye of the draw bar on the forklift. The air supply for the plunger was provided by the air supply line for the trailer. This line had a "T" connection just forward of the gladhand. Air from another vehicle was used

to check the air brake system on the forklift. However the valve that switches the hydraulic system to air operation for towing would not allow the air to flow through the system.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,600 ng/ml of methamphetamine, 130 ng/ml of amphetamine, 9 ng/ml of the psychoactive component of marijuana (THC), 174 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 5,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 1,870 ng/ml of methamphetamine, 130 ng/ml of amphetamine, and 4,700 ng/ml of salicylate (aspirin).

The values obtained for methamphetamine and amphetamine from the two laboratories are in agreement within the expected uncertainties. The California laboratory did not test for marijuana and caffeine. The Center for Human Toxicology used a salicylate testing cut-off of 10,000 ng/ml. Therefore, salicylates were not reported by the CHT.

PROBABLE CAUSE:

The National Transportation safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to his use of drugs; methamphetamine and/or amphetamine and marijuana. Contributing to the accident was the lack of brakes on the trailing unit.

CASE NO.: 66

Investigation No.: MKC-88-H-TR09
Accident Location: State Highway 155 and Seaboard System Railroad Overpass, Nashville, Tennessee
Lanes: 4-lane divided
Median: Grass median
Features: Rolling hills and curves
Date and Time: March 31, 1988, 3:05 p.m.
Ambient Conditions: Clear, dry and daylight
Heavy Truck Involved: 1986 COE GMC tractor in combination with two loaded 28-foot van trailers
Motor Carrier: Yellow Freight System, Inc.
Type of Operation: Common
Size of Operation: 9,634 power units
Total Weight of Truck: 76,971 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: None

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

A GMC tractor in combination with twin trailers was proceeding around a curve when the tractor went off the roadway onto the outside shoulder. The driver applied his brakes and left 89 feet of skid before striking the guard rail on the edge of the shoulder. The tractor and trailer were in contact with the guardrail for 142 feet before going over the guard rail. The tractor and trailers then travelled 143 feet before striking a railroad bridge pillar. Upon impacting the pillar, the tractor stopped momentarily, but the twin trailers continued on, pushing the tractor around into a jackknifed position between the pillar and the end slope. As the tractor came around, the right wheel struck the pillar. The twin trailers continued to push the tractor until the first trailer broke in half. Then the tractor and the front half of the first trailer flipped over. The rear half of the first trailer and the second trailer rammed into the truck and the front half of the first trailer then rolled over on their right side. The front trailer was carrying two batteries filled with acid, identified by the shipping papers as UN 2794--the trailer displayed corrosive placards. The second trailer was carrying one cylinder each of carbon monoxide and carbon dioxide--this trailer was placarded with non-flammable gas placards. There was some spillage from the batteries, but the spillage caused no danger to anyone in this accident.

The tractor was destroyed upon impact. The first trailer was destroyed when the trailer broke in half. The converter dolly and second trailer received moderate damage. The Safety Board investigator could find no evidence that the fatally injured driver was using any restraint system.

This driver retired as a railroad brakeman in August 1976. In October 1976, the driver went to work as a road driver for Wagner Brothers Trucking

Nashville, Tennessee
Case No. 66

Company and had driven a truck until his employment with Yellow Freight System Inc. The driver went to work for Yellow Freight System. Inc. with a valid Illinois driver license with one violation for improper backing on his record. A check with the Illinois Department of Revenue revealed that the driver was involved in an accident in July 1985.

A check with the driver's personal file found that the driver was notified that his Department of Transportation physical was due, and that he acknowledged the notification on January 8, 1988. The driver sent in a urine sample to be analyzed for the presence of alcohol and/or controlled substance on February 12, 1988, as per company policy. Also in the driver's file was an undated physical examination report. The doctor had neither printed his e nor listed his office addrress, as required by regulations.

Copies of the driver's logs from March 1, 1988, until March 31, 1988, were obtained from the truck at the scene of the accident. These log records were compared to records for the same time period furnished at a later date by the carrier--the records did not match. The driver's log for March 12. 1988, that were obtained at the accident indicated that the driver did not complete his log for that day, but the log from the company indicated that the driver went off duty at 10 a.m. for the rest of the day. On March 18, 1988, the driver's logs that were obtained at the scene indicated that the first entry for that day was at 3:30 a.m. when he started driving, but when compared to the log's that the company sent, the driver was off duty from midnight until 3:30 a.m. On both sets of logs, the driver did not complete his daily logs for March 6 and 27.

A reconstruction of the driver's activities revealed that the driver routinely worked long hours; 8 a.m. to 7 p.m., 9 a.m. to 9 p.m., etc. On the date of the accident, he had began work at 4 a.m. after a full day off. At the time of the accident, he had been on-duty for over 9 hours and had driven approximately 600 miles since his last stop. Based upon the long hours and sleep cycle disruptions, it is probable that fatigue was a factor in the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue.

CASE NO.: 67

Investigation No.: MKC-88-H-TR10
Accident Location: Interstate 40, 2/10 mile east of Kingston, Tennessee
Lanes: 4-lanes divided
Shoulders: Right, 10.9 feet; left, 4.25 feet, both asphalt
Median: 24-Foot grass median
Features: 6 percent downgrade
Date and Time: April 9, 1988, 2:30 a.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1986 COE International tractor in combination with a loaded 48-foot van trailer
Motor Carrier: Schneider National Carriers, Inc.
Type of Operation: Common Carrier
Size of Operation: 2406 power units
Total Weight of Truck: 70,739 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 1
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was traversing an approximate 6 percent downgrade at the end of a curve, when the driver traveled onto the shoulder and across a ditch onto an approximate 32 percent upgrade embankment. The unit then came down the embankment on top of a guardrail, pulling the anchor from the ground. The unit rolled over onto its right side and skidded down a 43 percent embankment before coming to a stop. The tractor travelled approximately 453 feet after leaving the roadway. Witnesses stated that they had been following the accident truck for several miles at a speed of 60 to 65 mph, when all of a sudden, it veered from the driving lane onto the shoulder.

The unrestrained driver and the unrestrained sleeper berth passenger were ejected from the cab of the tractor. The fatally injured driver was found under the trailer. The passenger was found with her left leg amputated. Her right leg was trapped between the ground and the cab of the tractor. The tractor and trailer received substantial damage to the right side.

The driver had no formal truckdriver training. His driving record indicated only two speeding violations and they were in 1983. The driver had been a full-time truck driver since being employed by Schneider National Carriers, Inc. on December 9, 1986. On his application for employment, he stated that he was employed as a truck driver for a circus for six years. But, he only drove a truck one day a week and the rest of the week he ran the Ferris wheel.

The accident truck in this accident had an on-board computer, as required by the motor carrier. A Service Team Leader from Schneider National Carriers, Inc., West Memphis, Arkansas, office came to the scene of the accident and

retrieved the data from the truck's computer. When the Safety Board attempted to get this information, the Accident Claims Manager in Green Bay, Wisconsin indicated there was no data. He stated that the machine that was to retrieve the information did not work or the computer was broken during the accident. A check was made with the company that makes the computer about the possibility that the computer quit working during the accident and lost all of its information. The computer company stated that chances of it not working or that it would lose its information during the accident was less than one percent.

The driver's wife, a passenger, stated that they had left Crossville, Tennessee, at 10 p.m. April 7, 1988, and that the driver never went to sleep while she was travelling with him to Dayton, Ohio, and back to where the accident occurred 28.5 hours later. The company did not have a letter of authorization for the driver to have any passengers in his vehicle.

The driver's record of duty status for 31 days prior to the accident indicated that on March 2, 1988, the driver drove more than 10 hours and was on duty for more than 15 hours without being off duty 8 consecutive hours. The driver's daily logs indicated that the driver had to drive at an average speed greater than the speed limit on at least six occasions for the driver to get from one location to another in the time that he logged. On three occasions the driver had to average a speed of 68 mph and on three other occasions he had to drive an average speed of 75, 90, and 94 mph.

Vitreous samples from the truckdriver were sent to the Center for Human Toxicology (CHT) fot screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were not conducted by the State of Tennessee.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 68

Investigation No.: ATL-88-H-TR09
Accident Location: Interstate 85, 7.2 miles north of Commerce, Georgia
Lanes: 4 lanes, divided
Shoulders: Left, 4 feet; right, 10 feet both asphalt
Median: Depressed; grass, 56 feet wide
Features: At grade; tangent
Date and Time: April 18, 1988; 2:15 a.m.
Ambient Conditions: Darkness; cloudy and dry
Heavy Truck Involved: 1986 Kenworth tractor in combination with a trailer transporting a ladle of molten aluminum
Motor Carrier: Universal Trucking of Spartanburg, Inc.
Type of Operation: Common Carrier
Size of Operation: 7 power units
Total Weight of Truck: 75,420 pounds
Total Length of Truck: 55 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit traveled south on Interstate 85. A 17,000-pound ladle was secured by chains on the single drop frame trailer. The ladle contained about 31,000 pounds of molten aluminum. The vehicle veered from the tangent roadway onto the right shoulder, and the front of the tractor struck the north end of a metal guardrail bordering the outer shoulder. It overrode the guardrail for 155 feet then moved rightward from the guardrail onto the embankment and overturned. The vehicle came to rest in the roadside ditch about 300 feet from where it first struck the guardrail. It had rotated about 180° and was on its top facing a northerly direction. During the accident sequence, the ladle was separated from the trailer and the molten aluminum spilled over a wide area. The vehicle and surrounding area was immediately engulfed in flames. The carrier estimated the temperature of the aluminum at the time of the accident was 1300°.

Both the tractor and the trailer were destroyed by the intense fire. The truckdriver was entrapped in the tractor and died in the fire. It could not be determined whether he had been belted.

The truckdriver had over 15 years experience in heavy trucks, over 10 years with his current employer. The current employer had provided some inservice training. The truckdriver had a valid South Carolina Class 3 driver license with a restriction of corrective lenses. He had no recorded traffic conviction or accident in the last five years. There was no evidence of fatigue of the truckdriver, and he was in compliance with hours of service regulations.

A State Medical Examiner determined the cause of death of the truckdriver was "Thermal trauma secondary to incapacitation due to heart disease." In his

diagnosis, the Medical Examiner stated that the appearance of the coronary arteries strongly suggested that the truckdriver had a heart attack that caused his vehicle to go out of control.

The motor carrier maintained a driver qualification file for the truckdriver in accordance with Federal Motor Carrier Safety Regulations (FMCSR). In the current and previous DOT physicals (1987 and 1985), the medical history provided by the truckdriver showed no cardiovascular disease. Both physicals were by a physician selected by the motor carrier. According to the truckdriver's wife, he had been taking blood pressure medication prescribed by a family physician for about 10 years. He was currently taking both Tenormin and Maxzide.

There were no toxicological samples from this truckdriver sent to the Center for Human Toxicology. The Medical Examiner could not obtain an appropriate sample for submission to the Center for Human Toxicology.

Blood samples from the truckdriver were tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 69

Investigation No.: LAX-88-H-TR11
Accident Location: Southbound SR-111 at 66th Avenue, Mecca, California
Lanes: 2 lanes, undivided
Shoulders: Right, 7 feet, asphalt
Median: None
Features: At Grade, straight, level
Date and Time: April 20, 1988, 3 p.m.
Ambient Conditions: Cloudy, daylight, dry, 88°F
Heavy Truck Involved: 1978 White COE 2-axle tractor in combination with two 20-foot trailers
Motor Carrier: Robert Cummings Trucking
Type of Operation: Common Carrier
Size of Operation: 15 power units
Total Weight of Truck: 77,500 pounds
Total Length of Truck: 61 feet
Other Vehicle Involved: 1973 Ford LTD stationwagon and 1981 Ford pickup
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The case vehicle was traveling southbound on SR-111 at a witness estimated speed of 55 mph. The driver had just loaded 55,450 pounds of cotton seed in Thermal, California at 54th Avenue and was enroute to Yuma, Arizona. As it approached the intersection of 66th Avenue, the vehicle veered approximately three feet to the left and struck a Ford stationwagon that was stopped in the left turn pocket southbound SR-111 at 66th Avenue. The vehicle veered across the traffic lane into the northbound lane and sideswiped a Ford pickup truck. The tractor and trailers overturned as the tractor struck the double beam guardrail adjacent to the northbound lane. The driver was ejected from the deformed tractor cab and fatally injured. The tractor came to rest, overturned, in the center of the roadway.

The tractor sustained major damage to the cab with the majority of the deformation focused on the right side due to vehicle rollover. Both trailers received minor to moderate damage to the exterior skin; the cotton seed was spilled from the trailers which were open at the top. When the brake adjustments were checked by the California Highway Patrol, they found the pushrod stroke for the right rear brake on the pull trailer to be at two and one half inches, when a two inch maximum is recommended. Further examination of the tractor revealed that the driver's seat was without a lap belt restraint. The driver was found on the embankment east of the east shoulder and had sustained massive head injuries. There were no other injuries involved in this collision.

The 38-year-old driver held a valid California class one operators license for the type vehicle being driven and also a valid medical certificate. The California Department of Motor Vehicles record for Mr. Alvarez listed one drunk driving conviction on 10-9-86 with a three year court probation, and one accident on 8-25-87. A National Driver Record check, and 50-state license check were both negative.

Mecca, California
Case No. 69

An investigation into the 72 hour history of the driver, based upon the subhaulers statements, records, and weigh slips, found that the driver was off on April 16 and 17 and worked on the 18, 19, and 20. On the 18th and 19th, the driver made one load per day and traveled from Blythe, California, to Coachella, California, where he loaded and then traveled to San Luis, Arizona, and returned home. On the collision date he attempted to make the same trip twice. He left home at about 1:30 a.m. on the 20th and traveled to Coachella, California a distance of 89 miles, and loaded at 7:52 a.m. He traveled to San Luis, Arizona, a distance of 171 miles, where he dropped the full trailers and picked up two empty trailers. He returned to Coachella, California, a distance of 171 miles, and loaded again at 2:25 p.m. and was enroute back to San Luis, Arizona. He crashed at 3 p.m. in Thermal, California, approximately 15 miles south of where he loaded. At the time of the collision the driver had been on duty for approximately 13 hours and had been driving for approximately 9 of those hours. The truckdriver had been operating trucks for approximately one year for the subhauler. The subhauler was under contract to the carrier for approximately one year. The carrier began operating in 1968, and the subhauler began operating in 1983.

Neither motor carrier nor the subhauler maintained a driver qualification file. Driver logs were not available for review. Maintenances records were made available, but were not maintained in a systematic manner by the subhauler. The carrier and the subhauler had not been audited by any agency, Federal or State.

The tractor went through a California Commercial Vehicle Safety Alliance (CVSA) inspection on 3-31-88 and failed. The discrepancies were later corrected by the subhauler and a compliance sticker was issued.

Toxicological samples from this truckdriver were not sent to the Center for Human Toxicology.

Blood samples from the truckdriver were tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO: 70

Investigation No.: SEA-88-H-TR11
Accident Location: State Route 152, 4 miles north of Dos Palos, California
Lanes: 4 lanes, divided
Shoulders: Right, 1.6 feet; left, 1.5 feet, both asphalt
Median: 135 feet of dirt and grass
Features: At grade, straight, 1 percent upgrade
Date and Time: April 23, 1988; 3:30 a.m.
Ambient Conditions: Cloudy, dark, and raining
Heavy Truck Involved: 1978 White Freightliner COE tractor
Motor Carrier: Come Along Transportation
Type of Operation: Common Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 15,190 pounds
Total Length of Truck: 24 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The 1978 White Freightliner tractor was traveling westbound on State Route 152. About 0.25 mile west of San Juan Road, the lone tractor began sliding on the rain-soaked roadway. The tractor went off the left side of the road and overturned, leaving a mark on the asphalt at an angle of 20 degrees from the fogline. When the tractor came to rest it had traveled about 140 feet in the soft dirt and grass median.

The rollover caused crushing to the top of the cab, deforming the metal downward, to the rear, and to the right. The entire top to the passenger compartment and sleeper was forced down to near the level of the instrument panel. The unrestrained fatally injured driver was found pinned in the cab. His injuries were bruises, abrasions, and multiple rib fractures. The official cause of death was listed as "asphyxia secondary to compression of the chest."

A second accident took place 3 hours and 40 minutes later, also in the westbound lanes and involving a lone tractor. This tractor rolled and came to rest on its wheels in the median about 125 feet past the case vehicles. The driver stated that after he had shifted down, he lost control and it felt like he was being pulled toward the median.

According to the State of California (CALTRANS), the skid number (ASTM E 274-70) of the westbound outside lane 106 feet west of the accident site was 23. The eastbound outside lane in the same area produced skid numbers ranging from 33 to 41. These eastbound lanes appeared visually similar to the westbound median lane. The westbound outside lane had a fairly new overlay of asphalt on it. According to State of Kentucky criteria, any surface with a skid number below 26 is considered "very slippery."

Dos Palos, California
Case No. 70

Through it does not appear that the driver was in violation of his hours of service, he had been awake and active for 20 hours before the accident. No log books were found.

This was the driver's first trip for the carrier. When he applied for the job, he presented a forged medical card, a driver's license with his picture bearing his brother's name, a social security card in his brother's name, and a California Department of Motor Vehicles driving record printout for the invalid license. Further investigation revealed his own license had been suspended in 1984 and that he also held a valid New Mexico driver's license.

According to his wife's statement, the driver had 25 to 30 years experience operating heavy trucks and had no formal training. An examination of his driving record for all three licenses showed four citations in the last five years with no accidents. Two of the violations were for exceeding the speed limit.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 700 ng/ml of codeine,, 180 ng/ml of chlorpheniramine, and 5,000 ng/ml of caffeine. No other drugs, as identified by the National Transportation Safety Board (NTSB) testing protocal, were identified.

Blood Samples from the truckdriver were also tested at he request of the State of California. This analysis indicated that the blood sample contained 900 ng/ml of phenobarbital. According to his doctor, the driver was probably taking the codeine for his chronic back pain, and the chlorpheniramine for his allergies. He said that he had also ordered some Albuterol for the driver in April.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the low friction characteristics of the wet roadway. Contributing to the accident was the impairment of the driver due to fatigue and his use of drugs; codeine, phenobarbital, and chlorpheniramine. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 71

Investigation No.: LAX-88-H-TR12
Accident Location: State Route 91 near Lakewood Blvd, Bellflower, California
Lanes: 8 lanes, divided
Shoulders: Left, 15 feet; Right, 10 feet, both asphalt, adjacent to 16-foot asphalt on ramp bordered by 38-foot, -8 percent dirt slope.
Median: 30-foot commuter lane/median divided by concrete barrier
Features: Essentially level, straight, above grade
Date and Time: April 23, 1988, 10:50 a.m.
Ambient Conditions: Daylight, heavy rain, wet road
Heavy Truck Involved: 1976 Freightliner 3-axle COE tractor in combination with an empty 40-foot tank trailer
Motor Carrier: California Milk Producers, Inc.
Type of Operation: Private Carrier
Size of Operation: 63 power units
Total Weight of Truck: 26,520 pounds
Total Length of Truck: 50 feet
Other Vehicle Involved: None

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The Freightliner was eastbound on State Route 91, approaching the convergence of the Lakewood Blvd. onramp for the eastbound freeway, at a witness reported speed of approximately 35 mph. Witnesses reported the truck to be traveling in the E-3 lane and slowing for traffic ahead. Rain was heavy and visibility was poor. Apparently, a non-contact vehicle abruptly changed lanes from E-4 to E-3 immediately ahead of the case vehicle. Witness statements and evidence indicated that the driver abruptly turned to the right and attempted to slow his vehicle in order to avoid impact with the vehicle ahead. The truck impacted a right road edge berm, penetrated the end of the berm which constituted a physical gore point separating the E-4 lane from the Lakewood Blvd. onramp, and crossed the onramp lane. The truck left the right road edge and traveled down a 35 foot long, -8 percent embankment, rolling about its longitudinal axis in a clockwise direction through approximately 150 degrees, and impacted and came to rest at a concrete drainage channel.

The vehicle sustained moderate damage to the right front and side of the cab. The trailer sustained only slight right side deformation. The unrestrained driver was partially ejected through the right windshield area and crushed between the cab and the roadway. He sustained fatal chest injuries. The company stated that it was policy for its drivers to use the available restraints, but admitted it was not very enforceable.

The driver was properly licensed for this vehicle and possessed a valid medical card. He had been driving trucks for more than 15 years, and had been employed by this carrier for approximately 11 years. He had not received any formal training but had an exemplary driving record with his past and current

employers. The driver's record indicates one prior speed violation in the driver's private vehicle and no previous accidents.

A postcrash examination of the vehicle indicated that there were no deficiencies in the performance of the vehicle. An analysis conducted of the onboard mechanical tachograph chart indicated that the vehicle had been traveling at approximately 50 mph when it decelerated to 40 mph. It then rapidly accelerated to 50 mph, consistent with witness statements that the truckdriver attempted to steer around the vehicle. The next recorded movement was rapid deceleration to 44 mph followed immediately by impact with the berm. The chart then indicated an erratic movement of the vehicle leading to a frontal impact at a chart recorded speed of approximately 19 mph.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determined that the probable cause of this accident was the unsafe lane change made by the non-contact vehicle. Contributing to this collision was the wet roadway. Contributing to the severity of the collision was the failure of the truckdriver to utilize his available restraint system and the inadequate cab structure of the power unit.

CASE NO.: 72

Investigation No.: LAX-88-H-TR13
Accident Location: State Route 48 near Lancaster, California
Lanes: 2 lanes, undivided
Shoulders: Left, 10 feet, packed dirt; right, 1 foot asphalt, then dirt sloping down 15°
Median: None
Features: Generally level, straight, at grade.
Date and Time: January 25, 1988, 8:55 a.m.
Ambient Conditions: Daylight, clear, dry
Heavy Truck Involved: 1984 Freightliner 3-axle conventional in combination with a fully loaded 42-foot bottom dump trailer
Motor Carrier: Apex Bulk Commodities, Inc.
Type of Operation: Common Carrier
Size of Operation: 42 power units
Total Weight of Truck: 78,200 pounds
Total Length of Truck: 57 feet
Other Vehicle Involved: None

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The Freightliner was westbound on State Route 48, approaching the intersection with Three Points Road, at a witness reported speed of 65 mph. As the roadway jogged approximately three feet to the left to cross a terrain level change for a drainage channel, the driver apparently failed to follow the traffic lane, and allowed his right trailer wheels to exit the 1 foot wide right road shoulder and enter a 15° downslope of deep silt. Although the vehicle exhibited approximately 170 feet of skidmarks, and the 250 feet of tracks in the dirt showed side movement, the driver was apparently unable to return his vehicle to the traffic lane.

Approximately 180 feet from the beginning of the track marks in the dirt, evidence on the road and in the dirt indicate that the truck started to lift off of the left wheels and initiate a rollover onto its right side. Forty-five feet beyond the point of the cessation of the left wheel skidmarks, the vehicle struck the east side of an elevated private drive which ran perpendicular to the roadway. This impact aggravated the rollover movement and the vehicle impacted the road, coming to rest 70 feet beyond the bank impact.

The vehicle sustained moderate damage to the right front and side of the cab. The unrestrained driver was partially ejected through the right windshield area and crushed between the cab and the roadway. He sustained fatal head injuries.

The driver was properly licensed for this vehicle and possessed a valid medical card. He had been driving trucks for 25 years and had been employed by this carrier for approximately 7 years. He had not received formal training, but had been trained in specific operating requirements of the

various types of company-owned trucks. For four of the seven years at this company, he had been awarded safe-driving awards. His driving record indicated one violation for truck speed and one previous accident for which he was deemed not-at-fault.

The road in the area of the collision bisects a flat plain, with few turns and/or curves. Immediately prior to the accident area, a 3 foot jog to the left occurs to accommodate a drainage channel under the roadway. The path of the truck indicated that the driver did not make this change and once off the right road edge with the right wheels, the road edge drop and the soft dirt would have captured the vehicle and rendered a return to the roadway difficult. Approximately 4 months postcrash the State Highway Department built a 10 foot dirt shoulder along the north road edge. They utilized the same dirt, however, and shoe depressions averaged 10 inches.

Witnesses reported that the driver was exceeding the 55 mph posted speed limit and his wife and employer indicated that he had been under a great deal of stress. This could have contributed to the inattention and initial departure from the roadway; however, State records indicate a high accident experience at this site.

The California Highway Patrol inspected the vehicle and found no evidence of defects or deficiencies. The driver had complained to the company mechanics that the vehicle steered to the right. However, after numerous inspections and adjustments, no other driver or mechanic could detect the reported deficiency. There was no postcrash evidence to substantiate the complaint.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 4,100 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested, for alcohol only, at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the inadequate shoulder structure of the roadway. Contributing to the accident was the driver's inattentiveness. Contributing to the severity of the accident was the driver's failure to use the available restraint and the inadequate cab structure of the power unit.

CASE NO.: 73

Investigation No.: MKC-88-H-TR11
Accident Location: Road 200, 12 miles southwest of North Fork, California
Lanes: 2 lanes, undivided
Shoulders: Raised asphalt curb
Median: None
Features: Winding 7 percent downgrade
Date and Time: February 23, 1988, 4:35 p.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1980 Peterbilt COE in combination with 2 flatbed trailers
Motor Carrier: Lourenco Farms
Type of Operation: Private
Size of Operation: Unknown
Total Weight of Truck: Unknown
Total Length of Truck: Unknown
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was southbound on Road 200. The vehicle was negotiating a right curve with a radius of 550 feet on an 8-percent downgrade when the driver lost control and traveled off the left edge of the travelway. The truck impacted the back slope of the left side of the travelway and rolled over coming to rest on it's top.

As the truck impacted the back slope and rolled onto it's top. The cab was crushed rearward and downward onto the unrestrained driver. The accident resulted in fatal injuries to the driver. The truck sustained substantial damage--the load of dimension lumber came loose and was scattered over the roadway.

The driver had been in the dairy farming business for several years. However, the family would not provide any additional information on the driver. A check of his driving record indicated one minor speeding violation, two unsafe vehicle violations, and one accident in the past three years. The 50-state drivers check gave no indication of multiple licenses or record.

A postaccident inspection of the vehicles was performed by the California Highway Patrol MAIT (multidisplinary accident investigation team). The primary discrepancy noted was that the brake pushrod travel on both sides of axle two exceeded the manufacturers maximum travel before readjustment. Both sides of this axle had a measured pushrod travel of 2 1/4 inches--the factory recommends readjustment on this type and size brake chamber at 2-inches. Also, the brake drums on both sides of this axle showed excessive wear. The drum on the left side of axle two suddenly cracked when air was applied to check it's operation.

North Fork, California
Case No. 73

The accident carrier was a private carrier; however, the load was arranged for through a telephone agreement from Guyzes Trucking of Tulare, California. Consequentially, there was no written lease agreement between the two carriers.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained ibuprofen (analgesic). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement in selecting the wrong gear for a safe descent of the mountainous downgrade. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 74

Investigation No.: ATL-88-H-TR10
Accident Location: I-95, 3.5 miles south from Weldon, North Carolina
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left, 4 feet, both asphalt
Median: 160 feet, trees, wooded area
Features: Level, left curve
Date and Time: April 26, 1988, 1 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1978 International COE tractor in combination with a loaded 43-foot refrigerated trailer
Type of Operation: Common Carrier
Size of Operation: 66 power units
Total Weight of Truck: 72,534 pounds
Total Length of Truck: 54 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was northbound traversing a 30-minute left curve on a 1 percent ascending grade when it ran off the right traffic lane onto the paved shoulder. It continued forward on the shoulder for a distance of approximately 127 feet. Then, the unit veered left approximately 23° and crossed the northbound traffic lanes and a grassed median section, a distance of about 276 feet, to a treed area lining the center median. It traveled about 90 feet into the wooded area, uprooting small trees, before coming to rest against a pine tree. The unit remained coupled and upright. There was no evidence to indicate that the truck's brakes were applied during the accident sequence. Tire marks on the pavement were identified as yaw markings from the unit's right side tires as the vehicle traveled on the shoulder and crossed over the traffic lanes. Tire impressions on the grassed median marked the rolling truck's path to the woodsline. A trailing motorist estimated that the truck was traveling about 65 mph and said that he saw no brake lights actuate as the unit ran onto the shoulder or when it veered left and crossed the roadway. Postcrash inspection findings revealed that the truck brakes had been in recent operation and should have operated if they had been applied.

During the crash sequence, the tractor steering axle, saddle fuel tanks and components below the frame ahead of the rear axles were stripped away. The front . . the tractor cab received moderate crush damage from contact with the tree. The impact left its left door jammed. The right side of the trailer sustained severe crush damage. The unrestrained truckdriver remained at his seat; he was unconscious and slumped over the steering wheel when the unit stopped. He died at a local hospital about one and one half hours later. An autopsy revealed that the truckdriver was not killed by accident trauma, rather he died from undetermined natural causes; probably cardiac arrhythmia.

The 27-year-old truckdriver successfully completed a commercial truckdriver training course in July 1983. He had driven heavy trucks for about three years and had been employed by this motor carrier about six weeks. He

held a valid unrestricted Florida chauffeur drivers license. His previous three year driving record revealed two traffic violation convictions and two accidents. The motor carrier had qualified the driver and maintained a Driver Qualification File as required by Part 391 of the Federal Motor Carrier Safety Regulations (FMCSR). The truckdriver was in compliance with the FMCSR Hours of Service Regulations. He had proper rest the night before the accident and had been driving 3 1/2 hours when the unit left the road.

The truckdriver had a history of convulsive seizures. The physical requirements of FMCSR Part 391.41(b)(8) prohibit examining doctors from qualifying persons who have an established medical history or clinical diagnosis of epilepsy or any other condition which is likely to cause loss of consciousness or any loss of ability to control a motor vehicle. This interstate driver had been qualified by three physicians and two known motor carriers, including the current carrier, since the seizure problem began. Neither the motor carriers nor the examining physicians were aware of the driver's seizure history. He had concealed the information by giving false answers to questions on the carrier's employment applications and the physician's medical examination forms. Additionally, he failed to enter on the current carrier's employment application a previous motor carrier that he drove for in 1986; that carrier had disqualified him after he was involved in a serious accident. The driver had suffered seizures, and lost consciousness, in December 1983 and December 1984. Following the first seizure he was hospitalized at a VA hospital for two days, began taking Dilantin daily to control the problem, and was warned by the attending physician against driving vehicles or operating heavy equipment. Subsequently, he remained under the care of the VA doctors as an out patient, and continued taking Dilantin, until December 1986 when he went to a private physician that discontinued the medication.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident the physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 75

Investigation No.: DEN-88-H-TR10
Accident Location: Interstate 15, 20 miles north of San Bernardino, California
Lanes: 8 lanes, divided
Shoulders: 5-foot wide, asphalt
Median: Earthen, 25 feet wide
Features: Straight, level
Date and Time: April 26, 1988, 8:15 p.m.
Ambient Conditions: Clear, dark
Heavy Truck Involved: 1973 Freightliner COE tractor in combination with a 42-foot flatbed trailer
Motor Carrier: Roy Thomas Trucking
Type of Operation: Common Carrier
Size of Operation: 19 power units
Total Weight of Truck: 32,830 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: 1980 Peterbilt tractor in combination with a 40-foot van trailer
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The Freightliner combination unit was traveling north on a straight and level section of Interstate 15. Witnesses stated that the vehicle was traveling between 65 and 70 mph as it crossed all four traffic lanes and entered the exit lane to the truck scale. It then struck the rear of a slow moving Peterbilt tractor/trailer unit in the exit lane for the scales. The impact dislodged the rear tandem axle from the trailer of the Peterbilt combination. The Peterbilt combination departed the impact toward the northwest, coming to rest in the northbound traffic lane of I-15. During the accident sequence, the Freightliner's trailer became disengaged at the fifth wheel. The skid plate remained attached to the trailer kingpin. There was blue and orange paint transfer along the rear portion of the cab consistent with the color of the front of the trailer and the overseas container. The Freightliner tractor's frame lodged underneath and against the rear axles of its trailer. The crushed cab and ejected driver came to rest in the east ditch, 80 feet from the point of impact. Postaccident inspection revealed the sleeper-type cab measured 38 inches from the front to the rear at its longest point.

The driver of the Peterbilt stated that he had the four way flashers on while waiting to move up to the scale but turned them off just before the collision.

The accident resulted in fatal injuries to the unrestrained Freightliner driver, and minor injuries to the driver of the Peterbilt. The Freightliner tractor was destroyed, and the trailer and load received minor damage. There was no damage to the Peterbilt tractor, but its trailer and load received substantial damage.

San Bernardino County
Case No. 75

The investigation revealed that the Freightliner driver had a total of 7 years experience in the operation of heavy trucks. There was no record of the driver receiving any formal training. The driver had been employed by the company for two days at the time of the accident. A three year check of the driver's record revealed one conviction for an improperly secured load. He had a valid class 1 California drivers license.

A check of the driver's file revealed no copy of a medical certificate, written examination, or road test. There was no record of the company ever being checked by the DOT or State PUC.

Postaccident inspection of the Freightliner's trailer revealed no improperly adjusted brakes or mechanical defects. Examination of the tractor revealed no mechanical defects, however, the extent of damage prevented any test other than a visual examination.

Blood samples from the Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 328 ng/ml of methamphetamine, 64 ng/ml of amphetamine, 170 ng/ml of ephedrine, and 16,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Freightliner driver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 250 ng/ml of methamphetamine, 50 ng/ml of amphetamine, and 3,500 ng/ml of dimethylxanthines.

Dimethylxanthines (metabolites of caffeine) reported by the California laboratory were not included in the NTSB testing protocol used by the Center for Human Toxicology. The concentration of the other various drugs are in reasonable agreement except for the ephedrine.

A white powder substance was found rolled up in a one dollar bill inside a leather case in the pants pocket of the Freightliner driver. This substance tested positive for methamphetamine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Freightliner driver due to his use of amphetamine and/or methamphetamine.

CASE NO.: 76

Investigation No.: SEA-88-H-TR12
Accident Location: Main Street, Chualar, California
Lanes: 2 lanes, undivided
Shoulders: Right, 8 feet, grass
Left, 6 feet, dirt/gravel
Median: None
Features: Right curve (130-foot radius), level, at grade
Date and Time: April 27, 1988, 10:10 a.m.
Ambient Conditions: Roadway dry, daylight, no adverse weather
Heavy Truck Involved: 1980 Peterbilt COE flatbed truck in combination with a 24-foot flatbed trailer
Motor Carrier: Bud of California
Type of Carrier: Private Carrier
Size of Operation: 45 power units
Total Weight of Truck: 66,000 pounds
Total Length of Truck: 53 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

This accident occurred as the combination unit was traveling north on Chualar River Road. When entering the City of Chualar, it was rounding a 90° right curve. The truck crossed into the southbound lane and had nearly rounded the curve when it went off the north shoulder of the roadway and the flatbed truck overturned, displacing the entire load of boxed lettuce. The truck came to rest facing east, approximately 4 feet from the north edge of the roadway, and nearly parallel to the road. The trailer remained upright behind the tractor, partially on the roadway, and facing northeast. Only several boxes of lettuce fell off the trailer during this event.

The roadway approaching the accident site, traveling north, was straight for at least 1 mile prior to the sharp curve where Chualar River Road became Main Street. A "20 MPH" speed limit sign with a 90° arrow was in place approximately 1000 feet prior to the curve.

The unrestrained driver remained entrapped within the vehicle. Emergency medical personnel arrived within a few minutes and no vital signs could be found on the driver. The driver sustained three rib fractures, contusions, abrasions, and lacerations. The cause of death was listed by the pathologist to be "Asphyxia Due to Chest Compression."

The 1980 Peterbilt had damage to the left front of the cab. The A-pillar intruded the cab approximately 36 inches at the top and 18 inches at the bottom. The roof was crushed about 6 inches in the driver compartment area. The steel stake racks on the truck bed were also bent. An examination of the truck failed to reveal any mechanical defects. The only damage to the 1985 company built "Bud Antle" trailer was a broken "eye" on the end of the drawbar where it is attached to the "pintle hook" of the truck.

Chualar, California
Case No. 76

The truckdriver had worked for this commercial agriculture company for over 20 years and had been a truckdriver for most of that time. He had 9 years experience in the accident vehicle configuration and was familiar with the roadway. This driver had recently received a 15 year safe driving award pin.

A record check in the State of California revealed no violations or accidents within the past 3 years. A 50 State Check revealed that the driver held only one license and an NDR (National Drivers Registry) check did not reveal any revocations or suspensions.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed of his high center-of-gravity vehicle and load on the roadway curvature. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 77

Investigation No.: FTW-88-H-TR06
Accident Location: Interstate Highway 5 in Dunsmuir, California
Lanes: 4-lanes, divided
Shoulders: Right, 9 feet wide, asphalt
Median: 15 feet, asphalt, sloping downward from shoulder
Features: 3 percent upgrade
Date and Time: May 3, 1988, 6:15 a.m.
Ambient Conditions: Clear, dry, and darkness
Heavy Truck Involved: 1985 International COE 2-axle tractor in combination with a loaded 45-foot trailer
Motor Carrier: Continental Transportation Inc.
Type of Operation: Contract Carrier
Size of Operation: 160 power units
Total Weight of Truck: 32,000 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 2 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The International tractor was pulling a 1978 Matlock van trailer loaded with furniture. The northbound combination unit had traversed a 2,969-foot radius curve and had travelled approximately 700 feet on a straight 3 percent upgrade, when it veered gradually toward the right shoulder and departed the travel surface at a 5^{o} angle. The combination unit travelled down a 33^{o} slope, struck several stumps and small trees, overturned onto its right side, and struck a 17-inch diameter tree. The unit travelled approximately 257 feet from the area where it departed the shoulder to its impact with the large tree. The right side tires left approximately 130 feet of tiremarks on the roadside material before the unit overturned on its right side. These marks were characteristic of free rolling tires. There were no tiremarks on the pavement surface, and a postcrash inspection of the vehicle showed that there were no defects that would have led to a loss of control. At impact, the 17-inch diameter tree penetrated into the driver's cab, through the sleeper cab, and into the trailer.

The accident resulted in extensive damage to the tractor and trailer, and both the unrestrained driver and the unrestrained codriver, who was asleep in the sleeper cab, were ejected and killed.

The accident driver had approximately 1 year of experience operating heavy trucks, and she had completed a 4 week professional truck driving school at the Western Truck Driving School in Oakland, California. The driver had been working for her present employer for approximately 5 months. However, during this time period, she had been off work for 2 months recuperating from an on the job injury. Additionally, the driver received a disciplinary warning letter from her employer that was dated April 13, 1988. The warning letter addressed the driver's alleged inability to meet her driving schedule.

Dunsmuir, California
Case No. 77

Information provided by relatives and the motor carrier indicated that the driver had departed her assigned driving route without authorization and had travelled some distance away to visit relatives in the hospital. Upon receipt of the reprimand letter, the driver requested and was granted one week of leave to decide whether she wished to continue her employment as a driver. She returned to work on April 24, 1988. A search of the driver's state driving record showed that she had not been convicted of any traffic law violations nor been involved in any accidents in the preceding 3 years. The motor carrier's driver qualification files on the accident driver showed that she had not been administered a written test or a road test. The file also showed that the driver had been administered a drug screening test on March 9, 1988, as a condition of employment. The drug screen was negative.

Information provided by the motor carrier and relatives indicated that the driver and codriver were house mates with another lady in Fresno, California. The driver was a single parent and had two children living with her in Fresno. Relatives stated that the driver was exhausted from her demanding driving schedule and her parenting responsibilities. The driver signed off-duty on Friday night April 29, 1988, at about 9:30 p.m.. She was off-duty during the weekend, and in Fresno with her children. On Sunday May 1, 1988, the driver, her children, and her codriver, travelled 3 1/2 hours to San Mateo, California, to visit relatives who were ill. After the visit, the driver took about a one hour nap and departed on the return trip at approximately midnight. The driver and codriver then reported for work at approximately 4:45 a.m.. The driver's sister stated that it was normal for the driver to only have around 5 hours sleep a day. The accident driver's log showed that she was in the sleeper berth from 5 a.m. until 9:30 a.m. Between 9:30 a.m. and midnight on Monday May 2, 1988, the driver drove for 5 hours, logged 2 hours of duty not driving, and 5 hours of off-duty time. On May 3, 1988, the accident driver logged sleeper time from midnight until 1:30 a.m., and drove from 2 a.m. until 3:45 a.m. The logs showed that she then took a 15 minute break, and then drove from 4 a.m. until the accident occurred at 6:15 a.m.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Vitreous samples from the truckdriver were tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue.

CASE NO.: 78

Investigation No.: MKC-88-H-TR12
Accident Location: I-15 MP-174.3, 37 miles east of Baker, California
Lanes: 5 lanes (3 southbound, 2 northbound)
Shoulders: Left, 5 feet; right, 9 feet with asphalt curb
Median: 200-foot wide earthen
Features: Straight, 4 percent upgrade
Date and Time: March 22, 1988, 2:35 p.m.
Ambient Conditions: Clear and dry
Heavy Truck Involved: 1985 International COE tractor in combination with an empty 40-foot trailer
Motor Carrier: Master-Halco, Inc.
Type of Operation: Private Carrier
Size of Operation: 45 power units
Total Weight of Truck: Unknown
Total Length of Truck: 60 feet
Other Vehicle Involved: 1985 Freightliner in combination with a 48-foot Dorsey trailer

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The 1985 International combination vehicle was southbound on Interstate 15, overtaking another combination vehicle in the right lane. The driver failed to turn out to the left in time and struck the trailer of the leading vehicle's trailer in the left rear with the right front corner of the tractor cab. The striking vehicle continued around the other truck, then traveled off the right edge of the travelway and impacted the back slope of the roadside ditch. The combination unit traveled 267 feet from impact with the other truck to where it departed the travelway and impacted the bank.

A postcrash fire ensued which fatally injured the driver and destroyed the tractor. Due to the postcrash fire, it was not possible to determine if the driver was utilizing the restraint system.

This driver's application for employment indicates that he had been driving since 1960. However, the company safety director advised that he knew this driver personally and that he had been driving for 30 years. A check of this driver's motor vehicle record showed no violations for the past three years. Also, a 50-state driver's check was negative for additional or multiple drivers licenses.

The investigating patrol officer found five unopened cans of beer in the cab of the truck.

Blood samples from the International driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.06 percent alcohol. No other drugs, as identified by the NTSB testing protocol, were identified.

Baker, California
Case No. 78

Blood samples from the International driver were also analyzed by the Root Pathology Laboratory of San Bernardino, California. This analysis also indicated a BAC of 0.06 percent.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the International driver due to alcohol. Contributing to the accident was the poor conspicuity of the leading vehicle's trailer.

CASE NO.: 79

Investigation No.: ATL-88-H-TR11
Accident Location: I-240, 0.6 miles west from Asheville, North Carolina
Lanes: 6 lanes, divided, both on separate bridges
Shoulders: Asphalt, 8 feet wide
Median: None
Features: Right curve on descending grade
Date and Time: May 14, 1988, 2:10 a.m.
Ambient Conditions: Clear, dry, darkness
Heavy Truck Involved: 1981 Freightliner COE tractor in combination with a loaded 48-foot van trailer
Motor Carrier: Combs Freight Lines, Inc.
Type of Operation: Common Carrier
Size of Operation: 23 power units
Total Weight of Truck: 75,546 pounds
Total Length of Truck: 61 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was eastbound as it traveled into a 917-foot, 4-degree 30-minute right curve that included a 190-foot bridge. As it approached the bridge, the unit moved across the center lane, began yawing left, crossed over the left lane and the paved median shoulder where the tractor contacted a guardrail section which connected to the bridge. Still rolling left, and its left side in contact with the guardrail, the unit continued forward on the shoulder for a distance of about 65 feet before reaching the west abutment of the bridge. The left front of the leaning tractor struck the top of the concrete abutment and the unit continued forward onto the bridge. Completing a approximate 45° counterclockwise rotation about its longitudinal axis, it lay on it's left side in contact with the bridge rail. The left side of the tractor cab and the van trailer was ripped open as the unit continued forward across the bridge. Contents from the cab and trailer were spilled along the bridge rail and the driver was ejected as the unit reached the east end of the bridge. The unit continued forward off the bridge, moved left onto the shoulder, overturned onto its roof, crashed through a guardrail and skidded down a grassed median slope to rest on it's top. The trailer was still attached to the tractor. From initial contact with the guardrail west of the bridge, to its rest location, the unit traveled approximately 357 feet. A postcrash inspection revealed no precrash defects that would have caused the accident. The lack of witnesses and physical evidence precluded a determination of the truck's speed. There was no evidence to indicate that the driver applied brakes, or made any other evasive maneuvers, prior to initial impact with the guardrail on the west side of the bridge.

The tractor cab and van trailer were destroyed. The unrestrained driver was killed. The Medical Examiner's Report indicated that the truckdriver's death was caused by "Massive Crush of Chest and Abdomen" due to the truck wreck.

Asheville, North Carolina
Case No. 79

The 34-year-old driver had no formal truckdriver training. He had driven heavy trucks for about 8 years and had been employed by the motor carrier for about 14 months. He held a valid Special Chauffeur Tennessee drivers license. His previous three year driving record revealed one reckless driving and two speeding violations plus one accident. The three traffic violations occurred in a one-year period and resulted in a proposed suspension of his license; the driver avoided the suspension by completing a state administered defensive driving course. The recorded accident was similar to the subject accident; it occurred in 1986 when he ran off the road and overturned a tractor semitrailer in the early morning. The motor carrier had qualified the driver as required by Part 391 of the Federal Motor Carrier Safety Regulations (FMCSR). The carrier's Medical Examiner's Certificate for the driver was not valid. It was dated November 10, 1986, and was furnished to the motor carrier by the driver. The motor carrier had accepted the certificate in lieu of having him examined when he was hired in March 1987. This investigation revealed that the doctor who purportedly examined the driver had not practiced medicine since 1982. However, a doctor who examined the driver 17 days before the accident advised that he met the minimum physical requirements of FMCSR Part 391.41 (b) and could have been certified as an interstate driver.

The driver was in compliance with the FMCSR Hours of Service regulations but probably was fatigued. He went on duty about 8 a.m. the previous morning at Bristol, Tennessee, and drove the truck unit empty to Lyman, South Carolina, where the accident shipment was loaded. He arrived at the loading location about 11 a.m. With the exception of about 4 hours that he reportedly rested in the tractor sleeper berth, he stood by counting cartons of the shipment onto his trailer until the loading was completed about 12:30 a.m.; the shipment was loaded to the roof and completely filled the trailer. The driver left immediately on the return trip to Bristol and had driven about 1 3/4 hours when the accident occurred.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue.

CASE NO.: 80

Investigation No.: ATL-88-H-TR12
Accident Location: U.S. 221, 8.5 miles south of Marion, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Right, 20 feet, gravel/earthen
Left, 16 feet, grass
Median: None
Features: Left curve at bottom of downgrade
Date and Time: May 16, 1988, 3:40 p.m.
Ambient Conditions: Cloudy, dry, daylight
Heavy Truck Involved: 1979 Freightliner COE tractor in combination with a loaded 45-foot flatbed trailer
Motor Carrier: Colonial Freight Systems, Inc.
Type of Operation: Common Carrier
Size of Operation: 423 power units
Total Weight of Truck: 73,879 pounds
Total Length of Truck: 56.5 feet
Other Vehicle Involved: None

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The southbound combination unit was traversing rolling terrain, entering a 955-foot 6 degree left curve on a 2.5 percent descending grade, when it ran off the pavement onto the right shoulder. It continued forward on the shoulder for a distance of approximately 148 feet then suddenly veered left. The unit's carbon electrode load shifted right, broke loose from its chain/strap trailer securement, and spilled onto the shoulder. The unit returned to the pavement, crossing the traffic lanes in a southeasterly direction. When astride both traffic lanes, the unit rotated 90° clockwise on its longitudinal axis, to its right side and skidded southerly on the pavement for a undetermined distance. It then rotated an additional 90° to its top side, skidded a short distance on the pavement, and came to rest. From the point where it started to overturn to its rest location, the unit traveled a total distance of 257 feet. The unit remained coupled throughout the accident sequence. At rest, the tractor was on it's roof pointing east in the northbound traffic lane. The trailer was resting on its flooring. It extended westerly from the tractor and across the southbound pavement onto the west shoulder of the highway. A northbound motorist reported that the truck was traveling an estimated speed of between 50 and 55 mph when it entered the accident curve. He stated that it appeared to travel straight ahead onto the shoulder rather than follow the pavement curvature.

The tractor cab was destroyed. Its roof was crushed downward to the top of the dashboard and the sleeper berth mattress. The trailer sustained minor damage. The unrestrained truckdriver was trapped inside the tractor cab with his chin pressed against his chest; he died prior to being removed from the vehicle. An autopsy revealed that the driver's death was caused by "Positional asphyxiation, secondary to motor vehicle accident."

Marion, North Carolina
Case No. 80

The 41-year-old truckdriver had no formal truckdriver training. He had driven heavy trucks for about 6 years and had been employed by the lessor motor carrier for about 15 months. He held a valid unrestricted Class 5 Georgia drivers license. His previous three year driving record revealed one accident and two traffic violation convictions; one of those was a DUI conviction that resulted in a two-month drivers license suspension while driving trucks in his current employment.

The subject motor carrier was operating the combination unit under a trip lease agreement with a second motor carrier (lessor) which owned the equipment and employed the truckdriver. The lessor motor carrier had qualified the driver and maintained a Driver Qualification File as required on regular drivers by Part 391.51 (c) of the Federal Motor Carrier Safety Regulations (FMCSR). The lessee motor carrier maintained a limited qualification file as required on trip leased vehicle drivers by Part 391.63.

The driver had made no log entries of his duty time for the day of the accident. He went on duty shortly after midnight the same morning at Atlanta, Georgia, and drove the loaded truck to a location in western North Carolina. After completing that delivery about 10 a.m., he drove the empty unit to the lessee motor carrier's terminal. The terminal where the accident shipment was loaded was about 13 miles from the accident site. A witness at the loading terminal noted that the driver was fully awake but appeared "very anxious, impatient, and in a hurry." Reconstruction of his duty time revealed that he was in violation of the FMCSR Hours of Service Regulations. He had been on duty about 15 1/4 hours following 8 consecutive hours off duty; a violation of FMCSR Part 395.3 (a) (2).

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2 ng/ml of the psychoactive component of marijuana (THC), 16 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 1,400 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified. (NOTE: The driver's wife advised that he smoked marijuana on a daily basis.)

Blood samples from the truckdriver were also tested for alcohol only at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to marijuana use and fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 81

Investigation No.: CHI-88-H-TR11
Accident Location: State Highway 23, Fond Du Lac County, Wisconsin
Lanes: 2 lanes, undivided
Shoulders: Both sides, 10 feet, gravel; plus a 3-foot wide asphalt apron
Median: None
Features: Straight, level roadway
Date and Time: May 17, 1988, 1:35 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1978 Mack tractor in combination with a 40-foot expandable flatbed trailer
Motor Carrier: Lunda Construction Company
Type of Operation: Private Carrier
Size of Operation: 25 power units, 30 straight trucks
Total Weight of Truck: 73,890 pounds
Total Length of Truck: 55 feet
Other Vehicle Involved: 1985 Chevrolet Caprice stationwagon
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 1 **Other Injuries:** 0

FACTUAL SUMMARY:

The Mack combination vehicle was traveling west at a witness estimated speed of approximately 50-55 mph when an eastbound Chevrolet stationwagon crossed the centerline of the roadway and struck the front and left side of the Mack tractor. The Chevrolet was rotated and driven southwest by the impact, coming to rest off the roadway, covered with diesel fuel. Witnesses reported seeing a fireball when the collision occurred. The Mack combination vehicle exited the north side of the roadway and travelled across the shoulder and roadside, through the yard of a residence, and struck and penetrated a house. The floor of the house living room and kitchen collapsed, and the tractor fell into the basement. A fire started which destroyed the Mack tractor, the house and attached garage, and two vehicles in the garage. The trailer and its cargo were damaged by the fire.

The driver of the Mack combination vehicle was fatally injured by the fire. The driver of the Chevrolet was fatally injured during the collision. The two residents of the house were outside when the collision occurred, and were not injured.

A witness traveling east behind the Chevrolet stated he saw the car ahead veer into opposite lane and strike the Mack combination vehicle. A witness traveling behind the Mack combination vehicle for several miles, stated that the speed of the truck was 50 or 55 mph. This witness also stated that she did not see the approaching Chevrolet, but that she saw the rear of the trailer swerve to her left (south) at the time of the impact.

The Mack driver had started work at 0600 hours on May 17, 1988, and had driven 168 miles within Wisconsin, from Hilbert to Greenbay to Tigertown to Hilbert. He arrived in Hilbert, at approximately 1100 hours.

Fond Du Lac, Wisconsin
Case No. 81

After resting and having the trailer loaded, scaled, and reloaded to avoid an overweight axle, he left Hilbert, for Rosemount, Minnesota, at about 1215 to 1230 hours, driving 40 miles to the accident scene.

The driver had approximately 11 years of experience operating heavy trucks, and had been employed by this construction company for 8 years.

According to the Lunda Construction Company, this driver was traveling along this route to preview it for a return trip the following day. On the return trip this driver was to transport a load of light poles which required a Wisconsin Single Trip Permit for an oversized load of 95 feet. A permit application for this move, which included State Route 23 in the routing, was located in the burned tractor.

No mechanical deficiencies were found during an examination of the burned tractor, the partially damaged trailer, or the Chevrolet stationwagon. The Chevrolet had major damage to the left front and side, but also to the right front side, including rubber deposits on the sheet metal of the right front fender and leading edge of the right front door.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 4,100 ng/ml of caffeine and a 10 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested by the Wisconsin State Laboratory. This test found a 5 percent saturation of carbon monoxide in the truckdriver's blood. An alcohol test conducted on blood samples from the Chevrolet driver was negative.

PROBABLE CAUSE:

The National Transportation Safety Board determines the probable cause of this accident to be the failure of the Chevrolet driver, for unknown reasons, to maintain that vehicle in proper lane.

CASE NO.: 82

Investigation No.: DEN-88-H-TR11
Accident Location: Interstate 5, 4 miles south of Tracy, California
Lanes: 4-lanes, divided
Shoulders: Right, 10 feet; Left, 5 feet, both asphalt
Median: 74-foot earthen
Features: Level, at grade
Date and Time: May 20, 1988, 4:42 a.m.
Ambient Conditions: Clear, Dark, 50°F
Heavy Truck Involved: 1982 Peterbilt tractor in combination with a loaded 42-foot flatbed trailer
Motor Carrier: S & H Truck Lines, Inc.
Type of Operation: Common Carrier
Size of Operation: 40 power units
Total Weight of Truck: 35,202 pounds
Total Length of Truck: 65 feet (approximate)
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

A Peterbilt tractor and loaded 42-foot flatbed trailer was traveling north on a level section of Interstate 5. At a point 1540 feet north of the Durham Ferry Road overpass the vehicle went off the east edge of the paved shoulder. It traveled for 400 feet, leaving rolling tire marks along the east ditch, to where it came back onto the roadway. The vehicle then left 107 feet of skid/scuff marks in a northwesterly direction, crossing both northbound traffic lanes. The vehicle then went off the west edge of the roadway, leaving 167 feet of skid marks before rolling on to its top. The vehicle then slid for 47 feet to where it came to rest on its top in the median facing in a northeasterly direction. Speed estimates from physical evidence at the accident site indicated the vehicle speed at 62 to 65 mph. There were no witnesses to the accident.

The driver of the Peterbilt was trapped in the cab due to crush damage to the roof and received fatal injuries. The tractor received substantial damage while the trailer received moderate damage.

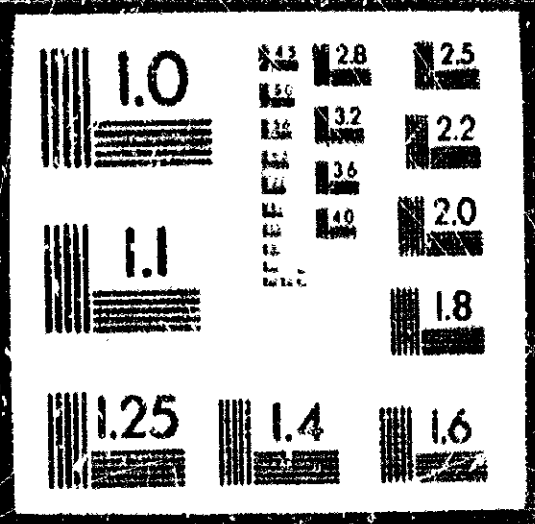
The driver had acquired 12 years of heavy truck driving experience and attended a truck driving school. A search of the driving history revealed the driver had one speeding violation in the three year period before the accident. Examination of the driver's logs for May 19 and 20 revealed that he was in violation of the 10 hour driving rule when the accident was reported. Investigation showed the driver had been out of town on May 17 and 18, returning home at 0600 hours on the 19th. He slept for 8 hours and then left to have some work done on the truck. He went on duty at 1700 and started driving at 1800 hours. No log sheets could be located for May 13 to 18.

A postaccident inspection of the vehicle revealed no mechanical deficiencies. The carrier had been in operation for 27 years and had a safety audit in April 1988, receiving a satisfactory rating.

3 OF 5

PB 90

917 003



Tracy, California
Case No. 82

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT found that the blood sample contained 3 ng/ml of the psychoactive component of marijuana (THC), and 10 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

The California laboratory screened the blood sample only for ethanol (alcohol) and barbiturates--the blood was not screened for marijuana.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the driver due to marijuana use. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 83

Investigation No.: MKC-88-H-TR13
Accident Location: I-81, 1 mile North of Baileyton, Tennessee
Lanes: 4 lanes divided
Shoulders: Left, 4.25 feet, Right, 10.4 feet; both asphalt
Median: 36 feet, grass
Features: 1 percent downgrade
Date and Time: May 23, 1988, 5:40 a.m.
Ambient Conditions: Clear, dry
Heavy Truck Involved: 1984 GMC conventional truck
Motor Carrier: Knoxville Tank & Welding Company
Type of Operation: Private Carrier
Size of Operation: 1 straight truck
Total Weight of Truck: Unknown
Total Length of Truck: 29 feet
Other Vehicle Involved: 1988 Peterbilt conventional tractor
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The GMC boom/straight truck and a Peterbilt tractor with twin trailers were travelling northbound on a relatively straight and level section of I-81 in the outside traffic lane. The GMC was loaded with five sheets of steel (20.5 x 7.5 x 3/8) on the 16-foot truck bed and a two-wheel air compressor was stored on top of the steel. The cable from the boom was pulled down over the end of the steel and fastened to a ring in the rear and below the bed of the truck. The driver of the Peterbilt did not see the GMC until the two vehicles collided. After the collision the GMC veered out of the traffic lane onto the east shoulder for 264 feet. Then the vehicle went back west across the two traffic lanes for approximately 95 feet where it rolled over in the median and the driver was thrown out of the vehicle. As the GMC rolled back over onto its wheels the vehicle broke apart behind the cab of the truck where the boom was attached to the frame. After the collision the Peterbilt went to the inside lane of traffic and applied his brakes and skidded for approximately 226 feet then the driver released his brakes and drove over to the outside of the roadway and parked on the east shoulder.

The collision resulted in substantial damage to the GMC and the unrestrained driver was fatally injured. The Peterbilt received minor damage and the restrained driver received only minor injures.

The driver of the GMC had a valid Tennessee driver's license with no violations or accidents listed. He was not hired to drive, but was hired as a welder. The driver was on the way from home to the job and was using a company truck for transportation to and from work and to get company supplies to the site. The driver had been with the welding company for the past three years. He had no formal truckdriving training. The company had no personal files on their employees, or maintenance program for their truck.

The Office of Motor Carriers was not required to conduct a Safety Compliance Audit of this company.

Baileyton, Tennessee
Case No. 83

The GMC truck was manufactured with a Gross Vehicle Weight Rating of 28,000 pounds. After the truck was manufactured, JLG Industries, Inc. installed a Truck Mounted Crane Model 800BT behind the cab of the truck. To mount the crane they had to drill several holes in the frame. The crane had a total weight of 11,435 pounds. The steel sheets had an approximate weight of 11,680 pounds and the air compressor had an approximate weight of 4,000 pounds for a total weight of 27,115 pounds. The frame broke where there were eight holes in the frame.

Blood samples from the GMC driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the GMC driver were also tested at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the poor conspicuity of the GMC truck due to improper loading.

CASE NO.: 84

Investigation No.: DEN-88-H-TR12
Accident Location: California State Route 99, Galt, California
Lanes: 4 lanes, divided
Shoulders: Right, 8 feet, asphalt; Left, no shoulder
Median: 15 feet wide earth
Features: Straight and level
Date and Time: May 23, 1988, 1:30 p.m.
Ambient Conditions: Clear, calm, temperature 82°F
Heavy Truck Involved: 1981 Peterbilt tractor in combination with a loaded 48-foot van trailer
Motor Carrier: Jack Holt Trucking
Type of Operation: Contract Carrier
Size of Operation: 20 power units
Total Weight of Truck 65,366 pounds
Total Length of Truck: 67 feet
Other Vehicle Involved: 1973 Ford empty 3-axle dump truck
Truck Fatalities: 1 **Truck Injuries:** 1
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The 1981 Peterbilt truck unit was northbound with a load of window air conditioners. Other northbound truck drivers reported the unit was traveling at speeds between 70 and 80 mph. After passing a truck/trailer combination and while pulling back into the right lane, the truck drifted off the right side of the roadway, over the right shoulder, down into and across a three foot deep ditch that was between Route 99 and its north/south service road. A six foot high chain link fence between the roads was destroyed. As the truck came out of the ditch, it rolled over onto its left side. The truck then slid onto the service road and struck the back of a northbound empty dump truck. After striking the dump truck, the truck unit continued sliding in a northeast direction, across the service road, and struck and severed a utility pole and six inch diameter walnut tree at ground level. The truck unit came to rest about 100 feet away from the service road with the trailer on its left side and the tractor on its top. The trailer's king pin and its floor mountings were ripped from the trailer and remained attached to the tractor's fifth wheel. The dump truck rolled 360° and came to rest on its wheels in the southbound lane of the service road. The Peterbilt driver's wife was a passenger on the trip without the carrier's knowledge or permission.

The unrestrained truckdriver was pinned in the tractor wreckage on the driver's side and died at the scene. The coroner listed the official cause of death as craniocerebral trauma. The unrestrained passenger received minor injuries, as did the unrestrained dumptruck driver. The tractor, trailer, and dumptruck were destroyed.

A postcrash inspection of the Peterbilt combination, performed jointly by the investigating police agency and NTSB, revealed no evidence of pre-accident failure or deficiencies.

Galt, California
Case No. 84

The motor carrier was a contract carrier regulated by the Interstate Commerce Commission (ICC), and subject to Federal Motor Carrier Safety Regulations (FMCSR). The Office of Motor Carrier (OMC), Fort Worth, Texas, records show that their office conducted a safety audit on the carrier on September 19, 1974. No rating was assigned. There have been no further inspections by OMC as of the accident date.

An investigation into the fatally injured driver's employment history revealed that he had nine years truckdriving experience. He had no formal truckdriving schooling and learned to drive truck from his father. He was hired by his present employer on July 7, 1987. Prior to this, he was a truckdriver for several different carriers.

At the time of the accident, the Peterbilt driver had two valid driver's licenses--Texas and New Mexico. The Class "A" Texas license expired on February 2, 1989. The Class "B" New Mexico license expired on March 2, 1990. The New Mexico license was clear and had no violations or accidents listed since its issuance on September 17, 1986. The Texas license listed eight speeding convictions, one failure to appear conviction, one accident, and one 6-month suspension for being a habitual violator of traffic laws, during the past three years. Additionally, the record listed a suspension on February 28, 1984, for failure to have motor vehicle liability insurance. The National Driver's Register (NDR) had no listing on the driver. The investigation also documented one "Driving while license suspended" that was not listed on the Texas license record. In addition, three speeding convictions and one log book violation which occurred during the first three months of 1988, were not listed on the New Mexico license report. The driver also had a record for two arrests and convictions for possession of marijuana, in Texas.

The driver's log book entries were up to date; however, the date and times did not coincide with the trip receipts, witness statements, and the account provided by the driver's wife. According to the driver's wife in the 29 hours preceding the accident, the driver had driven about 22 hours, had only two short rest/sleep periods amounting to about 5.5 hours, and had fueling and eating periods amounting to 1.5 hours. The last rest/sleep period occurred six hours before the accident. The driver's wife also said that she and the driver smoked marijuana several times during the accident trip. The last time was about six hours before the accident occurred. Trip receipts and witness statements corroborate the above trip times.

Two plastic bags, one containing white rock crystals testing positive as cocaine, and the other containing white powder testing positive as amphetamine, were found in the passenger's purse. A metal container, with a handful of leafy substance identified and tested as marijuana was found in the truck cab wreckage.

Blood and urine samples from the Peterbilt driver were sent to the Center for Human Toxicology at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined

that the blood sample contained 4 ng/ml of the psychoactive component of marijuana (THC) and 17 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Peterbilt driver due to fatigue and his use of marijuana. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 85

Investigation No.: ATL-88-H-TR13
Accident Location: Interstate 75, 1.5 miles north of Morrow, Georgia
Lanes: 4 lanes, divided
Shoulders: Right, 12 feet; Left 4 feet, both asphalt
Median: Grass; depressed, 57 feet wide
Features: Tangent and level
Date and Time: May 25, 1988, 3:40 a.m.
Ambient Conditions: Darkness; clear and dry
Heavy Truck Involved: 1979 Freightliner tractor in combination with a refrigerator trailer
Motor Carrier: Kanban-Belford Division of Circle Express
Type of Operation: Common Carrier
Size of Operation: 100 power units
Total Weight of Truck: 45,334 pounds
Total Length of Truck: 57 feet
Other Vehicle Involved: 1984 Honda automobile
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The combination unit was northbound on Interstate 75 approaching the Honda automobile and the US 19/41 interchange. Traveling in the right traffic lane, the driver of the Honda reportedly observed the combination unit rapidly bearing down from her rear and steered evasively onto the right shoulder. The front right of the tractor impacted the rear left of the Honda. At impact, the right front tire of the tractor was on the right shoulder about one foot from the edge of the roadway. The faster moving combination unit sideswiped the left side of the Honda, after which its front moved rightward across the shoulder and impacted a metal guardrail and portable concrete barrier just before crashing head on into a vertical three-foot square concrete support at the US 19/41 overpass. The distance from where the combination unit first impacted the Honda on the right shoulder to the concrete support was about 140 feet.

The combination unit was substantially destroyed. The cab of the tractor was demolished; a 3-foot wide imprint at the front of the cab was 14 inches left of center. The engine and transmission had broken away in the crash and were located several feet from the tractor. The vehicle was in several separate section when examined after its removal from the crash site. The left frame rail of the tractor remained with the chassis, and the right frame rail broke away and remained attached to the forward portion of the trailer. The forward portion of the trailer was destroyed. The unrestrained truckdriver remained in the tractor and was killed. The Honda sustained extensive damage at its left rear and left side, and the right side had minor damage from postcrash impact with the metal guardrail. The Honda driver sustained minor injuries.

The 57-year-old truckdriver had over 30 years experience in heavy trucks. He had been operating under a long-term lease to the current motor carrier for

about four months. The only truckdriver training identified was some orientation-type training with the current motor carrier. The truckdriver held a valid Florida chauffeur license. His driver history showed a conviction for failure to obey a traffic instruction sign/device; no other conviction during the last three years for a hazardous violation was documented. Driver records of Virginia show that on December 13, 1979, the truckdriver was suspended for an unpaid fine for overweight; and the suspension has since remained in effect. The suspension was documented in the National Driver Register.

The truckdriver had prepared daily logs through May 23, 1988, or until two days before the accident. Those logs revealed no violations of hours of service regulations. On the 24th, the truckdriver departed Fort Lauderdale, Florida, at 2 a.m. and arrived in Tampa, Florida, at 8 a.m., a total distance of 250 miles. After being loaded, he departed Tampa at 12:30 p.m. During the next 15 hours, he drove about 450 miles to the accident location.

The motor carrier maintained a driver qualification file for the truckdriver in accordance with Federal Motor Carrier Safety Regulations (FMCSR). Reports in the file indicate that the truckdriver was qualified under the regulations. However, the driver license suspension shown above constitutes a disqualification as set forth in 391.15 of the regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,700 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests were not conducted by the State of Georgia.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to fatigue.

CASE NO.: 16

Investigation No.: SEA-88-H-TR13
Accident Location: State Route 68, 10 miles south of Crossville, Tennessee
Lanes: 2 lanes, undivided
Shoulders: Right, 2-3 feet; Left, 3 feet; both asphalt
Median: None
Features: Right curve, 5.5 percent downgrade
Date and Time: May 26, 1988, 4:40 a.m.
Ambient Conditions: Roadway dry, no adverse weather, at dawn
Heavy Truck Involved: 1982 Mack COE in combination with a loaded 31-foot dump trailer
Motor Carrier: Arnold Lime Service
Type of Operation: Private Carrier
Size of Operation: 22 power units
Total Weight of Truck: 79,520 pounds
Total Length of Truck: 46.5 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

This accident occurred as the combination unit was traveling south on Route 68 and descending a 3 mile grade. During this 3 mile stretch, there were several curves and grades of various steepness, with a maximum of 6 percent downgrade. Just prior to the accident occurrence, the combination unit was traveling on a 1/4 mile straight stretch of roadway with a 5.2 percent downgrade. As the combination was rounding a right curve, it crossed into the northbound lane and overturned. After having struck the guardrail, it went down a steep 20 foot embankment and came to rest on its roof, facing south, with the tractor and trailer still connected.

The curve on which the accident occurred had a 325-foot radius, a 5.5 percent downgrade and a 7 percent superelevation. The speed of the truck, using the tip-over formula, was calculated to be approximately 57 mph (the radius of the trailer tire marks was 500 feet and the center of gravity for the trailer was 82.5 inches). The maximum speed at which this vehicle could negotiate this curve without overturning was calculated to be approximately 46 mph. The speed limit in this vicinity is 50 mph. An S-curve sign was located approximately 2/10 mile north of the accident site. There were no signs on the hill warning trucks to travel in a lower gear or at a lower speed.

According to ambulance personnel, the unrestrained driver was found on the east side of the vehicle between the tractor and the trailer. He was pronounced dead at the scene. The Medical Examiner listed the cause of death as "multiple trauma."

The cab of the tractor was ripped completely off the chassis and broken into numerous pieces. The chassis, engine, and drive train remained intact. The brakes on the first drive axle could not be checked with respect to push rod travel, as they were backed off for towing. Air was supplied to the

steering axle and second drive axle and the push rod travel was found to be within Department of Transportation recommended limits. Company maintenance records showed that the tractor received all new brake shoes on May 10, 1988. No mechanical defects were found on the tractor.

The 31-foot dump trailer was found to be intact. However, the left rear of the bed separated from the chassis and the wood side boards were broken. At some point during the overturn, the dump trailer struck the "W-beam" guardrail. The guardrail punctured the upper left corner of the trailer front, and then penetrated the entire length of the trailer. The push rod travel on the trailer brakes could not be checked because they were backed off for towing. The trailer received new brake shoes on January 27, 1988. No mechanical defects could be found.

There was no record of the driver having attended any formal training, but it was established that he had at least 12 years truck driving experience. A driving record check with the State of Tennessee revealed that during the past 3 years the driver had no traffic violations. During this same period, he had one accident resulting in property damage only.

A 50-state check revealed that the driver had only 1 operator's license. A National Drivers Registry check failed to reveal any revocations or suspensions.

Blood and urine samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified in the blood sample. However, it was noted that the blood sample was not of sufficient quantity to test for BASES, anticonvulsants, and analgesics. CHT determined that the urine was negative for BASES, anticonvulsants, and analgesics.

Toxicological tests conducted by the Tennessee Bureau of Investigation were also negative.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for his vehicle and load on the roadway curvature. Contributing to the accident was the lack of speed advisory signs. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 87

Investigation No.: FTW-88-H-TR07
Accident Location: State Route 111, 3 Miles north of Niland, California.
Lanes: 2 lanes, undivided
Shoulders: 4.5-foot wide asphalt shoulder
Median: None
Features: Level, at grade
Date and Time: May 28, 1988, 11:40 a.m.
Ambient Conditions: Clear and Dry
Heavy Truck Involved: 1972 Peterbilt COE tractor in combination with an empty 42-foot trailer
Motor Carrier: Craig Bishop Refrigerated Transport
Type of Operation: Common Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 29,800 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: 1981 Ford COE tractor in combination with a loaded 42-foot trailer

Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 2

FACTUAL SUMMARY:

The Peterbilt combination vehicle was southbound on State Route 111, and the Ford combination was northbound on State Route 111 at a driver estimate speed of 50 mph. The Peterbilt combination unit veered completely into the northbound lane and struck the Ford combination unit. The Peterbilt had just entered the 5,700-foot radius curve and the Ford combination unit had almost completed negotiating the 2,906-foot curve when the impact occurred. The Ford unit skidded approximately 177 feet prior to impact, and the Peterbilt unit skidded approximately 60 feet prior to impact. At initial impact the right side of the Peterbilt sideswiped the left side of the Ford, and then the Peterbilt tractor struck the loaded trailer of the Ford unit. The Peterbilt unit travelled 145 feet after impact, and the Ford unit travelled 130 feet after impact. The Ford unit came to rest on the right roadside, and the Peterbilt came to rest in the northbound traffic lane facing south. The Peterbilt driver was ejected at impact and came to rest on the west roadside about 65 feet from the impact area.

The Peterbilt combination unit was destroyed, and the unrestrained driver was killed. The Ford combination unit received substantial damage, and the driver and passenger received minor injuries. The Peterbilt truck was not equipped with seatbelts.

The Peterbilt driver had been off duty for the preceding 3 days. A friend of the driver stated that the driver had congested sinuses, and that the driver took a large dosage of some type of sinus medication prior to departing on the accident trip. The Peterbilt driver had 5 years of heavy truckdriving experience and had been an independent operator for 2 years. During the preceding three years, the Peterbilt driver had been convicted of 12 traffic law violations. He had not been involved in any other traffic accidents during this period.

Niland, California
Case No. 87

Blood samples from the Peterbilt driver were sent to the Center for Human Toxicology (CHT) at the University for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 830 ng/ml of methamphetamine, 90 ng/ml of amphetamine, and 350 ng/ml of ephedrine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of California. This analysis indicated that the blood sample contained 452 ng/ml of methamphetamine.

Because of a limited blood sample, the specimens sent to the California laboratory were diluted 4 to 1 and a screen was not performed for ephedrine. Because of the dilution, the sensitivity is reduced and errors will be greater. Consequently, the Center for Human Toxicology results are expected to be more reliable.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Peterbilt driver due to his use of drugs; methamphetamine and/or amphetamine and ephedrine.

CASE NO.: 88

Investigation No.: MKC-88-H-TR14
Accident Location: U.S. Highway 11, 13 miles west of Cleveland, Tennessee
Lanes: Two
Shoulders: Right, none; left, 8 feet asphalt
Median: None
Features: 4 percent downgrade, right curve with 7 percent superelevation
Date and Time: May 31, 1988, 11:40 a.m.
Ambient Conditions: Clear and dry
Heavy Truck Involved: 1984 Peterbilt tractor in combination with a loaded 48-foot trailer
Motor Carrier: Harold W. Kelley Trucking
Type of Operation: Common Carrier
Size of Operation: 7 power units
Total Weight of Truck: 73,600 pounds
Total Length of Truck: 62 feet
Other Vehicle Involved: None

Truck Fatalities:	1	**Truck Injuries:**	0
Other Fatalities:	0	**Other Injuries:**	0

FACTUAL SUMMARY:

The combination vehicle was westbound on U.S. Highway 11 when the driver lost control. The driver was attempting to negotiate a descending right curve which had a centerline radius of 626 feet. The combination left centrifugal scuffmarks on the roadway parallel to the centerline, then, midway through the curve, crossed over the centerline. At a point 4 feet into the eastbound lane, the vehicle overturned onto its left side. It slid on its left side, travelled through a "W-beam" guardrail, and came to rest in a ditch 175 feet from the area where it crossed the centerline. Speed estimates from the scuffmarks indicate that the combination was travelling approximately 74 - 77 mph.

A postaccident inspection of the vehicle revealed no mechanical deficiencies. The cab of the tractor was torn open along the left side. The left headlight was displaced rearward 96 inches. The trailer was torn open at the top front and part of the load of baled cotton exited the trailer through this opening. The unrestrained driver was ejected from the cab at some point during the collision sequence and sustained fatal injuries.

This driver had no formal truckdriving training. However, he had accumulated 3 years of over-the-road experience. The trucking company was owned by the driver's father and, at the time of the accident, the driver was not a full-time truckdriver. His primary responsibility was the management and operation of a family-owned truckstop; he drove only short local trips on an as-needed basis. A 50-State driver's license check revealed no adverse driving record or additional driver's licenses.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and

quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BASES and anticonvulsants.

Toxicological tests were not conducted by the State of Tennessee.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed for his vehicle and load on the roadway curvature. Driver inexperience may have contributed to the accident.

CASE NO.: 89

Investigation No.: NYC-88-H-TR12
Accident Location: Interstate 95, at MP 14.2, Bellcamp, Maryland
Lanes: 6 lanes, divided
Shoulders: Right, 10.7 feet; left, 10.5 feet, both asphalt
Median: 300+ feet (median rest stop)
Features: At grade, straight
Date and Time: May 31, 1988, 2:20 p.m.
Ambient Conditions: Clear, dry, 94° F
Heavy Truck Involved: 1980 Mack conventional tractor in combination with a flathed trailer
Motor Carrier: Mawson & Mawson, Inc.
Type of Operation: Common Carrier
Size of Operation: 159 power units
Total Weight of Truck: 63,100 pounds (approximate)
Total Length of Truck: 59 feet
Other Vehicle Involved: (1) 1980 Mack conventional tractor in combination with a low-boy trailer hauling a bulldozer (parked)
(2) 1984 Chevrolet stationwagon

Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 2

FACTUAL SUMMARY:

The Mack tractor and flatbed trailer, loaded with two tinplate coils, was northbound in the right lane of Interstate 95 in Belcamp, Maryland. At milepost 14.2, the right front tire of the Mack tractor collided with the blade of a bulldozer that was loaded on a low-boy trailer parked on the right shoulder. The Mack tractor then crashed into the low-boy tractor and into a Chevrolet stationwagon that was also parked on the shoulder in front of the low-boy.

During the collision the bulldozer blade severely damaged the right side of the Mack tractor and trailer, and both tinplate coils on the flat bed broke free of their securing chains, moved forward through the trailers buckboard and crushed the tractor cab killing the unrestrained driver. When the crash occurred the Chevrolet and low-boy drivers were both outside of their vehicles standing in the right shoulder. Both drivers stated that several minutes earlier, while traveling northbound, the low-boy trailer had kicked up a stone that cracked the Chevrolet windshield and both drivers stopped on the right shoulder to exchange information. The Chevrolet driver stated that during the collision he was pushed over the guardrail and the low-boy driver was knocked down. Both of the drivers received minor injuries while none of the Cheverolet occupants were injured.

The speed limit for this highway was posted at 55 miles per hour. The driver had entered the highway about 40 miles south of the accident site and had been driving for about 1 hour. Marks on the highway indicate that the low -boy trailer was parked on the shoulder about 2 feet 5 inches from the right lane line and traveled about 9 feet following the collision. The bulldozer blade was 9.75 feet wide and extended beyond the 8 feet low-boy trailer by

about 1 foot on either side. The tinplate coils were secured to the flat bed trailer with wood blocking and 16,000 pound test chains; two for each coil. The right side of the tractor and trailer were crushed and deformed by the bulldozer blade while the remainder of the tractor received extensive crush damage from the tinplates. There were no tire braking marks located at the accident site, and there were no marks that indicated a sudden steering maneuver by the Mack driver. The low-boy driver was operating under a route restrictive permit at the time of the crash. He was not in compliance with the permit which required the low-boy to exit Interstate 95 prior to the accident site.

The flatbed truck driver reportedly had at least 20 years of experience in heavy vehicle operation. The driver was familiar with the load he was hauling and the highway on which the accident occurred. The driver was employed by a lease operator who was under contract with the motor carrier. He had worked as a driver for this lease operator intermittently for more than 20 years and had no recent history of motor vehicle violations or accidents.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,100 ng/ml of caffeine and was positive for ibuprofen. No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity for stimulant confirmation.

Blood samples were also tested at the request of the State of Maryland. This analysis indicated that the blood sample contained 0.01 percent alcohol and 50 ng/ml of chlorpheniramine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure, for unknown reasons, of the Mack/flatbed combination driver to maintain his vehicle within the proper travel lane. Possibly contributing to the accident was the driver's impairment from a cold and the use of over-the-counter cold medication. Contributing to the severity of the accident was the lack of an adequate barrier between the load and the cab of the power unit.

CASE NO.: 90

Investigation No.: CHI-88-H-TR12
Accident Location: Kenosha County Highway JB, Kenosha, Wisconsin
Lanes: 2 lanes, undivided
Shoulders: 2 feet 3 inches, earthen and gravel
Median: None
Features: Straight, 6 percent upgrade
Date and Time: June 3, 1988, 8:08 a.m.
Ambient Conditions: Clear, dry, daylight, about 70^{0}F
Heavy Truck Involved: 1971 White Constructor 4-axle (including a tag-axle) empty dump truck
Motor Carrier: Jung Brothers, Inc.
Type of Operation: Common carrier
Size of Operation: 31 power units, 33 straight trucks
Total Weight of Truck: 23,800 pounds
Total Length of Truck: 24 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The dumptruck was traveling westbound on a relatively straight section of roadway with a slight upgrade when the truck veered to the right. The truck's right side tires travelled off the road surface onto the right shoulder, tracking 158 feet on the shoulder. The unit then veered to the left back onto the road surface, rotating counterclockwise 38^{0} and leaving approximately 90 feet of yaw marks across both traffic lanes. The truck continued its counterclockwise rotation, entering the left roadside at a 85^{0} angle. The truck dropped down a 53 percent cross slope and the unit overturned onto its right side. The roof of the truck cab impacted a 33 inch diameter oak tree. The truck's roof was crushed downward to the bottom seat cushions by the impact. The truck rotated counterclockwise around the tree and stopped, facing northeast at final rest.

During the rollover and collision sequence the unrestrained driver was ejected from the vehicle. He was found pinned between the right side of the truck cab and the ground; he was fatally injured. The truck cab was extensively damaged by the rollover and collision with the tree.

A witness to the accident stated in summation: he was eastbound on County JB approaching the truck when it ran off the right side of the road with its right side tires. When he passed the truck he watched in his rearview mirror as the truck returned to the roadway, turned sideways, skidded across the road onto the left shoulder and overturned. The witness also stated when the truck first left the roadway he saw an 8 inch long rod (pin) with a flared end fall from the back side of the truck. This pin/rod was recovered by Kenosha County Sheriff's Police.

The accident vehicle was purchased used in April 1988, and leased to a construction material hauler. The truck owner (lessor) was responsible for all maintenance on the vehicle as specified in the equipment lease agreement. A

postcrash inspection of the dumptruck found the unit in disrepair. The following deficiencies were noted: the internal springs for the brake system on the left side of axle #2 were broken and laying loose in the brake and drum area. The brake was taken out of service by disconnecting the push rod from the slack adjuster. The standard hardened steel pins connecting the push rods to the slack adjusters on axle #3 (both sides) were not in place; instead 3/8 x 1.5 inch long steel bolts with double nuts were used for the connections. The inspection of the front suspension on axle #1 revealed the left front hanger and spring assembly was not properly connected/pinned. The existing pin was not a standard pin and extended out far enough on the outboard side of the hanger that the steering drag link was rubbed against it. The right front hanger/spring connecting pin was missing. A witness to the accident reported seeing an 8-inch-long rod/pin fall from the rear of the truck just after the unit veered to the right. This pin was recovered by investigating sheriff's deputies and identified as an 8.5 inch long 1.25 inch diameter farm tractor clevis pin. The pin was grease covered and had brass markings on its surface. The investigating sheriff's deputies noted the front spring hanger pin on the steering axles right side suspension assembly was missing. The deputies searched the accident area for the pin, but could not find anything resembling it. The recovered clevis (draw) pin was placed in the hanger bracket and the investigators discovered it would fit into the hanger's receivers (holes).

Information furnished by the carrier, truck owner, and driver's family indicates this driver had about 12 years of truckdriving experience. This experience ranged from farm trucks to tractor trailer combinations to, most recently, dumptrucks. He had been driving the accident vehicle for approximately 2 months. The driver had no formal truckdriver training; his training consisted of ride-along and practical/hands-on truck driving. A search of driving history revealed the driver was operating the truck with a valid Wisconsin chauffeur's license. A 50-State license check, a NDR check, and a Wisconsin license check indicated the driver had only one valid license.

The carrier has been in operation for approximately 15 years, yet failed to maintain any records on leased drivers or leased vehicles as required by Federal and/or State regulations. The carrier's inspection of the leased vehicles is a visual walk around inspection, as time allows, whenever the vehicle is at the carrier's yards.

Blood samples from the dumptruck driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the dumptruck driver were also tested at the request of the State of Wisconsin with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the mechanical failure of the truck's steering axle suspension due to inadequate maintenance.

CASE NO.: 91

Investigation No.: LAX-88-H-TR14
Accident Location: Eastbound 58th Avenue at S.P. Railroad grade crossing, Thermal, California
Date and Time: June 3, 1988, 3:15 p.m.
Ambient Conditions: Clear, daylight, dry, 90°F
Heavy Truck Involved: 1987 conventional International 3-axle tractor in combination with a 45-foot trailer
Motor Carrier: Dowell Transport, Inc.
Type of Operation: Common Carrier
Size of Operation: 85 power units
Total Weight of Truck: 31,800 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: Train
Truck Fatalities: 2 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The case vehicle was stopped eastbound on 58th Avenue east of SR-111 at the Southern Pacific Railroad grade crossing. The heavy truck was stopped behind a 2-axle stakebed truck, which was proceeding across the double track crossing, while the train was approaching the crossing from the north. Witnesses observed the heavy truck follow the stakebed truck onto the track. However, the heavy truck failed to clear the track in time, and was struck broad side aft of the cab, by the southbound train. According to the train engineer; the train was traveling at 50 mph with its horn activated as it approached the crossing. Upon realizing that a collision was imminent, the engineer and conductor fell to the floor for protection.

At impact the train struck the combination vehicle on the left side of the tractor between axles number one and two. As the train continued south past the crossing, the trailer was separated from the power unit. The major portion of the trailer rear of the refrigeration unit, remained at the grade crossing. The truck tractor, however, was scattered over a distance of approximately 1,884 feet. Both occupants of V-1 were ejected. The driver was located on the eastside of the tracks 727 feet south of the grade crossing. The passenger was located on the eastside of the tracks 113 feet south of the grade crossing. The tractor frame rail and subsystem was wrapped around the lead locomotive and located 1,884 feet south of the grade crossing.

The grade crossing was located in a unincorporated rural farm community. The crossing was straight, level, and without sight restrictions. Weather and surface conditions were excellent. The crossing was equipped with posted railroad crossing signs, dual flashing red signal lights with an audible warning tone. Additionally, there were white painted railroad crossing markings upon the roadway surface. All roadway traffic controls, and railroad crossing devices and signals were functioning at the time of the collision.

A review of the drivers logs found at the scene revealed that the vehicle arrived in Long Beach, California, on 6-2-88 at approximately 11:30 p.m. PDT. The vehicle was scheduled to off-load honeydew melons at 3 Harbors Trucking

located at 1329 West 14th Street, Long Beach, California, on the morning of 6-3-88 at 7:30 a.m., the log shows Michael as the driver. No other log entries were found. Further investigation, revealed that the vehicle arrived in Thermal, California, at approximately 10:30 a.m. on 6-3-88, at Karahadian and Son, Inc., located on 58th Avenue. The load to be picked up was not ready and the drivers were instructed to return in a few hours. The truck and drivers were observed at 2 p.m. at Kool Co. Inc., 52-112 Industrial Way, Coachella, California, where they loaded 7,800 pounds of grapes and departed at 3:10 p.m. At 3:15 p.m. the collision occurred as the vehicle was enroute back to Karahadian, located east of the grade crossing. The driver of the combination unit could not be identified by anyone at the loading and offloading locations.

The Motor carrier, Dowell Transport Inc., did maintain all required records on file. A review of the carrier's qualification files established that both the driver and passenger were properly qualified to operate the combination unit. The driver had been employed for about 30 days. An Arkansas Department of Finance and Administration Revenue Division Traffic violation report revealed that he was properly licensed and had no traffic violations. The passenger had been employed with the company for approximately 1 1/2 years. The report revealed that he was properly licensed and had 1 violation for speed and 1 for a prohibited pass.

A 50 state check did not show any other licenses held by either driver. The National Driver Register check returned negative. Additionally, a Safety Compliance Review and Audit was conducted on 2-16-88 by the Office of Motor Carrier Safety. A "satisfactory" compliance rating was assigned on 7-13-88.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and analysis according to the toxicological protocol. CHT determined that the blood sample contained 0.02 percent alcohol. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

Blood samples from the truck passenger were also sent to CHT for analysis. CHT determined that this sample contained 2,700 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the passenger were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this collision was the failure of the truckdriver, for unknown reasons, to yield to the passing train.

CASE NO.: 92

Investigation No.: MKC-88-H-TR15
Accident Location: Cox Valley Road, 2 miles south of Crab Orchard, Tennessee
Lanes: 2 lanes, undivided
Shoulders: West shoulder, 1 foot dirt surface,
east shoulder, 3 feet dirt surface
Median: None
Features: Rolling hills and curves
Date and Time: June 5, 1988, 10 p.m.
Ambient Conditions: Clear, dry, and dark
Heavy Truck Involved: 1986 International COE tractor
Motor Carrier: P. D. Q. Transportation, Inc.
Type of Operation: Common Carrier
Size of Operation: 138 power units
Total Weight of Truck: Unknown
Total Length of Truck: 22 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

An International tractor was travelling south on Cox Valley Road. As the tractor came over a hill, the road became very bumpy because of several shoving bumps in the asphalt. As the brakes were applied, the rear tandem wheels began to bounce, leaving skip skid tiremarks. The number three axle came loose on the left side of the tractor. When the axle came loose, it was dragged behind the tractor forcing the tire on the right to jam up against the tire on the number two axle and the tractor was pulled to the right side of the roadway. The tractor went through the ditch and up a 35 percent embankment for 46 feet, went airborne for 44 feet and hit a tree 15 feet off the ground. After striking the tree, the rear of the tractor turned left and fell to the ground on its left side. The number three axle became disconnected from the tractor and came to rest approximately 5.5 feet south of the number two axle.

This accident resulted in substantial damage to the tractor on the left side. The truckdriver was found pinned in the wreckage with fatal injuries. It is unknown if the driver was using any safety restraint at the time of the accident.

This driver had thirteen years of education, but no formal commercial driver training. He had seven years of truckdriving experience when he came to this company on April 12, 1988. His application for employment asked if his license permit or privilege been suspended or revoked, and he indicated "No." His license was suspended in Florida on February 20, 1980, because he failed to appear on a traffic summons. A driver license check with Texas revealed that he has a valid Class A license in that state with no violation or accident on his record. A 50-state driver's license check found that his license was also suspended in Virginia. A record check with Tennessee

revealed his driver's license was expired, but he had a driving record commencing in 1976 until 1985. The record indicated that he had four accidents, one driving while intoxicated, and his license was suspended on October 1, 1985.

The driver indicated on his application for employment that he was married and the company issued a passenger authorization to his wife. However, it was determined that he was not married. During the interview with his girlfriend, she stated that this was the first trip that she had not accompanied the driver since he became employed with this company. She also stated that she drove the truck a lot of the time because the driver was trying to get her qualified as a driver for the company, but she only had a driver's license qualifying her for light vehicles.

The driver's record-of-duty status indicated that from the time the driver went to work for the company on April 11, 1988, until the day of the accident, the driver was over the 60-hour/7-day and the 70-hour/8-day rule for 36 of the 56 days he was employed. On April 25 and May 3, the driver's record-of-duty status indicated that the driver drove more than 10 hours and was on duty for more than 15 hours without being off-duty eight consecutive hours. The company issued a compliance notification/logging violation to the driver on May 5, for driving over the ten-hour rule on April 25 and for exceeding 70 hours on his logs. The driver was found to be using two log books from April 23, 1988, through May 5, 1988. The second log book indicated that the driver was off duty from April 23, until April 30. The second log also indicated that the driver left a day ahead of when he actually left.

Witnesses stated that the driver was in a bar on the day in Crab Orchard on the day of the accident, drinking beer and shooting pool for approximately four hours. While he was in the bar, he offered marijuana cigarettes to several persons while he was smoking one. Also, while in the bar, he offered several persons one of the white pills that he took. When he left the bar, he bought a six pack of beer and gave a ride to two other persons. After the accident, an empty beer package was found in the truck.

An examination of the tractor revealed that the rear hanger assembly pin was missing on the left side of the rear axle. The bottom of left spring did not show any evidence of pin wear as the spring on the right side.

The Office of Motor Carriers did an safety compliance review on this company on April 10, 1985, and found that the company was :

1. Requiring or permitting driver to drive more than 10 hours.
2. Requiring or permitting driver to drive after having been on duty more than 70 hours in 8 consecutive days.
3. Requiring or permitting driver to make false entries upon a record of duty status.

Crab Orchard, Tennessee
Case No. 92

The Office of Motor Carriers did another safety compliance review on this company on March 29, 1988, and found that the company was :

1. Requiring or permitting driver to drive more than 10 hours.
2. Requiring or permitting driver to drive after been on duty 15 hours.
3. Requiring or permitting driver to drive after having been on duty more than 70 hours in 8 consecutive days.
4. Requiring or permitting driver to make false entries upon a record of duty status.
5. Requiring or permitting driver declared out of service to operate a motor vehicle before prescribed off duty (or sleeper berth) time has been accumulated. (Driver was instructed to return to Humboldt, Tennessee, after being ordered out of service in Ohio.)

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.10 percent alcohol, 22 ng/ml of the psychoactive component of marijuana (THC), 17 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and an 11 percent saturation of carbon monoxide. Ephedrine and pseudoephedrine were detected and confirmed; However, insufficient sample volume precluded quantitation. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of Tennessee. This test indicated that the blood sample contained 0.09 percent alcohol.

Screening for other drugs, such as marijuana, was not done by the Tennessee laboratory. The Tennessee alcohol report is in good agreement with that value found by the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's impairment due to multiple drug use; alcohol, marijuana, and ephedrine. Contributing to the accident was the poorly maintained vehicle suspension system and the poorly maintained roadway surface.

CASE NO.: 93

Investigation No.: CHI-88-H-TR13
Accident Location: County Highway G, 5 miles east of Ladysmith, Wisconsin
Lanes: 2 lanes, undivided
Shoulders: Gravel, 5 feet wide
Median: None
Features: Straight, level roadway, approaching a right curve.
Date and Time: June 8, 1988, 7:38 a.m.
Ambient Conditions: Daylight, cloudy weather, dry pavement
Heavy Truck Involved: 1977 White tractor in combination with a flatbed trailer loaded with lumber
Motor Carrier: Weathershield Transportation, Ltd.
Type of Operation: Common and Contract Carrier
Size of Operation: 76 power units
Total Weight of Truck: 63,320 pounds
Total Length of Truck: 57 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination vehicle was traveling east on a straight, level section of roadway when it exited the right side of the roadway, crossed the roadside area and a dirt access drive, and entered a cultivated field of wheat. The vehicle travelled approximately 800 feet southeast from the point where it exited the roadway and passed through the wheat field and rolled to a stop.

The unrestrained truckdriver was found slumped over in the driver's seat of the truck--dead from a heart attack.

This driver started work at 5:19 a.m. the morning of June 8, 1988. He had been on duty approximately 2 hours when he picked up a load in Ladysmith, Wisconsin, to transport to Medford, Wisconsin, 65 miles away. The load of lumber was being taken to another factory location of the shipping company.

An officer of the Wisconsin State Patrol conducted an examination of the combination vehicle following the accident after it had been driven 4.9 miles back to the local plant where the trip had begun. This examination found two of the seven leafs of the right front axle spring broken, and listed this vehicle out of service until this defect had been repaired. No other mechanical deficiencies were found during an examination of this combination vehicle.

The truckdriver had more than 20 years experience operating heavy trucks. He had been employed by a motor carrier for 18 years and had retired from that company in 1983 at age 57. He was currently employed as a part time, intrastate driver with one of the 18 different contractors from which the motor carrier leased tractors and drivers. He had been employed by that contractor since 1985, and worked only a few weeks a year according to the motor carrier safety director.

Ladysmith, Wisconsin
Case No. 93

A 50 state operator's license check regarding this driver located only one regular and one chauffeur's license, both issued by the state of Wisconsin, with valid status.

According to the pathologist who performed the autopsy of this driver, the first two elements of the final anatomic diagnosis were listed as "complete occlusion left anterior descending coronary artery due to... severe atherosclerotic vascular disease." The cause of death was listed as "acute cardiac dysfunction."

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Wisconsin with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the driver due to cardiac failure.

CASE NO.: 94

Investigation No.: LAX-88-H-TR15
Accident Location: Eastbound State Route 138, east of Wrightwood, California
Lanes: 2
Shoulders: None
Median: None
Features: 4 percent downgrade, straight, mountainous
Date and Time: May 16, 1988, 1:22 p.m.
Ambient Conditions: Clear, daylight, dry, 90°F
Heavy Truck Involved: 1977 International COE 2-axle tractor
Motor Carrier: A. V. Trailer Transport
Type of Operation: Common Carrier
Size of Operation: 2 power units
Total Weight of Truck: 13,840 pounds
Total Length of Truck: 16 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The case vehicle was traveling eastbound on SR 138 east of SR-2. Witnesses indicated that the vehicle was traveling at a high rate of speed as it entered the construction zone monitored by the California Department of Transportation. SR 138 at the accident location was a two lane highway, divided by a painted double yellow centerline. The roadway in the eastbound direction descended an approximate four percent grade with steep downward embankments on both sides. At the time of the collision, CAL-TRANS was working on the roadway, and had placed six signs over a distance of .8 of a mile on the eastbound approach to the work site. CAL-TRANS was using pilot cars to escort traffic through the work site by alternating the traffic pattern groups. Witnesses indicated that the case vehicle was traveling at speedand, when it came upon traffic stopped within the construction area ahead, it veered to the left, crossed into the westbound lane, and plunged over the north embankment. The vehicle overturned and the driver was killed.

The unrestrained truckdriver was ejected from the vehicle and received fatal injuries. The tractor sustained major damage to the cab, with substantial deformation noted on the driver's side. The engine and drive train sustained moderate damage.

The carrier had employed the driver in March of 1988. On the day of the collision the driver was enroute to Hemet, California, from Lancaster, California (130 miles), to pick up a trailer for delivery to Mammoth, California. However, the driver ran off the roadway approximately 60 miles east of Lancaster. The 63-year-old driver held a valid class 1 operator's license for the type of vehicle being driven and also a valid medical certificate. A California Department of Motor Vehicle record check revealed that the driver received a citation on 4-7-88 for failing to stop at a posted stop sign in Lancaster, California, while driving the accident

vehicle, and was convicted on 5-3-88. A National Driver Record check, and 50-state license check were both returned negative. His driving history was void of accidents.

The carrier was a for-hire carrier with two power units The carrier had no ICC authority and operated in California only. The carrier began operations in 1987 and has never been audited. The carrier did maintain a driver qualification file on the driver, but driver logs were not available for review.

A visual inspection of the tractor found the brake assembly and subsystem in good repair. The steering assembly and subsystem was also found to be in good repair. Overall, the tractor appeared to be well maintained. The vehicle was last serviced on 4-22-88 and had a complete brake job on the rear on 10-3-87. The left rear dual tires were bald--all other tires were excellent.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This screening indicated the presence of acetaminophen, nicotine, and caffeine. No confirmation or quantification tests were performed.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this collision was the driver's apparent disregard of multiple warning signs on his approach to the construction area.

CASE NO.: 95

Investigation No.: MKC-88-H-TR16
Accident Location: U.S. 127, 9 miles east of Byrdstown, Tennessee
Lanes: 2 lanes, undivided
Shoulders: 2 feet dirt, on both right and left sides
Median: None
Features: "S" curve, with 6.5 percent grade and 9-percent superelevation
Date and Time: June 9, 1988, 1:30 p.m.
Ambient Conditions: Cloudy and dry
Heavy Truck Involve: 1984 Ford CL-9000 tractor in combination with a loaded 48-foot trailer
Motor Carrier: Rogers Trucking Company
Type of Operation: Common Carrier
Size of Operation: 27 power units
Total Weight of Truck: 55,148 pounds
Total Length of Truck: 64 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was southbound, negotiating the left curve of back-to-back curves. The curve was posted with a recommended speed of 30 mph. Just as the combination unit reached the point where the right curve began, where the superelevation was in transition from the left curve to the right curve, the yawmark ended and the vehicle rolled off the travelway. Investigators estimated the vehicle's speed at the beginning of the yawmerk at 47 mph.

The tractor sustained substantial damage to the right front and top of the cab. The right front of the cab was displaced rearward and downward to the bottom of the windshield frame. The top right front corner of the trailer was displaced rearward and downward from the impact with the rock ledge. The unrestrained driver was found pinned in the right side of the cab by the displaced cab roof. The accident resulted in fatal injuries to the driver who was alone in the vehicle. There were no other involved parties nor injuries in the accident.

This driver had no previous heavy truck driving experience nor any formal training. He had four months driving experience, all with this carrier as a owner operator. The driver received one speeding citation for driving 71 mph in a 55 mph zone in 1983, and a second speeding citation on March 18, 1986, for speeding 40 mph in a 20 mph school zone. He failed to appear on this citation and, as a result, the State of Indiana suspended his driving privileges indefinitely on May 30, 1986. Then on February 4, 1988, he applied for and received a chauffeur's license in Kentucky.

Byrdstown, Tennessee
Case No. 95

This company was audited by the Office of Motor Carrier Safety on December 5, 1984, and was issued an unsatisfactory rating on March 25, 1985. On September 4, 1985, a followup inspection was performed. The carrier was still rated unsatisfactory and a $3000.00 penalty was assessed. This carrier's accident rate was 4.56 per million miles, while the average nationwide was 1.12 per million miles traveled. A review of the driver's record of duty status (log book) for the previous 30-day period indicated that he drove in excess of 10 hours on two occasions: on one day, he drove 13.5 hours and the other day he drove 12.5 hours following 8 hours off duty, both in violation of CFR 49-395.3.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for his vehicle and load on the roadway curvature. Contributing to the accident was the driver's inexperience with heavy trucks. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 96

Investigation No.: CHI-88-H-TR14
Accident Location: State Highway 29, 6 miles west of Withee, Wisconsin
Lanes: 2 lanes, undivided
Shoulders: 10 feet wide
Median: None
Features: Straight roadway
Date and Time: June 10, 1988, 4:15 p.m.
Ambient Conditions: Clear weather, dry roadway
Heavy Truck Involved: 1982 Ford Tractor in combination with a loaded van trailer
Motor Carrier: Valley Bakers Cooperative
Type of Operation: Private Carrier
Size of Operation: 7 power units
Total Weight of Truck: 37,000 pounds
Total Length of Truck: 51 feet
Other Vehicle Involved: 1984 Winnebago motor home, towing a fiberglass pleasure boat with a one-axle boat trailer

Truck Fatalities: 1 **Truck Injuries:** 1
Other Fatalities: 2 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination was traveling west at approximately 55 mph when an eastbound motor home crossed into the westbound lane and struck it head-on. The vehicles came to rest in the westbound lane with the tractor right side tires on the north roadway shoulder and the motor home in the westbound lane. Witnesses reported an explosion when the impact occurred. Both vehicles were destroyed by a fire following the collision. Tire braking marks from the combination were found in the westbound lane of the roadway. No other tire marks were found.

The truckdriver and both occupants of the motor home were fatally injured during the collision. The passenger of the Ford tractor was able to escape through the cab window with the assistance of collision witnesses, but suffered lacerations, second and third degree burns, and was hospitalized.

The truckdriver had been operating tractor trailer combination vehicles for the past 3 of his 4 years of employment with this company. He drove first as a relief driver until February of 1988, when he became a regular driver. This driver had received no formal training, but learned to operate a combination vehicle through on-the-job training with an experienced company driver, in a ride along and drive-along program.

Copies of the log books of this driver were obtained from the motor carrier; however, the log book for the day of the accident was destroyed by the fire. The truckdriver was delivering bakery products along a route he travelled on Fridays. The log book page for Friday, June 3, 1988 (exactly one week before the accident), showed the driver covered this route of 391 miles from 3:30 a.m. to 5:45 p.m. The accident occurred approximately 6 miles east of the first of the final two delivery stops on the route.

Withee, Wisconsin
Case No. 96

The truckdriver had started work at 3:30 a.m. and, according to the motor carrier, had been driving about 45 minutes since his last break when the accident occurred. The motor home occupants were returning to their homes in Stevens Point, Wisconsin, from a fishing trip vacation in Thunder Bay, Ontario, Canada (a distance of approximately 400 miles from the accident area). A propane tank was located on the outboard side of the right side frame rail, aft of the right front wheel of the Winnebago motor home. The autoignition temperature of propane is 874 degrees fahrenheit.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,200 ng/ml of caffeine and a 41 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Wisconsin with negative results. The Wisconsin laboratory screened for alcohol only. In addition, this laboratory did not determine the carbon monoxide saturation.

Blood samples from the motor home driver and passenger were tested at the request of the State of Wisconsin. These tests indicated that the driver's blood contained 0.01 percent alcohol and the passenger's blood contained 0.05 percent alcohol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the motor home driver due to fatigue.

CASE NO.: 97

Investigation No.: ATL-88-H-TR14
Accident Location: North Carolina 55, 18 miles west of New Bern, North Carolina
Lanes: Asphalt, two 10-foot wide lanes
Shoulders: Grass; 4 feet wide each side
Median: None
Features: At grade; level with left curve
Date and Time: June 13, 1988, 6:30 p.m.
Ambient Conditions: Clear, bright sun, and dry
Heavy Truck Involved: 1982 White tractor in combination with an empty trailer
Motor Carrier: Hampton Industries, Inc.
Type of Operation: Private Carrier
Size of Operation: 2 power units
Total Weight of Truck: 22,500 pounds
Total Length of Truck: 53 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit traveled west on NC 55 enroute to Kinston, North Carolina. The lone driver was restrained with a lap/shoulder belt. Traveling along a level 0.8-mile-long tangent portion of roadway, the vehicle approached a 700-foot long five degree left curve. The bright, late-afternoon sun was at his left forehead. Entering the left curve, the vehicle did not turn with the curve and continued straight ahead off the roadway. It crossed the shoulder and entered a roadside ditch. Continuing straight ahead, the vehicle impacted a dirt embankment before crossing a private drive. About 101 feet from where it left the roadway, the vehicle struck and broke a 22-inch diameter tree. The vehicle continued ahead another 65 feet before it came to rest in an open field. No tire marks were found on the roadway. From the beginning of the curve, tire prints marked the path of the vehicle to the tree. The investigating police estimated the preaccident speed of the vehicle at 55 mph.

The tractor was destroyed. The initial impact was left from the left frame rail. About 10 inches from the left side of the cab, the firewall was deformed inward about 20 inches. The intrusion into the cab substantially reduced the occupant space in the driver position of the cab. The driver was crushed and died immediately from "multiple trauma," particularly massive head injuries. The trailer sustained minor damage.

The 39-year-old truckdriver had been employed by the motor carrier for about 17 years. He had been a regular driver of heavy trucks for over 12 years. His training included a one-week initial training course, primarily orientation and coach-pupil, and about one hour of inservice training per week thereafter. The truckdriver held a valid North Carolina Class A driver license with no restrictions. His driving record for the last seven years showed no traffic convictions or accidents.

New Bern, North Carolina
Case No. 97

The motor carrier was primarily a garment manufacturer, with seven factories in North Carolina and two in Virginia. Its transportation of cargo by truck was in support of the manufacturing enterprise. The carrier maintained a Driver Qualification File for the truckdriver in compliance with Federal Motor Carrier Safety Regulations (FMCSR). Examination of the file revealed no irregularities or evidence of any causal factor for the accident. The truckdriver was in compliance with hours of service regulations. At the time of the accident, he had been on duty about 10.3 hours. He drove about one-half of the on-duty time. Recent off-duty activities included being away from home at church-related functions much of the weekend before the Monday accident. Reportedly, he slept only about five hours, from 2 a.m. until 7 p.m., the night before the accident (he normally slept about 7 hours each night). It was also noted that the driver usually went off-duty at 4 p.m.; 2 hours earlier than the time of the accident.

No autopsy was performed. The Medical Examiner stated that an autopsy was not necessary to determine the cause of death; therefore, none was authorized.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to fatigue.

CASE NO.: 98

Investigation No.: SEA-88-H-TR14
Accident Location: Interstate 10, 2 miles north of Palm Springs, California
Lanes: 8 lanes, divided
Shoulders: Right shoulder, 9 feet, asphalt
Left shoulder, 6 feet, of asphalt
Median: 40 feet of ditched dirt and gravel
Features: At grade, straight, 1.5 percent upgrade
Date and Time: June 16, 1988, 4:40 a.m.
Ambient Conditions: Clear, dry, and warm
Heavy Truck Involved: 1981 Peterbilt COE tractor in combination with two loaded 28-foot flatbed trailers
Motor Carrier: Troost Hay Co., Inc.
Type of Operation: Common and Contract Carrier
Size of Operation: 52 power units
Total Weight of Truck: 76,420 pounds
Total Length of Truck: 67 feet
Other Vehicle Involved: 1988 Peterbilt conventional tractor in combination with two loaded 24-foot bin trailers

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The 1981 Peterbilt tractor and double trailers loaded with hay were traveling west on Interstate 10. A 1988 Peterbilt pulling two trailers loaded with tomatoes had stopped westbound alongside the road between the off-ramp and the overcrossing for Palm Drive. As the tomato truck had pulled back onto the roadway and was accelerating, it was struck in the rear of the last trailer by the hay truck. The first tire marks on the roadway were found in the outside lane 98 feet west of the overcrossing and about 800 to 1000 feet west from where the tomato truck had been stopped on the shoulder. The hay truck came to rest about 225 feet past the first tire mark found on the road, while the tomato truck continued forward and came to a stop several hundred feet in front of the hay truck. In his statement, the driver of the tomato truck said he was traveling 35 to 45 mph when he was hit. Another driver of a hay truck following the 1981 Peterbilt stated that the tomato truck driver told him he was only moving about 20 mph at the time of the collision.

The front of the 1981 Peterbilt received extensive rearward crushing above the bumper. The rear of the cab was also pushed forward, and both cab mounts at the rear were broken off, allowing the cab to pivot forward. The fifth wheel plate on the tractor had sheared off and was found attached to the first trailer. No damage was reported for the 1988 Peterbilt tractor; however, the rear of the second tomato trailer and its drawbar were found damaged. The unrestrained driver of the hay truck was found pinned in the cab, and partially ejected through the front windshield. No injuries were received by the lapbelted driver of the tomato truck.

The last entry in the hay truckdriver's log book was 11.5 hours before the accident. Information from the log book and another haytruck driver

revealed that he most likely had only slept 4 hours in three separate periods in the 24 hours prior to the accident, and that he had been awake and active for 18 hours before the accident.

An examination of the haytruck's brake system found six of its ten brakes out of adjustment. The filaments on the left front headlight and the right rear running light showed stretching and deformation. One of the running light filaments from the rear trailer hauling tomatoes also showed deformation.

The driver of the hay truck possessed one valid California class 1 driver's license. He had 5 violations in the past 5 years (one for speeding), but had not been involved in any accidents in that span. He had 14 years experience in heavy trucks, but had not received formal training.

Blood samples from the 1981 Peterbilt driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 500 ng/ml of methamphetamine, 90 ng/ml of ephedrine, 1 ng/ml of the psychoactive component of marijuana (THC), 18 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 1,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the 1981 Peterbilt driver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 604 ng/ml of methamphetamine, 78 ng/ml of amphetamine, and 0.02 percent alcohol.

The California laboratory did not test the blood sample for marijuana, ephedrine, or caffeine. The positive blood alcohol of 0.02 percent reported could not be reconciled with the negative Center for Human Toxicology finding. However, this concentration is small and could be due to background or putrefaction.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the 1981 Peterbilt driver due to fatigue and multiple drug use; methamphetamine and/or amphetamine, marijuana, and ephedrine. Contributing to the accident was the poor conspicuity of the leading vehicle's flatbed trailer.

CASE NO.: 99

Investigation No.: DEN-88-H-TR13
Accident Location: Interstate 80, 11.1 miles east of Truckee, California
Lanes: 4-lanes, divided
Shoulders: Right, 12-foot asphalt with a "W-beam" guardrail; Left, 6-foot asphalt
Median: 3-foot asphalt with concrete barrier
Features: Left hand curve with a 6 percent downgrade
Date and Time: June 15, 1988, 9:25 p.m.
Ambient Conditions: Clear, dark
Heavy Truck Involved: 1986 International tractor in combination with a loaded 48-foot trailer
Motor Carrier: Truck One, Inc.
Type of Operation: Common Carrier
Size of Operation: 201 power units
Total Weight of Truck: 73,240 pounds (approximate)
Total Length of Truck: 65 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 2
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was traversing a 6 percent downgrade in a left curve with a radius of 1150 feet. The combination left 345 feet of centrifugal skid marks to where it struck a 36-inch-high concrete median barrier, leaving 20 feet of scrape and gouge marks along the barrier. The vehicle then rolled onto its right side with the aft end of the trailer colliding with the 24 inch high "W-beam" guardrail. The unit left 375 feet of gouge and scrape marks on the roadway, then rolled over the guardrail and down a ravine, coming to rest 80 feet south of the south edge of the roadway with the driver and a 4-year-old passenger lying on the ground just east of the tractor. During the accident sequence, a second passenger was ejected and was found lying on the south shoulder. The tractor and trailer remained attached and were resting against a large tree that had been knocked down during the accident. The load of lumber had broken loose and spilled over the entire accident site.

The accident resulted in fatal injuries to the unrestrained driver and serious injuries to the two unauthorized passengers. The tractor and load of lumber were destroyed, and the trailer received moderate damage. Four hundred and twenty feet of guardrail and post were damaged in the accident.

The driver had 11 years of truckdriving experience before employment with this carrier. He was hired by the carrier five months before the accident. The carrier provided 8 hours of classroom training and a 35 mile road test. The driver had attended the company training. A three year check of the driver's driving record revealed that he had been issued the following citations: two speeding, one parking on the roadway, one failure to appear, and had one conviction for one no motor vehicle insurance. There was no record accidents for this same period.

Truckee, California
Case No. 99

The driver's log book was not completed for the day of the accident. On the day of the accident the driver made one delivery and one pickup. He had driven 455 miles between 9 a.m. and 9:25 p.m., when the accident occurred. The driver had slept only 4 hours in the last 24 hours and had been active for the 18 hours leading up to the accident.

Pills were found in the wreckage debris at the accident site and in the driver's briefcase and suitcase. Tests on these pills revealed that they contained ephedrine and caffeine.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3 ng/ml of the psychoactive component of marijuana (THC), 66 ng/ml of the non-psychoactive component of marijuana, and 160 ng/ml of ephedrine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This screening test indicated the presence amphetamine and cannabinoids in the urine test. They were unable to confirm the presence of amphetamines by thin layer chromatography.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to multiple drug use (marijuana and ephedrine) and fatigue.

CASE NO.: 100

Investigation No.: DEN-88-H-TR14
Accident Location: Interstate 10, Beaumont, California
Lanes: 6 lanes, divided
Shoulders: Right shoulder, 10 feet wide, asphalt
Left shoulder, 15 feet wide, asphalt
Median: New Jersey barrier
Features: Straight with slight downgrade
Date and Time: June 20, 1988, 4:15 a.m.
Ambient Conditions: Clear, calm, temperature 58° F
Heavy Truck Involved: 1968 Peterbilt in combination with 2 loaded 24-foot flatbed trailers
Motor Carrier: H & S Trucking
Type of Operation: Common Carrier
Size of Operation: 12 power units
Total Weight of Truck: 79,500 pounds
Total Length of Truck: 63 feet
Other Vehicle Involved: 1977 Peterbilt in combination with two loaded 24-foot flatbed trailers

Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 1

FACTUAL SUMMARY:

The 1968 Peterbilt tractor was westbound on Interstate 10 in the right outside lane. The driver of the 1977 Peterbilt tractor that was following behind the truck stated that the combination slowed suddenly, for no apparent reason. No brake lights were observed during the slowing action. The driver of the trailing truck pulled into the middle lane to pass the slowing truck combination. During the passing maneuver, the slowing truck veered left into the path of the passing truck. The driver of the passing truck braked hard and the truck jackknifed. The right front corner on the front trailer of the passing truck collided with the left rear corner on the rear trailer of the slowing truck. The jackknifed truck came to rest near the New Jersey concrete divider, with the tractor facing east and its trailers still attached facing in a westerly direction. The slowing truck struck the New Jersey concrete divider at a glancing angle, slid along the divider for about 200 feet, and came to rest against the divider facing west with the trailers still attached.

During the accident events the driver of the 1968 Peterbilt was ejected via the driver's door and was run over. He died at the scene. The other driver received minor injuries. There were no seat belts in the tractor of the fatally injured driver. The inside door handle on the driver's side was a protruding rounded lever pointing to the seven o'clock position, and would release the door latch when bumped or slightly pushed on.

The 1968 Peterbilt received moderate damage. The 1977 Peterbilt received minor damage. All four trailers received minor damage and were placed back into service immediately after the accident.

Beaumont, California
Case No. 100

A postcrash inspection of both tractors, performed jointly by the investigating police agency and NTSB, revealed no evidence of preaccident failure or deficiencies.

An investigation into the fatally injured driver's employment history revealed that he had 25 years truckdriving experience. He had no formal truckdriver training. He was hired by his present employer in May 1986. Prior to this, he was a truckdriver for several different carriers. A search of his driver history records revealed that the driver had a valid California Class 1 license with four traffic violation convictions and one accident in the last three years. The traffic violations were for driving left of center line at an approach to an intersection or railroad grade crossing, exceeding the legal driving hours in a tractor, and speeding. The National Drivers Register (NDR) had no listing on the driver.

According to statements from other carrier employees and family members, the driver's 24-hour activities prior to the accident included one hour of quality sleeping at the beginning of the 24-hour period, 8 1/2 hours of off-duty time that was spent preparing for and participating in the family reunion activities on Father's Day, and 14 1/2 hours of on-duty time, with 9 of those hours driving. At the time of the accident, the driver still had about 500 miles to drive before reaching his destination. Additionally, the driver would have received a $50 bonus if he delivered his cargo of tomatoes to the processing plant within 12 hours of the time he was loaded at the farm field.

Driver's log books found in the wreckage showed some dual entries with the same date but different work hours and locations listed. Also, some entries showed the solo driver terminating trips at one location, being off-duty, and then starting another trip at his home location, many miles from the ending location with no driving times.

The motor carrier had been in business since 1974, and was an intrastate common carrier regulated by the California Public Utilities Commission (CPUC) and subject to California Motor Carrier Safety Regulations. As of the accident date, the CPUC had not conducted a safety audit of the carrier. Carrier officials were neither knowledgeable of nor applying the Motor Carrier Safety Regulations. Payroll records were the only documents that the carrier had on the driver.

Blood samples from the 1968 Peterbilt driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the 1968 Peterbilt driver were also tested at the request of the State of California with negative results.

Beaumont, California
Case No. 100

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the 1968 Peterbilt driver due to fatigue. Contributing to the severity of the accident were the lack of a restraint system at the driver's seat and the protruding inside door handle on the driver's door.

CASE NO.: 101

Investigation No.: LAX-88-H-TR16
Accident Location: Unofficial brake inspection area, Interstate 5, 2 miles north of Wheeler Ridge, California
Lanes: None
Shoulders: None NOTE: 85-100 foot wide dirt turnout for self inspection of truck condition, e.g., brakes, before official weight station.
Median: None
Features: Dirt, 1-2 percent upgrade southbound
Date and Time: July 6, 1988, 5:54 a.m.
Ambient Conditions: Dark, clear, dry
Heavy Truck Involved: 1984 Freightliner 2-axle COE tractor in combination with two loaded 28-foot trailers
Motor Carrier: Lloyd/Cannon Trucking, Inc
Type of Operation: Common Carrier
Size of Operation: 31 power units
Total Weight of Truck: 44,485 pounds
Total Length of Truck: 68 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit had been southbound on an arterial north/south interstate, approaching the California Highway Patrol Weight Station/Inspection facility at Wheeler Ridge. The location of this station preceded a 10 mile, 6 percent upgrade. Approximately 3 miles before the station, the road configuration provides a bypass for commercial traffic destined for the scales. Approximately one mile later, a wide dirt section of the right road edge area was graded (or driven flat) with a 1 to 2 percent upgrade southbound to prevent runaways. The driver of the combination unit pulled into this area and stopped his truck. According to witnesses the engine was running and the "blue valve" (the tractor brakes) were set, and the driver exited the cab enroute to the rear of the unit, apparently to adjust his brakes.

Witnesses reported that the driver proceeded to the rear of the first trailer and positioned himself between the center rear of the first trailer and the center to right front of the rear trailer. The witness then turned to his own activities. Approximately 5 minutes later he noticed that the truck had jackknifed. He went to see what had happened and located the combination unit driver, with a 9/16 inch wrench at his feet, trapped between the trailers and apparently deceased. There was no damage to the combination unit. The driver succumbed to a crushed chest and a spinal transection.

The witness who discovered and released the driver from between the trailers related that when he pulled the unit forward and set the tractor brakes, they failed to hold the unit. He had to apply the "yellow button" which sets all the brakes on the unit. A postcrash examination by the

personnel from the CHP facility revealed that the tractor brakes were so seriously out of adjustment that they were disfunctional.

There were no preexisting medical conditions, apparent debilitations, or deficiencies in the combination unit driver. The driver had been a truckdriver for more than 20 years and had received company training. He had an excellent record with this carrier. His California motor vehicle record indicated two violations for maximum truck speed, one violation for operating against a license restriction, and one violation for not having a proper hitch on a truck. There were no accidents reported in this three year period. It should be noted that as recently as March 10, 1988, he was recorded as driving a tractor other than the one involved in this accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,300 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This screening also detected the presence of caffeine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the driver and/or the carrier to maintain the vehicle's brakes in serviceable condition.

CASE NO.: 102

Investigation No.: LAX-88-H-TR17
Accident Location: Westbound Interstate 10 near Cabazon, California
Lanes: 8 lanes, divided
Shoulders: 10-foot asphalt shoulder right side, 8 foot asphalt shoulder left side
Median: 35 - 40-foot dirt median
Features: At grade level, limited access
Date and Time: July 7, 1988, 12:20 a.m.
Ambient Conditions: Clear, dark, dry
Heavy Truck Involved: 1973 Freightliner 3-axle COE in combination with an empty 42-foot tank trailer
Motor Carrier: Valley Spreaders, Inc.
Type of Operation: Common Carrier
Size of Operation: 15 power units
Total Weight of Truck: 27,000 pounds
Total Length of Truck: 54 feet
Other Vehicle Involved: 1969 International Loadstar stakebed produce truck loaded with watermelons and a 1981 Chevrolet Citation

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 2

FACTUAL SUMMARY:

The Freightliner combination was traveling west in the W-4 (slow) lane on a straight portion of an interstate highway which traverses the inland desert. Witnesses reported the combination unit to be traveling approximately 60 mph and the driver to be conversing on the citizen's band radio with a following truck. The International stakebed truck was pushing a disabled passenger car at a witness estimated speed of 15 miles per hour. Witnesses reported, and a later filament analysis confirmed, that the taillights on the International truck were functioning. There was no evidence that the Freightliner driver took any evasive maneuvers before the combination unit impacted and overrode the rear frame of the International truck. The impact imbedded the tractor of the Freightliner in the rear of the International truck. The International spun around clockwise through approximately 130° traveled 95 feet and came to rest, upright, facing southeast across the W-2 lane. The tractor of the combination unit traveled 115 feet as it also spun counterclockwise through 130°. The trailer jackknifed and spun counterclockwise through approximately 45°. As it came to rest, the left front area impacted and deformed the left rear of the cab. The trailer came to rest, upright, facing southwest astraddle the right shoulder, W-4 and W-3 lanes. The passenger car was hurled approximately 270 feet ahead in the W-4 lane. There was no separation of the combination unit. There were no defects or deficiencies found during a postcrash examination of the combination unit. There was no fuel leak and no postcrash fire.

The combination unit overrode the stakebed truck a minimum of 51 inches. The frame height of the combination unit was approximately 3 inches lower than the stakebed's frame and the majority of the impact force was sustained above the frame line of the tractor. The unrestrained combination unit driver

sustained fatal head injuries. The Freightliner tractor sustained substantial damage while the trailer escaped with minor paint transfers. The unrestrained International driver was trapped in his vehicle by the crush of the stakebed unit, including a 7-6 inch forward movement by the u-brackets which mount the stakebed unit to the truck frame. The International driver sustained moderate head, neck, and back trauma. The unrestrained driver of the passenger car complained of pain. Three unrestrained children in the passenger car were uninjured.

The combination unit driver had graduated from a professional truck driving school. He had been employed by this carrier for more than 10 years. He had been an employee driver before purchasing this tractor and leasing it back to the carrier on a long-term lease. His driving record indicated two equipment violations and no accidents in the previous three years. He had driven this route approximately 400 times per year. It was found that the driver worked a very irregular schedule, sometimes working during the day and early evening, other times working entirely at night. On the date of the accident, he had been working 4 days since his last days off. The driver of the combination following the accident involved International reported that he had been talking to the its driver on his citizen's band radio, but that the radio when it "went dead."

Although the taillights on the International truck were apparently functioning, they were relatively small lights. This truck was not equipped with emergency flashers. Witnesses reported difficulty seeing the stakebed truck. The stakebed unit atop the International truck frame was attached by u-bolts which were strapped to the frame rails. This allowed the unit to move forward and crush the driver compartment.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,900 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

The stakebed driver failed a gaze-nystagmus field test and was arrested for driving under the influence. A subsequent BAC test revealed a .04 percent concentration.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Freightliner driver due to fatigue in combination with the poor conspicuity of the stakebed truck.

CASE NO.: 103

Investigation No.: FTW-88-H-TR08
Accident Location: Interstate 40, 8 miles west of Cookeville, Tennessee
Lanes: 4-lane, divided highway
Shoulders: Right side; 10-foot asphalt shoulder
Left side; 5.6-foot asphalt shoulder
Median: 150-foot earthen median
Features: Upgrade
Date and Time: July 7, 1988, 2:20 p.m.
Ambient Conditions: Clear and Dry
Heavy Truck Involved: 1984 Mack COE 3-axle tractor in combination with a loaded 45-foot trailer
Motor carrier: Kisko Transportation Inc., (dba) Continental Carriers
Type of Operation: Contract Carrier
Size of Operation: 10 power units
Total Weight of Truck: 74,260 pounds
Total Length of Truck: Approximately 60 feet
Other Vehicle Involved: 1985 Ford 8000 COE 3-axle truck
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 1 **Other Injuries:** 1

FACTUAL SUMMARY:

On July 6, 1988, at about 10:30 a.m., the case truckdriver departed his residence for work. At approximately 2 p.m. he departed Linden, New Jersey, on a 1,460 mile trip to Morgan City, Louisiana. On the following day at approximately 2:20 p.m., after having travelled approximately 800 miles of the trip, the driver was involved in a 2-truck collision on Interstate 40 near Cookeville, Tennessee.

The case truck was travelling westbound on I-40 at an estimated speed of 60-68 mph when it collided into the rear of a highway maintenance truck that was travelling at a driver reported speed of 12-15 mph. The maintenance truck was operated by a private contractor that was painting the white shoulder stripe at the time of the accident. According to a witness located behind the case truck, the case truck passed her travelling at approximately 65 mph, then they both passed two trucks in the right lane that were displaying flashing arrow boards directing the traffic into the left lane. The witness stated that these two trucks were close together. She stated that after completing this pass she began to change lanes to the right behind the case truck and then it struck the rear of the maintenance truck. The witness stated that she never saw the truck that was struck by the case truck. Tennessee Department of Transportation personnel stated that there was a 1000-foot interval between each of the trucks and they were on the road shoulder about 500-700 feet behind the pavement striping truck when it was hit. Another truckdriver stated to the Tennessee State Highway Patrol that the case truck was travelling at about 57 mph, but that it was driving erratically.

The witness stated that the female witness was riding in the left lane in front of him, and the accident truck passed the first two arrowboards, changed lanes to the right, and was passing him on the right when it collided into the rear of the pavement striping truck.

Cookeville, Tennessee
Case No. 103

The case truck slid approximately 195 feet after impact and came to rest on the north roadside. The Ford 8000 slid approximately 110 feet after impact and came to rest on the north road shoulder facing east. There were no precrash skidmarks. There was a tireprint on the freshly painted shoulder edgeline beginning at a point approximately 510 feet east of the impact area. At a point about 143 feet east of the impact area, the tire print began to diverge from the edgeline, and led up to the impact area which was 3 feet south of the edgeline. The 30-40 feet of white shoulder edgeline preceding the impact area did not appear to be freshly painted. There was approximately 56 inches of contact damage on the rear of the 96-inch wide pavement striping truck.

According to witnesses, a fire ignited near the pavement striping truck immediately after impact. The fire consumed both trucks and approximately 67 acres of grass and timber on the north roadside. The workman who was positioned on the right rear of the pavement striping truck was killed. He was thrown forward approximately 165 feet from the impact area.

The combination unit was destroyed by the impact forces and fire and the driver was killed. It was not determined if the case truckdriver was restrained. The Ford 8000 received substantial impact and fire damage and the driver received minor injuries from breathing the toxic fumes at the accident scene. The case truck was transporting tolulene, acetone, benzene, and triethylchloride at the time of the accident. Approximately 50 percent of the 80 barrels of flammable solid toxic waste on the case truck burned in the postcrash fire.

The case truckdriver had 20 years experience operating articulated combination units. Prior to his employment with Kisko Transportation Inc., the driver worked for Mobil Oil Corporation for 10 years as a local delivery driver. The truckdriver began working for Kisko Transportation on June 29, 1988. The accident trip was the first time the driver had been away from home on an overnight trip. The driver's wife stated that he was terminated from Mobil Oil Corporation for absenteeism about 2 months prior to this accident. She indicated the underlying reason for her husband's absenteeism was his health condition. The driver's wife provided medical records which showed that her husband was being treated for severe peptic disease of the esophagus. The driver's physician also stated that the driver was suffering from depression over losing his other job and as a result of the illness. Records furnished by Mobil Oil Corporation showed that the driver had a current medical certificate. Kisko Transportation did not have a copy of this certificate in their files. The case truckdriver's log books burned in the postcrash fire and his hours of service were not determined.

The contract provisions between the State of Tennessee and the contractor, Allied Striping Inc., did not require the 65 mph speed limit to be reduced during pavement striping operations. The contract required the contractor to refer to the Manual for Uniform Traffic Control Devices (UMTCD) section 6B-4 and 6E-7. The contractor was not in compliance with section 6-E7 in that the arrow boards were not preceded by signs, barricades, or other

devices that warned of a lane closure ahead. Additionally, section 6E-8 of the MUTCD states, "Generally arrow panels should not be used for shoulder or roadside work activities nor should they be used on two lane highways because the panels can cause unnecessary lane changing."

An analysis of the bulbs from the flashing arrow boards showed that they were flashing at the time of the impact. The extensive fire damage to the case truck precluded an extensive post crash inspection. A visual examination did not reveal any obvious defects.

Allied Striping Inc., of Warrenton, Virginia, did not have a driver qualification file on the driver of the pavement striping truck. A background investigation showed that this driver was licensed in Delaware, Virginia, and Tennessee. His license in all three states was suspended as a result of a DWI conviction. This driver also had one previous accident while operating a pavement striping truck in Tennessee on May 7, 1987.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.016 percent alcohol and a 34 percent saturation of carbon monoxide. This sample was taken from the driver's descending aorta. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested for alcohol only at the request of the State of Tennessee. This analysis indicated that the blood sample contained 0.05 percent alcohol. However, it was noted by the State's Medical Examiner that the CHT test of the aorta blood was more representative of the driver's BAC.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Mack driver due to fatigue and his existing medical condition.

CASE: 104

Investigation No.: SEA-88-H-TR15
Accident Location: Route 99E, 1 mile south of Vina, California
Lanes: 2 lanes, undivided
Shoulders: Right, 4.5 - 7 feet, asphalt
Left, 4 - 5 feet, asphalt
Median: None
Features: At grade
Date and Time: July 7, 1988, 4:50 p.m.
Ambient Conditions: Daylight, sunny, clear
Heavy Truck Involved: 1986 Peterbilt conventional 3-axle tanker truck in combination with a 2-axle tank trailer
Motor Carrier: Wickland Oil Company
Type of Operation: Common Carrier
Size of Operation: 19 power units
Total Weight of Truck: 80,000 pounds
Total Length of Truck: 63 feet
Other Vehicle Involved: 1979 Ford Pickup and 1969 Chevrolet
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 1 **Other Injuries:** 6

FACTUAL SUMMARY:

This accident occurred as the 1979 Ford pickup was traveling south on California 99E. A 1969 Chevrolet Nova, followed by a 1986 Peterbilt tanker truck pulling a 1985 Clough trailer, were traveling north on California 99E. For an unknown reason, the pickup crossed into the southbound lane and the left front of the pickup struck the left front of the Nova. The Nova rotated and came to rest off the east side of the roadway facing southwest. The pickup rotated and crossed completely into the northbound lane. The driver of the pickup applied his brakes, skidded, and was steering to the right when it impacted the Peterbilt combination. A fire erupted immediately upon impact and the pickup was broken into two main pieces, the bed and the cab portion. The bed went in a northbound direction and came to rest in the northbound lane facing north. The Peterbilt truck and it trailer travelled off the east side of the roadway, in contact with the cab of the pickup. The heavy truck rolled onto its left side, but the trailer remained upright. The Peterbilt's cab burned completely. According to witnesses, an explosive fire erupted immediately upon impact.

Due to the extensive damage of the Ford pickup, all systems could not be thoroughly examined. An examination was conducted by members of the California Highway Patrol Multi-disciplinary Accident Investigation team (MAIT). They found the right front tire had burned, but the wheel was undamaged. The left front wheel had severe impact damage and the tire was missing from the wheel. The left rear tire was cut and deflated. The right rear tire was still inflated. Complete operational tests of the steering and braking were not possible due to collision and fire damage.

Vina, California
Case No. 104

The Chevrolet Nova sustained heavy damage along the left side from the front bumper to the area near the rear of the left wheel well. Both left tires were found to be deflated. The roof was severely buckled, the hood displaced, and the windshield broken.

The front of the Peterbilt sustained severe damage to the front end and the cab was completely consumed by fire. A 4X6 inch rectangularly shaped hole was found protruding outward on the upper right front of the cargo tank. (The hole was located behind the exhaust stack at the approximate height of the top of the heat shield.) An indepth mechanical inspection was conducted on the tanker truck by MAIT personnel. They found the push rod travel from the front axle brakes to measure 2 1/4 inches (the maximum allowable stroke is 1 3/4 inches). The only damage to the trailer was the broken "eye" in the drawbar [that hooks onto the pintle hook on the tanker truck] and a broken air hose in the vicinity of the drawbar. The MAIT investigation report noted that no defects were found in the combination which would have caused or contributed to this accident.

The tanker truck and trailer were hauling a combined liquid load of 7,341 gallons of diesel fuel. Both units were placarded with UN Number 1203 (for gasoline). The correct UN Number for diesel fuel is 1993. Under federal law, it is permissible to placard for gasoline when hauling diesel fuel.

The Ford and Peterbilt were occupied by only their drivers, both whom sustained fatal injuries. The Nova was occupied by the driver and five other occupants. The pickup driver sustained burns, internal, and head injuries, and was pronounced dead at the scene. The driver of the Nova and the left rear passenger both sustained serious injuries. The other 4 passengers sustained minor injuries.

The truckdriver sustained fatal burns and was pronounced dead at the scene. The truck was equipped with a seatbelt, but no determination was made as to whether it was worn.

The tanker truckdriver was an employee of Wickland Oil Company in Sacramento, California. He was hired in May of 1985. He had worked as a mechanic and truckdriver at Wickland and had a total of 4 years experience in this vehicle configuration. Although he had tanker truck experience when he started at Wickland, he was given an extra 10 days driver training, mostly for route and procedural reasons. The driver was rated as "Exceeds Standards of Job" in all categories in his most recent annual employee performance appraisal.

A record check with the State of California revealed that the truckdriver held a Class 1 license and had no violations or accidents in the past 3 years. A 50-state check revealed that he held only a California license and a National Drivers Register check revealed no revocations or suspensions.

The 17 year old driver of the Ford pickup held a valid California Class 3 drivers license which was issued to him on August 31, 1987. His record revealed no other violations or accidents in this 10 month period of time.

Vina, California
Case No. 104

The Nova driver was 54 years of age and did not have a drivers license, but was issued an official identification card by the California Department of Motor Vehicles in 1982. He had no recorded traffic violations or accidents.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 4,100 ng/ml of caffeine and a 13 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests of the truckdriver's blood were not conducted by the State of California; all available samples were released to the NTSB.

Blood, urine, and vitreous samples from the Ford pickup driver were also sent to the CHT for testing according to the NTSB protocol. CHT determined that the urine sample contained 0.05 percent alcohol and the vitreous sample contained 0.06 percent alcohol. No alcohol was found in the blood sample; however, CHT noted that due to the head space in the tube resulting from the small sample, the alcohol may have dissipated.

Blood samples from the passenger car driver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Ford pickup driver due to alcohol.

CASE NO.: 105

Investigation No.: ATL-88-H-TR15
Accident Location: U. S. 13, 1/2 mile north of Ahoskie, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Asphalt/Grassed, 8-feet-wide
Median: None
Features: Level, tangent, at grade
Date and Time: July 11, 1988, 7:20 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1978 COE International Harvester tractor in combination with a loaded flatbed trailer
Motor Carrier: B & B Lines, Inc.
Type of Operation: Common Carrier
Size of Operation: 8 power units, 1 straight truck
Total Weight of Truck: 74,920 pounds
Total Length of Truck: 53 feet
Other Vehicles Involved: (1) 1975 4-door Buick,
(2) 1980, Ford Mustang
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 2

FACTUAL SUMMARY

The northbound combination unit was traversing a tangent, level highway in a rural residential area as it approached a "T" intersection with a private east-west graveled road. Simultaneously, the Ford Mustang was southbound on the highway, and the Buick was eastbound on the graveled road. The Buick failed to stop at the highway and moved straight ahead onto the highway pavement and into the paths of the truck and Mustang. The Buick was struck on the right side by the truck. Following the impact, the Buick continued forward, veered left, crossed the right shoulder and ditch, struck a tree on the bank of the ditch, and came to rest on its right side. As the combination unit continued forward, it angled right from the pavement. Still coupled to the trailer, the tractor left the pavement. It crossed the right shoulder and over a culverted driveway. At that point the left front wheel of the tractor moved into the open ditch. The unit tilted left and rotated 180° clockwise on its longitudinal axis. With the unit overturning, the oriented strand board load shifted left and broke loose from its strapped trailer securement. The load spilled onto the roadway and the overturned unit skidded northerly. The rear of the moving trailer grazed the left front of the Mustang. Two trees were uprooted on the ditch bank as the overturned, and still coupled unit, came to rest. From initial impact, to its rest location, the unit traveled about 135 feet. The Mustang driver maintained control of the automobile. He continued forward after contact with the unit and parked his car on the west shoulder.

There was no evidence of precrash braking, or other evasive maneuver, by either the Buick or the truck. Postcrash inspection of the Buick revealed that the brake lining on two of its wheels were worn to the metal; no significant braking was possible. A similar inspection of the truck revealed that its brakes had been in recent operation and should have activated if they

Ahoskie, North Carolina
Case No. 105

had been applied. The truckdriver could have first sighted the Buick when the truck was about 200 feet from the intersection. The Mustang driver advised that he was traveling an estimated speed of 40 mph when his car was grazed by the trailer. He further estimated that the truck was traveling between 60 and 65 mph and the Buick about 45 mph when they collided.

Each of the three vehicles was solely occupied. The Buick was destroyed by crush damage and its unrestrained, and unlicensed, driver received serious injuries. The Mustang sustained only minor damage; its driver received minor injuries. The tractor cab was destroyed. Its roof was crushed downward to the top of the dashboard and the sleeper berth mattress. The unrestrained truckdriver was thrown from his seat and trapped inside the tractor cab with its weight resting on his body; he was dead at the site. The truckdriver's wife advised that he had an alcohol problem in 1986 and was confined at a State alcohol rehabilitation facility for five weeks. To her knowledge, he had drank no alcoholic beverage, nor had she suspected him of drinking any, since that time. A State Medical Examiner's report indicated that the driver's death was caused by "Asphyxiation by Chest Compression."

The 40-year-old truckdriver had no formal truckdriver training. He had driven heavy commercial trucks for about 15 years and had been employed by the motor carrier for about 1 1/2 years. He held a valid unrestricted Class A North Carolina drivers license. His previous seven year driving record revealed one traffic violation conviction and no accidents. Except for the required medical examination, the motor carrier had not qualified the truckdriver as required by Part 391 of the Federal Motor Carrier Safety Regulations (FMCSR). Neither did the carrier maintain the inspection and maintenance records on the truck required by FMCSR Part 396. He went on duty about 10:30 p.m. the previous night and was in violation of the FMCSR Hours of Service Regulation Part 395.3 (a) (2). He had been on duty 17 hours following 8 consecutive hours off duty.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.09 percent alcohol and 4,400 ng/ml caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina. This analysis indicated that the blood sample contained 0.13 percent alcohol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the Buick driver, for unknown reasons, to stop and yield the right-of-way to through traffic before entering the highway from a private road. Contributing to the accident was the impairment of the truckdriver due to alcohol use and fatigue. Contributing to the accident severity was the inadequate cab structure of the power unit.

CASE NO.: 106

Investigation No.: DEN-88-H-TR15
Accident Location: Interstate 5, 15 miles southwest of Mendota, California
Lanes: 4-lanes, divided
Shoulders: Right, 13-foot asphalt; left, 5-foot asphalt
Median: 75-foot earthen
Features: At grade
Date and Time: July 11, 1988, 10:30 p.m.
Ambient Conditions: Clear, dark, dry
Heavy Truck Involved: 1978 Freightliner in combination with a loaded trailer
Motor Carrier: Richard Allen Casparian
Type of Operation: Common Carrier
Size of Operation: 2 power units
Total Weight of Truck: 78,680 pounds (approximate)
Total Length of Truck: 65 feet (approximate)
Other Vehicle Involved: 1977 Freightliner in combination with 2 loaded 28-foot flatbed dump trailers

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

A 1978 Freightliner, in combination with a loaded 42-foot refrigerator trailer was northbound in the right lane of Interstate 5, 15 miles southwest of Mendota, California. The combination was following a 1977 Freightliner which was towing 2 loaded 28-foot flatbed dump trailers. Witnesses related that the 1978 Freightliner had followed the preceding combination for at least the time necessary for one witness to complete a pass of both vehicles. Interstate 5, in the accident area, was straight and level. Both vehicles were traveling in the right hand lane. The driver of the 1977 Freightliner stated that his tractor started to lose power and he turned on his flashers. Moments later his vehicle was struck from behind. The point of impact was located four feet five inches east of the center line in the right traffic lane. After impact, the 1978 Freightliner combination left 270 feet of skid, gouge, and scrape marks in a northwesterly direction to the west edge of the paved shoulder and 27 feet of gouge marks in the median to where it came to rest with the tractor on its left side facing northeast and the trailer on its right side facing southwest, resting on top of the tractor. The 1978 Freightliner combination was destroyed by fire. After impact, the driver of the 1977 Freightliner pulled the unit over onto the east shoulder, north of the accident site, and parked. Witnesses estimated the speed of the 1978 Freightliner at 55 to 61 mph at the time of the accident and confirmed that the taillights of the rear trailer of preceding were working.

The remains of the driver were found in the burned-out debris of the 1978 Freightliner; the driver of the preceding Freightliner was not injured. It could not be determined if the driver of the 1978 Freightliner was wearing any restraint system at the time of the accident. The driver of the 1977 Freightliner stated he was wearing a lap belt at the time. The 1978

Mendota, California
Case No. 106

Freightliner combination and its cargo were destroyed by fire. The tractor and first trailer of the 1977 Freightliner combination were not damaged; the second trailer received heavy damage and the load of tomatoes spilled onto the roadway.

The investigation revealed that the driver of the 1978 Freightliner had 19 years of truckdriving experience. He had been employed by the carrier for 10 months before the accident. A driver's license check revealed that the driver had valid licenses in the states of California and Pennsylvania, and expired license in the state of Ohio, and had surrendered his Illinois driver's license to the state of California. There was no record of traffic convictions or accidents in the past three years. The carrier maintained no driver's file as required by the state of California PUC laws.

The investigation further revealed that this driver left Stockton, California, at 6:30 a.m. on the day of the accident. He drove 250 miles to Andrews Distribution Company in Bakersfield, California. He remained in this area until the truck was loaded, leaving at 5:30 p.m. He then drove 50 miles to the Buttonwillow truck stop where he stayed for about three hours, departing around 9 p.m. He then drove the remaining 100 miles to where the accident occurred. The driver had driven 13.5 hours total on July 9 and July 1010, and 8 hours on July 11. The driving times and miles are estimated and based on the best information available.

Blood samples from the 1978 Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,000 ng/ml of caffeine and a 25 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the 1978 Freightliner were also tested at the request of the State of California. This test indicated that the blood sample contained a 40 percent saturation of carbon monoxide.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the 1978 Freightliner due to fatigue. Contributing to the accident was the sudden slowing of the leading vehicle.

CASE NO.: 107

Investigation No.: ATL-88-H-TR16
Accident Location: County Road 54, 7.5 miles west of Irwinton, Georgia
Lanes: 2, asphalt, each 8 feet wide
Shoulders: Grass; 4-5 feet side
Median: None
Features: At grade, left curve
Date and Time: July 11, 1988, 8:40 p.m.
Ambient Conditions: Dusk, cloudy, and wet surface
Heavy Truck Involved: 1986 Freightliner tractor in combination with a tanker trailer
Motor Carrier: Coastal Gulf Oil, Inc.
Type of Operation: Private Carrier
Size of Operation: 3 power units
Total Weight of Truck: 73,060 pounds
Total Length of Truck: 58 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit traveled south on County Road 54 and entered an eight-degree, 860-foot long left curve. The 9,200-gallon capacity tank trailer contained 7,502 gallons of diesel fuel. About 475 feet into the curve, the vehicle began to move onto the right shoulder of the roadway. As it continued farther through the left curvature, the vehicle gradually moved farther rightward onto the shoulder. After traveling on the shoulder about 221 feet, the right side of the vehicle entered the outer shoulder and lower embankment, and it began to overturn rightward onto the embankment. The overturning vehicle traversed a private drive, struck a utility pole 23 feet off the roadway, and struck a large tree 61 feet off the roadway. It came to rest on its left side facing south-southeast, about 130 feet from where the overturn started. Tiremarks from the left tractor tires, found near the right edge of the right traffic lane before the overturn, tended to follow the curvature of the highway.

Damage to the tractor included a demolished grill, right front fender, hood, and top of cab. The cab was crushed downward and rearward to below the bottom of the windshield, and the steering column was crushed onto the front seat cushion. The occupant space of the cab was destroyed. The unbelted driver was ejected onto the ground. Both sides and the top of the cargo tank sustained crush damage. There was some penetration of the tank. Ultimately, all the fuel spilled onto the ground. The utility pole was broken, and high voltage wires fell across the accident site, and emergency medical services were delayed approximately 1-1 1/2 hours. The truckdriver died at the accident scene.

A State Medical Examiner determined that the cause of death of the truckdriver was "Myocardial Infarction." In the autopsy, he found evidence of coronary artery disease. He found crash induced injuries that included

Irwinton, Georgia
Case No. 107

multiple fractures with hemorrhage into the left hemothorax. The Medical Examiner stated to a Safety Board Investigator that under the circumstances the crash induced injuries probably would have caused death, but he affirmed that the cause of death was a myocardial infarction that preceded the crash injuries.

The truckdriver had about 26 years experience in heavy trucks, five years with his current employer. Training by the former employer could not be documented. The current employer had provided no formal training. The truckdriver had a valid Georgia Class 5 driver license with no restriction. He had no recorded traffic conviction or accident in the last five years. There was no evidence of fatigue of the truckdriver, and he was in compliance with hours-of-service regulations.

The driver qualification file, as described by the motor carrier, contained a current DOT report of physical examination and certification. It did not contain other required documents; therefore, the motor carrier was not maintaining the driver qualification file for the truckdriver in accordance with Federal Motor Carrier Safety Regulations (FMCSR). The current DOT physical showed no history of cardiovascular disease, and the examining physician found no heart problems or other health problems. He noted under comments that the truckdriver was in good health. According to several family members, the truckdriver had no history of heart disease or any related type of problems. He was not taking any prescribed medication.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 108

Investigation No.: CHI-88-H-TR16
Accident Location: State Highway 14 at intersection with State Highway 54, near Covington, Tennessee
Lanes: 2, undivided
Shoulders: Right 8.4 feet, left 11.6 feet, both asphalt
Median: None
Features: "T" intersection
Date and Time: July 14, 1988, 9:50 a.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1977 White Freightliner tractor in combination with a loaded van trailer
Motor Carrier: Alton Lee Hawthorne
Type of Operation: Common Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 70,770 pounds
Total Length of Truck: 55 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination vehicle was traveling north on State Highway 14, with the refrigerated trailer loaded with beef. At the "T" intersection of State Highway 54 and State Highway 14 the driver failed to stop his vehicle at a stop sign and attempted to turn right from northbound 14 onto eastbound 54. The combination vehicle left side tires made loading type tire marks on the level pavement. These marks extended from the point where the truck passed the stop sign, and curved northeast with a radius of approximately 108 feet, to the north edge of the eastbound segment of Route 54. The trailer rolled onto its left side and down the roadside slope toward a small pond of water. The trailer was torn open and the cargo spilled during this rollover. The tractor was pulled into the rollover, and the cab was crushed as it struck the slope while overturning. The trailer came to rest on its right side, heading southeast, partially in the pond. The tractor came to rest on its wheels, detached from the trailer, facing southeast beside the pond.

The driver was ejected and seriously injured during the rollover. He was found semiconscious, east of the tractor, but died at the scene. No autopsy was conducted on the driver; the county coroner stated that no autopsy was conducted because the driver was found alive after the accident, so that showed he had no heart attack. According to the coroner the driver died at 10:20 to 10:30 a.m.

This driver had no formal training to operate heavy vehicles. He had between ten and fifteen years of heavy truck driving experience.

Covington, Tennessee
Case No. 108

According to his wife, this driver left home sometime on Monday and drove to Avilla, Arkansas, where he picked up a load. He left Avilla, Arkansas, traveling to Monterey, Tennessee. On July 13, 1988, the driver delivered the load and was on his way back to Avilla, Arkansas, for a second load, when his truck broke down. The driver called his wife and the shipper of the meat (Kruse Meats) to have his next scheduled pickup and delivery postponed a day.

The delivery date of the load was postponed until July 15, 1988. The driver made repairs to his truck and arrived at Kruse Meats sometime during the morning of July 14, 1988, to pick up the already loaded trailer. After picking up this trailer, he left Avilla, Arkansas, to deliver the load in Monterey, Tennessee, a total of approximately 458 miles east. After driving approximately 170 miles east, he driver was involved in the accident at 0945 hours.

Two conflicting sets of log book pages for July 1988 were found in the tractor cab. A fuel receipt found in the tractor cab was dated July 13, 1988, for a purchase of diesel fuel in Mason, Tennessee. One of the log books placed the driver in Arkansas all day on July 13, 1988. The other log book showed the driver first in Monterey, Tennessee, and then west in Fairview, Tennessee, at 0530 hours on July 13, 1988, approximately 150 miles east of the location where the gasoline was purchased. A receipt dated July 13, 1988, from a truck stop in Fairview, Tennessee, for the purchase of a used tire and a tire valve stem was also found in the cab of this tractor. Other fuel receipts found in the cab were for fuel purchases in Benton, Arkansas, for the refrigerated trailer tank and the tractor tanks.

Drugs found in the cab of the tractor included Percogesic decongestant, Rollaids, and Simethicone gas relief pills. The driver's wife related to investigators that he habitually fell asleep while watching television and often complained of feeling tired.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 610 ng/ml of psuedoephedrine and 1,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee. This screening test indicated that the blood sample contained an unquantified amount of psuedoephedrine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Freightliner driver due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 109

Investigation No.: DEN-88-H-TR16
Accident Location: Clear Creek Road, Redding, California
Lanes: 2 lanes, undivided
Shoulders: Gravel, 3-foot right shoulder, 4-foot left shoulder
Median: None
Features: Straight and level
Date and Time: July 13, 1988, 6:15 p.m.
Ambient Conditions: Clear, calm, daylight, temperature 95°F
Heavy Truck Involved: Partially loaded 1969 International 15-foot refuse truck
Motor Carrier: Shasta Bluff Disposal
Type of Operation: Private Carrier
Size of Operation: 7 power units
Total Weight of Truck: 8,900 pounds
Total Length of Truck: 15 feet
Other Vehicle Involved: 1966 Mack
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The 1969 International truck, hauling an eight cubic yard metal refuse container, was westbound on Clear Creek Road. The driver had just completed his shift of picking up refuse in the residential area east of Redding, California, and was enroute back to the company's headquarters. He was about three miles from his destination when his truck crossed over into the opposite traffic lane and collided with an eastbound logging truck. The logging truck was not carrying any logs, and was carrying its log trailer on top of the tractor in the piggyback position. The logging truck driver applied his brakes, locked up his wheels, skidded 134 feet, and steered towards the right shoulder before the two trucks collided. There were no tire skid marks from the refuse truck. The refuse truck struck the left front corner and left side of the logging truck. During the impact, the cab of the refuse truck was separated from the frame and the driver was ejected. The piggyback log trailer was dislodged from its position. The logging truck came to rest along the south side of the roadway facing north. The refuse truck came to rest along the south side of the road facing east. The log trailer came to rest at the rear of the logging truck facing west. The refuse truck cab and its driver came to rest under the logging truck's right side rear dual wheels.

The driver of the refuse truck died at the scene. The coroner listed the official cause of death as "Multiple severe traumatic injuries, due to blunt forces." The logging truckdriver received moderate injuries and was taken to a local hospital for treatment. There were no seat belts in either truck. Both trucks and the log trailer were destroyed.

A postcrash inspection of both tractors, performed jointly by the investigating police agency and NTSB, revealed no evidence of preaccident failure or deficiencies.

Redding, California
Case No. 109

An investigation into the fatally injured driver's employment history revealed that he was hired by his present employer in March 1987. He had no prior truckdriving experience and received no truckdriving training from his employer. Driving records revealed the driver had a valid California Class 3 license with 3 pending traffic violations, 7 traffic violation convictions, and 3 accidents in the last 3 years. The pending traffic violations were for speeding (2) and driving while intoxicated (DWI) with a scheduled court date of July 21, 1988. The 7 traffic convictions included; driving left of double yellow center lines, no drivers license, passenger unlawful riding on part of vehicle not intended for passenger, speeding (2), red light violation-accident involved, and DWI-accident involved. Additionally, the driver was arrested in August 1987 for possession of a controlled substance; that charge was subsequently dismissed at a later date. The National Drivers Register (NDR) had no listing on the driver.

The investigation revealed that in the 24 hours prior to the accident the driver worked 20 hours collecting refuse with a 3 hour sleep period which ended 9 hours before the accident. A friend of the driver stated that the driver was working many overtime hours at the disposal company and was taking amphetamine to keep himself going. During the 4 1/2 days prior to the accident, only 20 hours of sleep could be documented.

The company began operations in 1983 and was not regulated by either the California Public Utilities Commission or the Interstate Commerce Commission. The investigation revealed a high breakdown rate for the company's trucks. Also, the company was behind in their scheduled pickup of residential refuse which generated numerous customer calls and complaints.

Blood samples from the fatally injured driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 160 ng/ml of methamphetamine, 110 ng/ml of amphetamine, and 120 ng/ml of ephedrine. No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for THC (marijuana).

Blood samples from the driver were tested for alcohol only at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the International driver due to fatigue and his use of multiple drugs; methamphetamine and/or amphetamine and ephedrine.

CASE NO.: 110

Investigation No.: FTW-88-H-TR09
Accident Location: An unnamed dirt road on the Elk Hills Naval Petroleum Reserves of California approximately 8 miles north of Taft, California.
Lanes: 1 lane, undivided
Shoulders: Right side: None
Left Side: None
Median: None
Features: Winding curves in mountainous area
Date and Time: July 20, 1988, 9:10 p.m.
Ambient Conditions: Clear, dry, dark
Heavy Truck Involved: Conventional 1980 International 3-axle tractor in combination with a loaded vacuum tanker trailer
Motor carrier: Cummings Vacuum Service, Inc.
Type of Operation: Contract Carrier
Size of Operation: 29 power units
Total Weight of Truck: 79,000 pounds
Total Length of Truck: 60 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 0

FACTUAL SUMMARY:

At approximately 9:10 p.m. on July 20, 1988, the tanker combination was enroute to well #373 on the Elk Hills Naval Petroleum Reserves of California (NPRC), a U.S. Government Property managed by the Department of Energy and operated by Bechtel Petroleum Operations, Inc.(BPOI). The 5,280 gallon capacity tanker was carrying approximately 4,400 gallons of water to an oil drilling rig. According to witnesses, the driver made a left turn onto an unnamed dirt road, travelled about 100 feet, and stopped, realizing he had made a wrong turn. It was dark at this time and when the driver began backing, he allowed the right side tractor drive axle tires to travel over an approximate 7-inch high dirt lip that marked the roadway boundary. At this point the combination unit tipped over the embankment and fell approximately 7 feet, coming to rest inverted. Witnesses stated that the driver was backing at less than 5 mph when the accident occurred.

When the combination unit overturned, the tractor cab was extensively crushed--there was only 19-22 inches of space remaining between the roof and the driver's seat cushion. The unrestrained driver was partially ejected, receiving fatal injuries when his upper torso was crushed between the dashboard and the ground.

Rescuer's stated that when the tractor overturned, the air ride seat extended all the way out, and they had to release the air pressure in order to extricate the driver from the wreckage.

Taft, California
Case No. 110

A postcrash inspection of the tractor disclosed that the latchplate and its webbing had been removed, and the only remaining seatbelt hardware was the buckle and its webbing. A safety inspection performed on the combination unit by the California Highway Patrol on the day of the accident showed the following: on the tractor the high beam head lamps were inoperative, there was a gussett broken on the right side of the front crossmember, and one spring hangar bolt was loose. On the trailer, the fifth wheel plate bolts were loose, the forward axle brakes were out of adjustment, and the right front spring U-bolts were loose.

An examination of the operating policies on the NPRC showed that both the operator BPOI and the motor carrier, Cummings Vacuum Service, Inc. required drivers to wear their seatbelts when operating a vehicle on the reserve. However, Cummings Vacuum Service was unaware that the accident truck was not properly equipped with seatbelts. The NPRC had many narrow, winding roads, and employees drove large trucks in areas that were not lighted. There were no provisions in the operating policies at this facility to require a ground guide during backing maneuvers.

The 46-year-old driver had been operating heavy trucks for approximately 10 years, but had only been employed for this motor carrier for 6 days. A search of his driving history showed that he had been convicted of one traffic violation and had been involved in one other traffic accident in the preceding 3 years. It was discovered that, in addition to his California license, the driver had an expired Wyoming license and a valid Texas license.

During interviews with the driver's wife, it was learned that the driver had sustained a compressed vertebra during a horse riding accident about 10 years earlier. She stated that he experienced frequent pain from this old injury and it caused him to sleep poorly. The investigation found that the driver had been working long hours, with 2 day shifts and 2 night shifts in the 6 days he had been employed by the carrier.

When the truckdriver took his examination for his medical certificate with a previous employer in January of 1988, he indicated on the exam form that he was taking Darvon-65. He passed that pre-employment drug screen, and he passed a pre-employment drug screen with his present employer that was administered on July 11, 1988.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,700 ng/ml of psuedoephedrine and 500 ng/ml of phenylpropanolamine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 3,000 ng/ml of ephedrine, 840 ng/ml of phenylpropanolamine, 790 ng/ml of methocarbomol, and 250 ng/ml of diphenhydromine.

Taft, California
Case No. 110

The methocarbamol reported by the California laboratory is below the testing cut-off used by the Center for Human Toxicology according to the NTSB protocol. However, the differences in the other drugs reported by the two laboratories cannot be resolved analytically, even though the identification of ephedrine versus psuedoephedrine is an analytical problem. In addition, the absence of diphenhydramine in the CHT specimen/results could not be explained.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the driver's fatigued condition was his use of multiple drugs. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 111

Investigation No.: NYC-88-H-TR14
Accident Location: Interstate 95, Halethorpe, Maryland
Lanes: Eight lanes
Shoulders: Right, 10 feet 9 inches; Left shoulder, 10 feet, both asphalt paved
Median: 38 feet, grass
Features: At grade, 681-foot radius right curve

Date and Time: July 25, 1988, 2:50 a.m.
Ambient Conditions: Clear, 78°F and dry
Heavy Truck Involved: 1977 Mack COE tractor in combination with a loaded flatbed trailer

Motor Carrier: Mad Dog Transport
Type of Operation: Common Carrier
Size of Operation: 4 power units
Total Weight of Truck: 71,312 pounds
Total Length of Truck: 51 feet
Other Vehicle Involved: None
Truck Fatalities: 2
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 0

FACTUAL SUMMARY:

The Mack tractor and flatbed trailer loaded with steel "I" beams was northbound in the third lane of Interstate 95 in Halethorpe, Maryland. As the truck approached the Metropolitan Avenue overpass, it suddenly veered leftward, crashed into a blocked out "W-beam" median guardrail, and overturned 180°. Following the collision a fire ensued that completely destroyed the tractor and the forward section of the flatbed trailer. A witness who was also traveling northbound on Interstate 95 stated that he observed what he thought was a blow-out of the truck's front tire, and the truck suddenly veered leftward. The witness estimated the Mack's speed at 55 mph.

During the crash both unrestrained occupants of the Mack were ejected and killed. Both occupants were discovered underneath the trailer and it could not be determined which occupant was operating the truck when the crash occurred. Both were drivers employed by the lease operator.

The speed limit for the highway was 55 mph, and an inspection of the highway revealed a gouge mark surrounded by hydraulic fluid in the third northbound lane, 410 feet south of the truck's first collision with the median guardrail. An inspection of the wreckage showed that the spindle connection at the gear box of the steering mechanism was worn; the spline of the steering shaft was separated from the spindle and was deformed and embedded with turf and dirt. Also, the Maryland State Trooper on the scene at the time of the crash stated that he observed what he believed were components of the steering mechanism in the third northbound lane near the gouge mark. These remnants, however, were removed from the accident site and were not examined by the Safety Board.

Halethorpe, Maryland
Case No. 111

There were no braking marks located at the accident site, and there were no marks that indicated a sudden steering maneuver by the Mack driver. Both drivers were reportedly familiar with the load and the vehicle, however, neither the Motor Carrier or the lease operator complied with Federal Motor Carrier Safety Regulations, by not maintaining driver records, logs or vehicle maintenance records. Neither truckdriver had received any training from either the lease operator or motor carrier and a complete account of either drivers experience could not be determined.

Blood samples from the occupants of the truck were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample from one occupant contained 130 ng/ml of benzoylecgonine and 1,400 ng/ml of caffeine. CHT determined that the second sample contained 3,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified in the blood samples.

Toxicological tests were not conducted by the State of Maryland.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the truck's steering mechanism. Contributing to the accident was the inadequate maintenance provided by the motor carrier.

CASE NO.: 112

Investigation No.: CHI-88-H-TR17
Accident Location: U. S. Route 64, Polk County, Tennessee
Lanes: 2-lane undivided highway
Shoulders: Varible width, 6 to 12.5 feet on right side; left side 4 feet wide
Median: None
Features: 4.3 percent upgrade, left curve (280 foot radius) on a mountainside; the traffic lanes have a +10.5 percent cross slope to the right
Date and Time: July 21, 1988, 5 a.m.
Ambient Conditions: Cloudy, dry, darkness, about 65°F
Heavy Truck Involved: 1983 Freightliner COE in combination with a loaded van trailer
Motor Carrier: Transportes Azteca
Type of Operation: Common carrier
Size of Operation: 22 power units
Total Weight of Truck: 73,640 pounds
Total Length of Truck: 58 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The Freightliner combination was traveling eastbound on U.S. Route 64 when it entered an uphill left curve as the roadway traveled along the mountainside above the Ocoee River. The combination failed to negotiate the left curve, and the unit's right side tires began to leave yawmarks in the right lane about 180 feet into the 558-foot curve. The yawmarks tracked from the right traffic lane onto the right shoulder, a distance of 253 feet where the unit turned over onto its right side impacting a "W-beam" guardrail. The combination continued over the guardrail and rolled 36 feet down an embankment before coming to rest on its roof in the Ocoee River.

The tractor and trailer were destroyed in the rollover and subsequent ejection of the trailer's load of 880 50-pound bags of safety absorbent. The lapbelted driver was fatally injured when the tractor's roof was crushed downward by the multiple impacts.

The truckdriver had been employed by the carrier approximately 10 days before the accident. He obtained his commercial vehicle operator's license in New York on March 31, 1988, but never received any training for commercial vehicle operation. His family related that he had driven trucks before and had about five years of truck driving experience. The two trucking companies listed on the driver's employment application were contacted. Anatasi Trucking in New York stated he was only used as a laborer, and Sagara Trucking in California stated that if he had worked for them it would have been through Morning Star Trucking which uses students from Davis University. He would have been employed about 10 weeks driving a combination vehicle hauling

tomatoes. The driver's personal resume, dated from 1979 to present, did not list truckdriving experience. A 50-state license check and a NDR check indicated the driver had a valid New York chauffeur's license and a valid California operator's license.

A postcrash inspection of the Freightliner combination vehicle found one battery disconnected on the tractor. The rest of the unit was in good repair with no other evidence of malfunction in the combination's systems or components. However, repair receipts supplied by the carrier show the tractor was in for mechanical and electrical repair service twice while on the accident trip.

The carrier had been in operation for approximately 33 years. The carrier's safety director stated that they had obtained all the required documentation and tests for the driver's qualification file, but the file was inadvertently given to the driver with the truck's authority packet. The qualification file was not recovered from the accident site and, consequently, the carrier did not have a file for the driver.

This was the driver's first trip for the carrier and he was not accustomed to nighttime activity. (His normal sleeping habits included approximately 9 hours of sleep per night plus naps during the daytime.) The trip had originated in Buffalo, New York, on July 14. The truckdriver was maintaining a record only of dates, routes, and miles travelled--no record of duty or driving time was made. It was determined that the driver had travelled over 3000 miles since departing New York, accumulating as many as 930 miles in one day. His destination, for this portion of the trip, was from Memphis, Tennessee to Charlotte, North Carolina. Both the carrier and truck owner were surprised at the accident location on U.S. Route 64, and questioned the driver's choice of U.S. Route 64 over I-40, a more direct route.

The road surface conditions at the accident site were clear and dry--all lane delineations were visible. It was still dark at the time of the accident (5 a.m.) according to the investigating trooper and the roadway is unlighted. The speed limit for U.S. Route 64 was posted at 45 mph; however, a left curve warning sign with a 30 mph advisory speed was placed 513 feet before the curve.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for THC (marijuana) or stimulants.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee with negative results.

Polk County, Tennessee
Case No. 112

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed for his vehicle and load on the mountainous roadway. Contributing to the accident was his impairment due to fatigue and his inexperience with heavy trucks. Contributing to the accident severity was the inadequate cab structure of the power unit.

CASE NO.: 113

Investigation No.: CHI-88-H-TR18
Accident Location: I-24, East Ridge, Tennessee
Lanes: 6-lane divided highway
Shoulders: Right, 10.7 feet, asphalt; left, no shoulder
Median: 15 foot 6 inches earthen, split by a "W-beam" guardrail
Features: Depressed with a 4 percent downgrade
Date and Time: July 23, 1988, 1:28 a.m.
Ambient Conditions: Clear, dry, darkness with street lights, 60°F
Heavy Truck Involved: 1983 Mack COE in combination with a loaded van trailer
Motor Carrier: Robinson Brothers Trucking
Type of Operation: Common Carrier
Size of Operation: 16 power units
Total Weight of Truck: 75,500 pounds
Total Length of Truck: 55 feet
Other Vehicle Involved: 1987 GMC tractor pulling two trailers
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

The Mack combination was traveling eastbound on I-24 in the right traffic lane when the tractor struck the back of the second trailer of a GMC doubles combination also eastbound on I-24. Following the collision, the Mack combination veered to the left, leaving 80 feet of skidmarks from the right traffic lane across the center lane and into the left traffic lane. The unit then veered to the right, traveling about 95 feet across the eastbound traffic lanes and onto the right shoulder. It continued across the shoulder and into the drainage ditch, overturned onto its left side, and impacted the embankment on the opposite side of the ditch.

During the off road rollover and collision sequence the Mack tractor's cab rotated rearward, the frame rails fractured, and the driver's compartment was crushed from back to front by the trailer. The driver was pinned in the wreckage, fatally injured.

A witness to the accident stated he was operating his truck eastbound on I-24 at approximately 62 mph when the Mack combination passed him traveling at about 65 mph. The witness stated that he was following behind the Mack combination when he observed the unit's brake lights activate momentarily then the unit turned over onto its right side. The Mack tractor's owner stated that his unit had a governed speed of 60 mph. Mack Trucks in Pennsylvania was contacted; they confirmed that the geared speed and governed speed of the accident tractor was 60 mph.

The Mack tractor and van trailer was destroyed in the collision. The trailer's load of bottled/cased beverage alcohol broke through the trailer's roof when the vehicle rolled over, and an undetermined amount of alcohol spilled from broken bottles. The emergency responders (police/fire) were

unsure of the load classification of the trailer as the unit was not placarded. It was later determined that the trailer's load of beverage alcohol was indeed a hazardous material cargo, but was excepted from placarding because it was packaged in containers of 110 gallons or less. A postcrash inspection of the Mack combination revealed the slack adjusters for the brakes on the steering axle were adjusted so the brakes would not activate during a full brake application. This was confirmed by the carrier's mechanic.

Information furnished by the carrier and the driver's family indicated that the driver had approximately eight months of heavy truck driving experience, six of which were ride-along training with his father or uncle. He had not received formal truckdriver training. The driver had approximately 3 months of experience in the accident vehicle. A 50 state search of his driving history revealed he was licensed in Illinois from April 30, 1985, to September 12, 1986, with a class A (8,000 pounds or less vehicle) driver's license. The Illinois license was surrendered to Indiana when he received his Indiana Chauffeur's license, which was valid with no recorded violations at the time of the accident. An NDR check on the driver was negative for any contacts.

The driver's log books, recovered at the accident site, indicatd that he began the 4-day trip on July 21, 1988, at about noon when he performed a pretrip inspection on his unit. The driver's parents stated that he began the trip about 10:30 p.m. If the driver's log book times are valid, he had worked for 19.5 hours before the accident with 1/2 and 1 hour breaks from duty. If the parents' statement was true, then the driver probably had only 6.5 hours off-duty, in 1/2 and 1 hour breaks, in the 33 hours preceding the accident.

The driver of the GMC combination received only minor injuries in the collision. The rear most trailer was substantially damaged in the collision when the fifth wheel connection broke away from the converter dolly and the trailer veered to the right running off the roadway into the drainage ditch and overturned onto its left side.

Blood samples from the Mack driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.03 percent alcohol and 200 ng/ml of ephedrine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Mack driver were also tested at the request of the State of Tennessee. This analysis indicated that the blood sample contained 0.04 percent alcohol and 500 ng/ml of phentermine, a prescription drug for weight loss/control. The driver's family physician, who also signed the medical examiner's certificate, checked his file concerning the drug found. The files did not list the drug phentermine. The physician could not determine where the driver obtained the drug. The city police report indicates the driver was impaired, noting the positive tests for alcohol and drugs. The investigating officers from the East Ridge Police Department also recovered some pills from the wreckage of the truck. The recovered pills were analyzed as methamphetamines and epherdrine.

East Ridge, Tennessee
Case No. 113

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was Mack driver's impairment due to fatigue and his use of drugs; alcohol and phentermine.

CASE NO.: 114

Investigation No.: ATL-88-H-TR17
Accident Location: Interstate 40, 13.3 miles west of Clyde, North Carolina
Lanes: Asphalt; 4 lanes, divided
Shoulders: Right, 10 feet; left, 1 feet asphalt
Median: Concrete median barrier
Features: Downgrade, left curve
Date and Time: July 26, 1988; 7:15 p.m.
Ambient Conditions: Clear and dry; daylight
Heavy Truck Involved: 1983 White tractor in combination with a flatbed trailer hauling wallboard
Motor Carrier: Olen Burrage Trucking, Inc.
Type of Operation: Common Carrier
Size of Operation: 330 power units
Total Weight of Truck: 69,000 pounds
Total Length of Truck: 59 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The combination unit was eastbound on Interstate 40 in the Great Smoky Mountains. About 0.1 mile beyond a crest, on a 1.3 percent descending grade 955-foot radius left curve, the vehicle swerved from the roadway onto the right shoulder. It continued across the shoulder and struck a "W-beam" metal guardrail. Engaging the guardrail as it swerved along the right shoulder, the vehicle subsequently overturned onto its right side. Still engaging the guardrail, the vehicle skidded forward on its right side for about 300 feet eastward from where it first impacted the guardrail. The tractor came to rest on its right side, against the guardrail, and the trailer came to rest on its top in the right traffic lane. A eastbound truckdriver followed the combination unit for a considerable distance before the accident. He said the combination unit was traveling about 45 mph and weaving across both traffic lanes. The witness opted to remain about four truck lengths back because he "knew that he (the combination unit) was going to wreck."

The tractor was substantially damaged. Primarily, the upper right portion of the cab was deformed downward and toward the left rear. Intrusion into the right portion of the cab was extensive, and the right side passenger area was destroyed. Damage to the trailer included some warping of the chassis and minor damage to attachments for the tandem axle assembly. The truckdriver was not using the available lap/shoulder belt. He was ejected onto the highway and fatally injured.

The 36-year-old truckdriver had over 15 years experience in heavy trucks; only about one month with the current motor carrier. His training included one month of professional truckdriver training in 1974. The truckdriver held a valid Mississippi commercial driver license with a restriction of

Clyde, North Carolina
Case No. 114

corrective lenses. His driver history revealed a conviction on September 3, 1985, for driving under the influence, for which his license was suspended until October 12, 1987. The suspension was also on record in the National Driver Register. No record was found of any other traffic conviction or accident for the truckdriver during the last three years.

The interstate motor carrier maintained a Driver Qualification File for the truckdriver in accordance with Federal Motor Carrier Safety Regulations (FMCSR). The file revealed no history of alcohol or drug abuse. At the time of the accident, the truckdriver was enroute from West Memphis, Arkansas, to Richmond, Virginia. There was no evidence of hours of service violations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.19 percent alcohol, 2 ng/ml of the psychoactive component of marijuana (THC), and 28 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were tested for alcohol only at the request of the State of North Carolina. This analysis indicated that the blood sample contained 0.10 percent alcohol.

Blood samples were obtained from the truckdriver during emergency medical treatment that included blood transfusions. Other toxicological samples were obtained during autopsy. On the earlier blood samples, the Mission Memorial Hospital reported a BAC of 0.16 percent, and the Center for Human Toxicology (CHT) reported a BAC of .17 percent.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to his use of alcohol and marijuana. Contributing to the injuries and death of the truckdriver was his failure to use the available lap/shoulder belt and the inadequate cab structure of the power unit.

CASE NO.: 115

Investigation No.: SEA-88-H-TR16
Accident Location: State Route 166, 4.7 miles east of Cuyama, California
Lanes: 2 lanes, undivided
Shoulders: Right, 1.2 feet; left, 1 feet, both asphalt
Median: None
Features: at grade, straight, 1 percent downgrade
Date and Time: July 27, 1988, 5:35 a.m.
Ambient Conditions: Clear, dark, dry, and 65°F
Heavy Truck Involved: 1973 Kenworth conventional tractor in combination with a loaded 44-foot lowboy trailer
Motor Carrier: Turman Construction Co., Inc.
Type of Operation: Private Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 53,600 pounds
Total Length of Truck: 61 feet
Other Vehicle Involved: 1966 Peterbilt COE in combination with two empty 20-foot trailers

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The 1973 Kenworth tractor and loaded lowboy trailer was traveling westbound down a 1 percent grade on State Route 166 at a witness estimated speed of 55 mph. A 1966 Peterbilt pulling two empty beet trailers was approaching the Kenworth from the west at a witness reported speed of at least 55 mph. A witness just ahead of the Kenworth reported that the second trailer behind the Peterbilt began to whip sideways, and eventually crossed the centerline and was struck by the front of the Kenworth tractor. After the collision, the Kenworth went off the north side of the road and came to rest upright about 197 feet past the point of impact. The rear trailer behind the Peterbilt was torn loose at impact and the tractor and first trailer were brought to a stop by the driver and parked on the south shoulder east of the impact area. The unrestrained driver of the Kenworth was found pinned in the driver's seat with fatal injuries. No injuries were received by the unrestrained driver of the Peterbilt.

The front of the Kenworth was damaged extensively, with the crushing being rearward and to the right. The bottom of the steering wheel rim was pushed into the back of the driver's seat. Most of the roof above the driver's position was also torn off during the collision. The lowboy trailer and the water truck being transported were not damaged. The Peterbilt tractor and first trailer received no damage, while the second trailer was destroyed.

The driver of the Peterbilt stated that the drawbar on the second trailer had been secured to the trailer with one long bolt, threaded on both ends. One end had right hand threads and the other left hand. This bolt had been installed on the trailer two days before the accident. The bolt had been placed through the eyes on the trailer and the drawbar and then fastened with

one nut on each end. The California Highway Patrol had inspected this trailer the day before the accident, and found the bolt and both nuts in place and tight. After the accident the bolt was found still in the right side eye of the rear trailer, with the nut missing from the left end, while the drawbar had separated from the second trailer and was still attached to the pintle hook on the first trailer. The threads on the left end of the bolt showed no signs of stripping, and the bolt itself had two distinct bends in it.

The driver of the Peterbilt stated that he felt no movement of any of his trailers prior to the impact, and that he was not watching the trailers in his mirrors. He said that the first indication he had that there was a problem was the noise he heard at impact.

The Kenworth's left side saddle tank was ruptured in the lower front section. This allowed the majority of the fuel to leak out, but no fire resulted.

The Kenworth driver possessed one valid California driver's license, had one violation in the past three years, and had been involved in no accidents over the same time span. His experience in heavy trucks was 38 years, and he had not received any formal training.

Blood samples from the Kenworth driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Kenworth driver were also tested at the request of the State of California. This screening test indicated the presence of caffeine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the sudden mechanical failure of the trailer towing mechanism.

CASE NO.: 116

Investigation No.: CHI-88-H-TR19
Accident Location: U.S. Highway 53, 1.4 miles south of W. Baldwin Avenue, Solon Springs, Wisconsin
Lanes: 2 lanes, undivided
Shoulders: 8 feet wide, 3 feet asphalt and 5 feet gravel
Median: None
Features: Straight roadway
Date and Time: July 27, 1988, 10:25 p.m.
Ambient Conditions: Clear
Heavy Truck Involved: Empty 1984 Ford flatbed truck
Motor Carrier: Jayco Enterprises d.b.a. Jet Inc.
Type of Operation: Common Carrier
Size of Operation: 34 power units
Total Weight of Truck: 13,000 pounds (estimated)
Total Length of Truck: 30 feet
Other Vehicle Involved: 1983 Freightliner tractor in combination with a loaded flatbed trailer

Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 1 **Other Injuries:** 1

FACTUAL SUMMARY:

The Ford straight truck was traveling south on an approximate 3 percent downgrade on a straight section of 2 lane roadway when it collided with a northbound Freightliner combination vehicle. The Freightliner driver stated that, as he was traveling north, he saw the lights of an oncoming vehicle enter his lane and he steered to the right to avoid a collision. The Ford struck the Freightliner head on, and the tractor of the combination unit jackknifed to the left. As the collision occurred, the cargo of the combination vehicle trailer broke free, struck, and penetrated the rear of the tractor cab.

Both vehicles were destroyed by this collision. The Ford cab was crushed rearward by the collision, pinning and fatally injuring the driver of that vehicle. The front axle of the Ford was separated from that vehicle and came to rest approximately sixty feet west of the final rest location of the vehicles. The truck bed and rack of the Ford were separated from that vehicle in the collision.

The impact of the flatbed cargo penetrated the rear of the Freightliner cab and tore it apart. The codriver of the Freightliner, seated in the right seat, was ejected and thrown north onto the northwest shoulder, landing approximately eighty feet from the final rest position of the Freightliner tractor. The codriver received fatal injuries. The Freightliner driver was ejected as that vehicle came to rest. This driver was seriously injured and hospitalized.

The cargo of the Freightliner's trailer was scattered north and west of the rest location of the vehicles in the southbound travel lane and shoulder. Gouging of the pavement surface, located near and at the centerline of the roadway and in the southbound travel lane, occurred during the collision.

Solon Springs, Wisconsin
Case No. 116

The Ford driver was hired by the motor carrier in January 1988. He claimed on his job application to have 3 years experience operating straight trucks. When hired he was given a ride-along student trip with the company safety director, and instruction in loading and unloading camper trailers from the company trucks. The driver had also ridden along and driven with his brother and father, also employed as drivers at this company, on a total of five trips. He had no other training.

The Ford driver had no log book pages completed for July 26 or 27, 1988. The last entry in the log book was marked at 2345 hours on the page for July 25, 1988.

The motor carrier of the Ford driver stated he had taken the accident involved truck from Middlebury, Indiana, to his home in Sturgis, Michigan, on July 25, 1988, at 1530 hours. He then left for Thunder Bay, Ontario, Canada, at 2030 hours and drove to Portage, Wisconsin. At Portage, Wisconsin, the driver bought fuel on July 25, 1988, at 1538 hours (according to company billing records), and made other purchases 4 hours later, on July 25, 1988, at 1932 hours, according to the cash register receipt found in his truck labeled "Petro Plaza, Portage, Wisconsin."

Mileage from Midddlebury, Indiana, to Portage, Wisconsin, is listed as 291 miles. Mileage from Portage, to Thunder Bay, Ontario, Canada, is listed as 477 miles. From Thunder Bay to Solon Springs, Wisconsin, the distance is listed as 219 miles.

The Freightliner vehicle was transporting cargo which had originated in Sao Paulo, Brazil. The truck cargo was containerized freight consisting of 2 box beam structures and a round steel shaft. The log books of the Freightliner driver and codriver were completed up to 2100 hours on July 27, 1988. These pages showed the Freightliner had left from Chicago, Illinois, at 1530 hours, and travelled to a rest stop on Interstate 94 where the surviving driver began operating the Freightliner at 2100 hours, after spending 5 hours in the sleeper berth, and a 0.5 hours break. The distance from Chicago, Illinois to the accident scene is approximately 436 miles.

Blood samples from the Freightliner driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as defined by the NTSB testing protocol, were identified.

Blood samples from the Ford driver were also sent to CHT for testing. CHT determined that the blood sample contained 1,600 ng/ml of caffeine. No other drugs were found.

Toxicological tests were not conducted by the State of Wisconsin.

Solon Springs, Wisconsin
Case No. 116

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure, for unknown reasons, of the Ford driver to maintain his vehicle within the proper lane. It is possible that the Ford driver was impaired by fatigue.

CASE NO.: 117

Investigation No.: ATL-88-N-TR18
Accident Location: U.S. 17, 10.6 miles north from Windsor, North Carolina
Lanes: 2 lane, undivided
Shoulders: Grassed, 8-feet-wide
Median: None
Features: Level, tangent, at grade
Date and Time: July, 27, 1988, 5:15 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: (A) Empty 1986 Ford van, 10,100 pounds GVWR
Motor Carrier: R. L. Jeffries Trucking Co., Inc.
Type of Operation: Common Carrier
Size of Operation: 221 power units
Total Weight of Truck: 6,000 pounds
Total Length of Truck: 22 feet
Heavy Truck Involved: (B) 1979 Freightliner COE tractor in combination with loaded 48-foot van trailer
Motor Carrier: Topco Enterprises, Inc.
Type of Operation: Contract Carrier
Size of Operation: 63 power units
Total Weight of Truck: 59,710 pounds
Total Length of Truck: 59 feet
Other Vehicle Involved: 1975 Chevrolet passenger car
Truck Fatalities: 2 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 7

FACTUAL SUMMARY:

The automobile, with 8 occupants, was stopped in the northbound roadway waiting for the approaching southbound combination unit to pass before turning left onto an intersecting paved road. The northbound van truck came up from behind the automobile and began skidding. It was veering left when the right front struck the left rear of the automobile. The impact forced the automobile to the right, off the highway, and caused it to overturn. The automobile came to rest on its top on a grassed area in the southeast corner of the intersection some 45 feet from the point of impact. The van truck driver lost control of his vehicle. It crossed the centerline, moved forward for a distance of 138 feet, and impacted the oncoming combination unit headon. Engaged, the two trucks moved southward. The tractor rotated counterclockwise about its fifth wheel coupling and the truck was directed rearward onto the southeast corner of the intersection. On the corner, the truck struck the at-rest automobile and came to its final position. The combination unit came to rest blocking both traffic lanes still coupled and upright. Both truckdrivers, traveling alone, were trapped inside their vehicle. The tractor's left fuel tank was ruptured, diesel fuel spilled onto the roadway, and fire erupted immediately about the tractor and truck cab. Roadway evidence indicated that both truckdrivers applied precrash braking. Tire marks on the northbound pavement indicated that the van truck was braking for a distance of about 46 feet prior to its initial impact with the automobile. Tire marks on the southbound pavement indicated that the combination unit was braking for a distance of about 48 feet in approach to the truck impact; both

Windsor, North Carolina
Case No. 117

vehicles traveled together a distance of approximately 107 feet to the location where they came to rest. The postcrash condition of the trucks prohibited a thorough inspection; however, other available physical evidence did not indicate that a precrash defect on either vehicle initiated the accident sequence. The lack of witnesses and physical evidence precluded a determination of the speed of the van truck. A southbound motorist estimated that the combination unit was traveling between 52 and 54 mph. The speed limit was 55 mph.

The automobile sustained severe crush damage at the left rear, left side, and roof; it was destroyed by the postcrash fire. Except for a one-month-old infant who was riding in a child safety seat, none of the occupants were restrained. The eight occupants exited the automobile prior to the fire; all but one received minor impact injuries. The truck and combination unit sustained severe front end crush damage; both were destroyed by fire. It was not determined whether the trapped truckdrivers were restrained; both died in the fire.

Autopsy reports revealed that the van driver's death was caused by "Blunt trauma to the head" and the combinationdriver's death was caused by "Thermal burn."

The 26-year-old van driver had been driving commercial trucks for only 3 months. He completed a truckdriver training course on April 16, 1988. Two weeks later he was employed by the motor carrier to drive vehicles in its drive-a-way service. He held valid unrestricted commercial drivers license from Indiana and Louisiana plus a operators license from Virginia. His previous three year driving record revealed one traffic violation conviction and no accidents. Part 383 of the Federal Motor Carrier Safety Regulations (FMCSR) prohibits commercial drivers who drive heavy trucks from holding more than one license; however, this regulation does not apply to drivers of small and medium sized vehicles. The motor carrier had qualified the driver and maintained a Driver Qualification File as required by Part 391 of the FMCSR. He was required to prepare daily driving logs but had not furnished them to the carrier for the previous 30 days. The motor carrier had no time record of the driver's activity; no hours of service data was available. At the time of time of the accident he was driving the medium sized truck in a drive-a-way service from Jonesboro, Georgia (an Atlanta, GA suburb), to Newport News, Virginia, a distance of about 545 miles. He arrived in the Atlanta area about 5 a.m. on the previous day. He remained in Atlanta all day without sleep, then left between 6 p.m. and 12 midnight driving on the accident trip. He had been enroute on the trip for at least 29 hours and had driven about 500 miles.

The 31-year-old combination driver had no formal truckdriver training. He had no heavy truck driving experience prior to his employment by the motor carrier about 18 months earlier. He held a valid unrestricted Class A North Carolina drivers license. His previous three year driving record revealed one accident and two violations of speeding. The speeding violations resulted in a 2-month drivers license suspension. He continued driving and was subsequently charged with driving on a suspended license. That suspended

license charge was pending at the time of the accident. The motor carrier had qualified the driver and maintained a Driver Qualification File as required by the FMCSR. However, they were not requiring him to prepare daily logs. Reconstruction of his duty time indicated that the driver had been on duty approximately 41 1/4 hours during the preceding 8 days and had been driving about 2 3/4 hours at the time of the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,900 ng/ml of caffeine and a 26 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina. This test indicated that the blood sample contained a 25 percent saturation of carbon monoxide.

Urine samples from the van truck driver were also sent to CHT for testing. CHT determined that the urine sample contained 10,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for carbon monoxide.

Blood samples from the van truck driver were tested at the request of the State of North Carolina. This test indicated a 10 percent saturation of carbon monoxide.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the Ford van driver due to fatigue.

CASE NO.: 118

Investigation No.: DEN-88-H-TR17
Accident Location: Interstate 40, 2.6 miles east of Claremont, North Carolina
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left, 4 feet; both asphalt
Median: 25 foot wide grass
Features: Straight with slight downgrade
Date and Time: July 27, 1988, 4:33 p.m.
Ambient Conditions: Cloudy, windy, and torrential rains
Heavy Truck Involved: 1969 Mack in combination with a loaded 48-foot van trailer
Motor Carrier: Shelba D. Johnson Trucking Inc.
Type of Operation: Common Carrier
Size of Operation: 42 power units
Total Weight of Truck: 34,000 pounds
Total Length of Truck: 59 feet
Other Vehicle Involved: 2 passenger vehicles
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 3

FACTUAL SUMMARY:

The 1969 Mack tractor and 1978 Fruehauf van trailer was eastbound on Interstate 40, a divided 4-lane highway. The combination was in the right traffic lane and descending a slight downgrade. There were torrential rains and water was collecting on the roadway surface. The truck crossed a bridge that had depressions in the roadway surface. Shortly past the bridge, the truck unit went out of control. Tiremarks started in the right lane, continued onto the right shoulder, and came back across both eastbound traffic lanes. Gouge marks in the road surface showed where the truck unit rolled over onto its right side while in the left eastbound lane. The truck unit continued sliding on its right side across the median and across both westbound traffic lanes. One westbound passenger car struck the right top corner of the cab just above the windshield on the passenger side of the tractor. Another westbound passenger car ran into the top of the trailer about 10 feet aft of the front of the trailer. There were 692 feet 6 inches of tire skidmarks and gouge/scrape marks left by the truck unit. The truck combination remained connected via the fifth wheel and came to rest blocking both westbound traffic lanes facing north.

The unrestrained truckdriver died at the scene. The coroner listed the official cause of death as "Multiple bodily injuries resulting in massive internal and external hemorrhage." One car driver received moderate injuries. The other car driver and a car passenger received minor injuries. All occupants of the automobiles were treated at a local hospital and released. The tractor was destroyed and the trailer received substantial damage. The passenger car that struck the cab area was destroyed and the other car received minor damage.

A postcrash inspection of the tractor and trailer revealed no evidence of preaccident failure or deficiencies. Additionally, during the investigation, eastbound vehicles were observed crossing the bridge just prior to the accident site. These vehicles bounced upon entering and exiting the bridge.

Claremont, North Carolina
Case No. 118

An investigation into the fatally injured driver's employment history revealed that he was hired by his present employer in June 1988 as a local truckdriver picking up new furniture within a 100 mile radius of the company. He had 20 years of heavy truck driving experience; however, he had received no truckdriving training from the carrier. Driving records revealed that the driver had a valid North Carolina Class A license that was issued on June 1, 1988, and expires on May 31, 1992. The record had speeding convictions listed for March 2, 1983 and June 17, 1987. There were no accidents listed. The National Drivers Register (NDR) had no listing on the driver.

The investigation revealed that the truckdriver required a lot of sleep and had a hard time awaking. His past job had allowed him to sleep until 10 a.m. each morning, and he apparently had not adjusted to his new job's time schedule; this job required him to be at work by 7 a.m. every weekday morning. Most of the time, the driver would not be at work on time and the carrier had to call and wake him up.

The carrier, Shelba D. Johnson Trucking, Inc., of High Point, North Carolina began operating in 1985 as a common carrier regulated by the Interstate Commerce Commission and subject to Federal Motor Carrier Safety Regulations. The Office of Motor Carrier conducted a safety audit of the carrier on August 17, 1987, which resulted in a "conditional" compliance rating being assigned. As of October 11, 1988, the conditional rating was still valid.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of a safe operating speed for the roadway and weather conditions. It is possible that driver fatigue contributed to the accident.

CASE NO.: 119

Investigation No.: ATL-88-H-TR19
Accident Location: Railroad Grade crossing of Owenby Drive and Georgia Northeastern Railroad; .1 mile north of Marietta, Georgia
Lanes: 2 lanes, undivided
Shoulders: Dirt; 0-3 feet on each side.
Median: None
Features: Grade crossing.
Date and Time: July 27, 1988, 7:22 a.m.
Ambient Conditions: Clear and dry.
Heavy Truck Involved: 1987 Mack truck, concrete mixer, filled with 9 cubic yards of concrete
Motor Carrier: Allied Readymix, Inc.
Type of Operation: Private carrier
Size of Operation: 15 power units, 125 straight trucks
Total Weight of Truck: 60,000 pounds
Total Length of Truck: 25.5 feet
Other Vehicle Involved: Train
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

A concrete mix plant owned by the intrastate motor carrier was located in the southeast quadrant of the grade crossing. After taking on nine cubic yards of concrete, the truck departed the plant and entered Owenby Drive about 100 feet east of the grade crossing as a southbound freight train approached with its horn and bell sounding. The westbound truck proceeded onto the track and its right side was struck by the southbound train. The truck and train became entangled and moved about 100 feet south along the track. At rest, the truck remained engaged with the front left of the single locomotive of the train. The concrete mixer body was torn off the truck and came to rest about 60 feet south-southeast of the crash location. The locomotive of the train was derailed, but all of its 19 freight cars remained in line on the track. The grade crossing was equipped with crossbucks, one facing east and the other facing west on Owenby Drive. Both were attached to a single post located in the southwest quadrant of the crossing. The two train crewmembers estimated the speed of the train at 10-12 miles per hour.

The truck was destroyed, and the concrete mixer received extensive damage. The unrestrained driver was trapped in the truck and killed. The locomotive of the train was extensively damaged; none of the trailing freight cars were damaged. Neither of the two crewmembers of the train were injured.

The truckdriver had about eight years experience in heavy trucks, one year with his current employer. His training included a professional truck driving school in the 1970s and successful completion of the carrier's training school at the time of the current employment. The truckdriver had a valid Georgia Class 5 driver license with no restriction. However, he wore glasses while driving. His driving history showed no traffic conviction or accident during the last three years.

Marietta, Georgia
Case No. 119

Although the intrastate motor carrier was not subject to Federal Motor Carrier Safety Regulations (FMCSR) or to regulations adopted by the State, it was operating in compliance with many of the regulations. The truckdriver had a current medical certificate, and the carrier maintained records of hours of service (time cards). There was no evidence of excessive hours of service or fatigue of the truckdriver. The motor carrier required a drug test by a particular private laboratory prior to any employment. Accordingly, the truckdriver tested negative for marijuana and various other drugs on September 8, 1987.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 10 ng/ml of the psychoactive component of marijuana (THC) and 47 ng/ml of the non-psychoactive component of marijuana. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Georgia. This screening indicated the "presence" of THC (marijuana).

The Georgia laboratory's screening of the blood specimen revealed the presence of marijuana even though the laboratory did not confirm this finding with an independent analytical technique. The Center for Human Toxicology did confirm this finding.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was impairment of the truckdriver due to his use of marijuana.

CASE NO.: 120

Investigation No.: LAX-88-H-TR18
Accident Location: I-5 at Lerdo Highway Overcrossing, Button Willow, California
Lanes: 4 lanes, divided
Shoulders: Right shoulder; 10 feet wide asphalt surface
Median: 74 feet wide, dirt surface
Features: At grade, straight, and level roadway
Date and Time: August 2, 1988, 5 a.m.
Ambient Conditions: Dark, dry, 65°F, Clear weather conditions
Heavy Truck Involved: 1977 White Freightliner 2-axle COE tractor in combination with 2 trailers
Motor Carrier: Corcoran Motor Transport Inc.
Type of Operation: Contract Carrier
Size of Operation: 34 power units
Total Weight of Truck: 24,800 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The 1977 White Freightliner tractor was pulling two empty bottom dump utility trailers. The vehicle was observed by witnesses to be traveling southbound on I-5, approaching Lerdo Highway overcrossing, at approximately 62 mph. A loud "pop" was heard by witnesses and the vehicle was observed to veer to the right, off the roadway and onto the dirt area of the highway. The vehicle continued southbound on the freeway shoulder, climbed the dirt embankment on the north side of the Lerdo Highway overcrossing, and struck the upper portion of the north face of the concrete overcrossing. The vehicle rotated to its left and came to rest on its left side on the roadway surface, blocking both southbound traffic lanes south of the overpass. Irregular shaped tiremarks were found approximately 552 feet north of the overcrossing, extending south onto the asphalt shoulder for approximately 167 feet.

Numerous tiremarks and fresh gouges were found on the raised asphalt berm, beginning approximately 575 feet north of the north edge of Lerdo Highway overcrossing, and extending in a southward direction for a distance of 354 feet.

The accident resulted in fatal injuries to the unrestrained driver of the combination unit. The driver was trapped within the wreckage of the cab and was extricated by emergency rescue personnel at the scene. He was air lifted to Kern County Medical Center and pronounced dead at the hospital. The tractor received substantial damage to the drive train, engine, suspension system, steering components, and rear axle assembly. The cab sustained major crash deformation to the right front and top. Minor to moderate damage was sustained by the semitrailer and pull trailer. Most of the damage to the trailers was confined to the exterior sheet metal in the form of scrapes and minor metal deformation.

Button Willow, California
Case No. 120

The right front tire was examined and noted to have most of the tread separated from the casing. Also, a bulge and a corresponding one inch gouge was located on the outer edge of the tire tread pattern. An additional two inch gouge was located to the right of the one inch gouge along the circumference of the tire's outer edge. A jagged laceration was also observed in the tire casing. The exposed surface, in the area of the tread separation, exhibited tire threads with frayed ends and a belted surface smooth to the touch. Two pieces of tire tread matching the tread pattern of the right front tire were located at the accident scene by the NTSB investigator and released to the California Highway Patrol for analysis.

The driver of the White Freightliner, according to his employer, had been driving heavy trucks for a minimum of eight years. He had a class one operators license when he was employed by the present carrier eight years ago. A search of the California Department of Motor Vehicle files indicated that his current class one license was issued in 1983 and expired in 1991. His license was restricted to the use of corrective lenses. The record was void of violations and accidents. A 50-state check was completed on the driver and returned negative on suspensions or revocations. Also, a National Driver Register check was conducted with negative results.

A post crash mechanical examination of the White Freightliner combination, performed by the California Highway Patrol's Central Division Motor Carrier Unit, concluded that the brakes on axle #3 were out of adjustment. The report further concluded that, "The overall condition of the brakes on vehicle #1 should have been sufficient to maintain control of a loaded combination of vehicles." Also, an examination and analysis of the right front tire was conducted by the California Highway patrol. The CHP concluded that the tire experienced a "blowout", due to a previous impact with an unknown object, which damaged and weakened the casing, and continued use of the tire resulted in belt failure and ultimately a "blowout". It should be noted that the vehicle was not equipped with power steering.

The carrier had been in operation for 30 years and was a intrastate common carrier. An examination of the carrier's records by the California Highway Patrol revealed that the carrier "did not have driver's logs for all trips over 100 mile radius for the last month." The vehicle record examination indicated that the tractor was last serviced and inspected on 6-22-88. The tire record indicted that the right front tire was installed on the tractor on 8-29-87. The trailer records indicated that they were last inspected on 2-25-88; however, the brake drums on axles number four and five had recently been replaced, but there were no current trailer repair records.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,700 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Button Willow, California
Case No. 120

Blood samples from the truckdriver were also tested at the request of the State of California. This screening test indicated the "presence" of caffeine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this collision was the explosive failure of the right front tire.

CASE NO.: 121

Investigation No.: CHI-88-H-TR20
Accident Location: I-43 at Silver Spring Drive, Glendale, Wisconsin
Lanes: 6 lanes, divided
Shoulders: Right, none: Left, 1 foot concrete drainage gutter
Median: 16 feet wide with concrete New Jersey barriers
Features: Left Curve, bridge, 2.6 percent upgrade
Date and Time: July 29, 1988, 10:36 a.m.
Ambient Conditions: Clear, dry, daylight, approximately 90°F
Heavy Truck Involved: 1976 Mack dumptruck (conventional cab) in combination with a dump trailer, both loaded with rock
Motor Carrier: Stokdyk Sea Walls
Type of Operation: Common Carrier
Size of Operation: 4 straight trucks
Total Weight of Truck: 75,980 pounds
Total Length of Truck: 58 feet
Other Vehicle Involved: 1984 Ford F150 Pickup Truck, 1985 Plymouth Passenger car

Truck Fatalities: 2 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 2

FACTUAL SUMMARY:

The Mack dumptruck in combination with the dump trailer was traveling southbound on I-43 in the left traffic lane, approaching Silver Spring Drive at a witness estimated speed of 70 to 75 mph. The witness recalled a Ford pickup truck was traveling in the right lane next to the dumptruck. As the unit approached the bridge over Silver Spring Drive and the entrance ramp from the drive onto I-43, the Ford pickup veered to the left, changing traffic lanes from right to left. The left side of the pickup truck impacted the right front corner of the dumptruck. After the initial collision the Mack dump combination, according to the witness, swerved (turned) to the right to avoid a second impact with the pickup. The dump combination continued in its right turn departing the left lane and crossing over the right lane and the entrance ramp. It impacted and overrode the "W-beam" guardrail and the bridge rail. It continued off the right side of the bridge, falling approximately 20 feet onto eastbound lanes of Silver Spring Drive. The dumptruck burst into flames and was engulfed by fire. It rolled over onto its right side and came to rest on the right traffic lane and shoulder of Silver Spring Drive. A passenger car eastbound on the Drive impacted the rear of the trailer of the dump combination as it lay on its side at final rest. The driver and passenger of the dump combination were fatally injured. The driver of the pickup truck received minor injuries--his passenger was not injured. The driver of the passenger car was seriously injured.

Investigators recorded skidmarks from the pickup truck on I-43. The pickup truck's left rear tire began skidding just left of the delineator for the left and right traffic lane, then back into the right lane, weaving from right to left for about 238 feet to the point where the pickup truck stopped across the right lane of I-43 with both left side tires flat.

Glendale, Wisconsin
Case No. 121

Investigators also recorded 162 feet of skid marks from the dump combination as it traveled south in the left traffic lane of I-43. An additional 124 feet of skidmarks were measured from the point where the unit swerved to the right, departing the left traffic lane, up to the collision with the bridge rails where the unit drove off of I-43. The dump combination traveled an additional 58 feet horizontally as it dropped 20 feet to the roadway below where it rolled over and burned.

The dumptruck and trailer combination were destroyed by the impact and postcollision fire. The pickup truck was moderately damaged, sustaining left side damage from the back half of the left front fender rearward to the rear bumper. The passenger car was destroyed by the collision with the dump trailer.

Information furnished by the carrier revealed that this driver had about 1 year of driving experience in the accident vehicle, and some experience driving long distance about 30 years before (1950's to 60's). The driver also had some local straight truck experience. He had learned truckdriving through hands-on experience; he had received no formal driver training. A check of his Wisconsin driver's license indicated that he had a valid chauffeur's license, with a restriction for glasses, and no convictions or suspensions.

The carrier (driver's son) and the driver's wife stated that the driver had been taking a 30 milligram dose of phenobarbital three times a day for the past 10 years for a nervous condition (a single episode of seizure about 10 years ago). The Wisconsin Department of Transportation, Bureau of Driver Licensing, was contacted about any possible restrictions to the driver's chauffeur's license while taking the drug phenobarbital. They stated that prior to July 1988, the only health question on the chauffeur's license application asked about any states of altered consciousness in the previous year. Since July 1988, questions concerning medication have been added which may have restricted his license. Phenobarbital is identified by the Code of Federal Regulations and the Office of Motor Carriers through 49 CFR 392.4, Appendix D, subchapter B; Table of Disqualifying Drugs and Other Substances as a schedule 4 drug/controlled substance. Phenobarbital (DEA #2285) is classified as a depressant; it is a disqualifying drug for commercial drivers.

A postcrash inspection of the Mack dumptruck and the Badger dump trailer found no evidence of a system or component malfunction. Witness statements and the police report/photographs indicated that the truck fell 20 feet from the bridge to the paved road surface below. It impacted the road, rolled over onto its right side and was engulfed by fire. The truck was equipped with saddle mounted aluminum fuel tanks (100 gallons on the left side and 60 gallons on the right). Both tanks were destroyed by the fire. The truck's exhaust system also runs down the right side of the unit.

The carrier had been in operation for about 4 years, hauling sand, gravel, and stone locally. However, they had one account hauling large quarry rock from Wisconsin to Illinois (interstate). The carrier was aware of the interstate account, yet failed to apply for any of the required authorities,

Glendale, Wisconsin
Case No. 121

and obtain/maintain any of the records (driver, vehicle, company) as required by Federal and/or State regulations.

The weather conditions at the time of the accident were clear, dry, and sunny, with temperatures in the 90°F range. Witness statements placed the dump truck combination in the left traffic lane and the pickup truck in the right lane as they approached the I-43/Silver Spring Drive interchange. At the interchange, the onramp for I-43 from the Drive merged with the right traffic lane, expanding the lane from 12-foot wide to 22-foot wide. There was no delineation from the ramp or any other lane markings that would guide merging traffic. The witnesses stated the pickup truck veered to the left, departing the right lane at the interchange, and was entering the left lane when the collision occurred.

Blood samples from the truckdriver were not sent to the Center for Human Toxicology for testing.

Blood samples from the truckdriver were tested at the request of the State of Wisconsin. This analysis indicated that the blood sample contained 900 ng/ml of phenobarbitol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was an improper lane change made by the Ford pickup driver.

Case No.: 122

Investigation No.: MKC-88-H-TR17
Accident Location: U.S. Highway 11W, 5 miles south of Bristol, Tennessee
Lanes: 4 lanes, divided
Shoulders: Left, 3 feet; right, 10 feet; both asphalt
Median: Grass, 20 feet wide
Features: straight, 1 percent downgrade
Date and Time: August 2, 1988, 11:10 a.m.
Ambient Conditions: Clear, daylight, dry
Heavy Truck Involved: 1973 Freightliner COE tractor
Motor Carrier: Harrell D. Jarrett
Type of Operation: Private Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 16,200 pounds
Total Length of Truck: 15 feet
Other Vehicle Involved: none
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The tractor was travelling southbound on a straight flat section of the highway in the outside lane. The driver applied his brakes and the tractor left 33 feet of skid before it went into a left turn. As the tractor went into the median, the right front wheel hit a drainage culvert. The tractor bounced out of the drainage culvert, travelled across the inside northbound lane, and came down in the outside northbound lane. The tractor continued traveling southeast off the roadway onto a driveway where the tractor turned over on its left side. The tractor then slid into the ditch. The tractor left a yawmark with a measured radius of 185 feet. The asphalt had an estimated drag factor of .50 to .70.

The unrestrained driver was found fatally injured, pinned in the tractor. The tractor received substantial damage to the left side of the cab.

This driver was a school teacher by trade. He had not been trained to drive heavy trucks, and did so only on rare occasions. In the past three years, he had driven the truck only four times. A driving record check indicated that he had no violations or accidents in the past three years. The driver has a valid Tennessee operator driver's license.

The Safety Board investigation revealed that the driver had left home the morning of the accident to have the tractor brakes repaired. Before leaving home, he had taken the license plate from his pickup truck and placed the license on the tractor. A work order was made out at the repair shop indicating that the foot valve hangs down. The facility was also directed to install mud flaps. After the accident the Safety Board investigator asked the mechanic who worked on the tractor to point out on another tractor what he repaired and to explain what he did as he pointed to each part. The mechanic pointed to the brake assembly and said that he took out three screws that attached the bracket assembly to the brake valve. He then said that he took

out two pins that fastened the brake pedal to the brake shaft. He took the shaft out of the brake pedal and bracket assembly and polished it. The owner of the repair shop was looking on as his mechanic explained and said that he saw the mechanic polish the brake shaft and that it was working just fine. The mechanic said that after polishing the brake shaft, he reinstalled the brake pedal on the tractor. The Safety Board investigation found no no evidence that the brake pedal was removed from the tractor, but there was evidence that the throttle shaft and throttle arm were worked on, and that two screws were replaced attaching the throttle arm to the throttle shaft.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 4,900 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the sudden mechanical failure of the brake pedal due to improper maintenance. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 123

Investigation No.: FTW-88-H-TR11
Accident Location: Interstate 5, 5 miles east of Tracy, California.
Lanes: 10 lanes, divided
Shoulders: Right, 9 feet; left, 9 feet; both concrete
Median: 35-foot grass and earthen median
Features: Elevated roadway
Date and Time: August 8, 1988, 5:40 a.m.
Ambient Conditions: Clear and dry (darkness with lighted highway)
Heavy Truck Involved: 1980 Kenworth COE in combination with a loaded 45-foot van trailer
Motor carrier: Walter Sphar Trucking
Type of Operation: Contract Carrier
Size of Operation: 11 power units
Total Weight of Truck: 58,000 pounds
Total Length of Truck: 65 feet (approximate)
Other Vehicle Involved: 1978 Ford F-250 pickup truck (parked on shoulder)
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 1

FACTUAL SUMMARY:

Witnesses first observed the Kenworth combination unit travelling at approximately 55-60 mph northbound in the center of the three lanes of I-5. As it passed by the I-205 on-ramp, the Kenworth veered to the right across three lanes of traffic and sideswiped a Ford F-250 that was parked on the shoulder of I-5. At impact, the right front tire on the Kenworth tractor was punctured and the driver lost steering control. The combination unit travelled approximately 125 feet on the travel lane and shoulder after impact. During this movement, the left side tractor drive axle tires left yawmarks on a measured radius of approximately 312 feet. The vehicle then departed the road, overturned onto its left side, and slid down a 20-foot embankment for approximately 160 feet before coming to rest. When it came to rest, the rear end of the trailer was positioned on its left side on top of the shoulder curb and the tractor was at the bottom of the embankment on its left side and top. The Ford pickup truck travelled about 35-40 feet after impact and came to rest partially on the shoulder with its front end on the right roadside. Interstate 5 is a 6-lane divided highway in this area that changes to a 10-lane divided highway as it passes by the interstate 205 interchange.

At approximately 12:15 p.m. on 8/7/88, the Kenworth driver departed Alturas, California, on an approximate 425 mile trip to Stockton, California, with an intermediate stop at San Francisco. The driver travelled approximately 208 miles in 4 hours and took a break from 4:15 p.m. until 5:15 p.m. in Corning, California. This was the last entry in the driver's log book. He was scheduled to make a delivery in San Francisco that evening, obtain some rest, and deliver in Stockton the following morning. Records did not reflect when he delivered in San Francisco or when he departed for Stockton.

Tracy, California
Case No. 123

The Ford pickup sustained substantial damage and the driver, who was asleep in the cab, received minor injuries. The Kenworth combination unit was destroyed and the unrestrained driver was killed. The roof of the Kenworth was crushed extensively, and it took several hours for rescue personnel to extricate the driver.

A postcrash inspection of the Kenworth showed that there were no defects in the right front tractor tire or the steering system. Additionally, there no tiremarks prior to the impact area that would have indicated a loss of control type accident.

The Kenworth driver had approximately 15 years experience operating heavy trucks and had been working for his present employer for approximately 3 years. In the preceding three years the Kenworth driver had been convicted of 1 traffic violation, but had not been involved in any other traffic accidents.

The driver's wife indicated that he was in good health and records at their local hospital showed that he had not been treated for any illness or injury since 1976. However, the driver's well-being was not typical before departing on the accident trip--he had indicated to his wife that he felt tired before his departure. The wife indicated that this was a result of her husband only having one day off before having to depart on an overnight trip.

The operator of the parked Ford pickup was found to have a suspended driver's license, resulting from a prior DWI conviction. However, the driver had been issued an occupational permit to operate a vehicle in the course of employment, and it was determined that he was operating his employers's truck at the time of the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,100 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 124

Investigation No.: FTW-88-H-TR10
Accident Location: California State Route 89, 4.5 miles south of Sierraville, California
Lanes: 2 lanes, undivided
Shoulders: Right and left, both varying width with gravel
Median: None
Features: 3 percent upgrade on a 900-foot radius curve
Date and Time: August 4, 1988, 1:10 p.m.
Ambient Conditions: Clear and Dry
Heavy Truck Involved: 1972 Kenworth conventional in combination with an adjustable length logging dolly
Motor carrier: Edward Hood Logging Company
Type of Operation: Private Carrier
Size of Operation: 5 power units
Total Weight of Truck: 24,540 pounds
Total Length of Truck: 34 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 **Truck Injuries:** 0
Other Fatalities: 0 **Other Injuries:** 0

FACTUAL SUMMARY:

The Kenworth tractor was southbound negotiating an approximate 900-foot radius curve to the left when it departed the travel surface at an approximate 6° angle, travelled 60 feet, and sideswiped a rock wall. This impact fractured the output shaft on the steering gear box and ruptured the right front steering axle tire of the Kenworth, causing the driver to lose steering control. From the initial impact area, the vehicle travelled approximately 66 feet with its left side tires on the pavement. It then veered to the right and travelled another 50 feet before vaulting down an 11-foot deep embankment. The Kenworth struck a large boulder at the bottom of a creek bed and came to rest in an upright position. When the second impact occurred, the 6,500 pound logging dolly carried on the rear of the tractor frame came forward and crushed the tractor's headache rack into the rear of the cab.

At approximately 12:30 p.m., the truckdriver departed Loyalton, California, on an approximate 40 mile trip to Lacey's Timber Sales in rural Sierra County. The accident occurred after he had driven approximately 20 miles. He had been on duty for approximately 8 hours at the time of the accident.

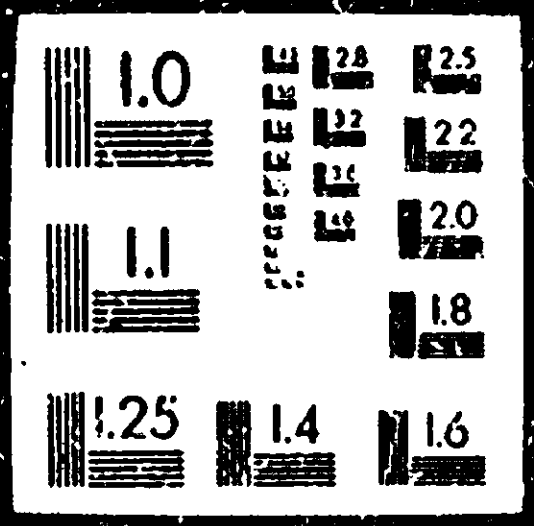
The rear of the tractor cab was pushed inward approximately 3 feet and the unrestrained driver was killed. The tractor was not equipped with restraints.

The driver was pinned in the tractor and survived for approximately 35 minutes. Immediately after the accident he began sounding his air horn and highway maintenance workers nearby came to his aid and summoned the police. The driver was able to speak, but he made no statements about how the accident

4 OF 5

PB 90

917 003



Sierraville, California
Case No. 124

occurred--he died before rescue workers were able to extricate him from the wreckage. Police investigators found a small amount of cocaine in the driver's pocket when he was extricated from the wreckage.

The approximate 900-foot radius curve was preceded by a curve warning sign with a 45 mph advisory limit. This sign was positioned approximately 400 feet in advance of the curve. There were no critical speed scuffs on the pavement to indicate that the driver entered the curve at an excessive rate of speed. Analysis of the fractured steering gear output shaft at the NTSB Materials Laboratory showed that the shaft had features typical of ductile torsional overstress. Investigators learned from the driver's wife that the driver had complained about the seat cushion on the tractor coming loose from the seat frame while he was driving. She stated that her husband had tied the cushion on the frame with a piece of elastic material several times during the two days preceding the crash. The driver's seat was cut out of the wreckage during the extrication, and its precrash condition could not be determined.

The driver's relatives indicated that the driver had been operating heavy trucks for 23-25 years. A search of the driver's state driving record showed that he had not received any traffic violations or been involved in any accidents in the preceding three years. The investigation revealed that the driver usually worked a 10 to 13 hour day, beginning at 5 a.m. He had worked a 13 hour day the day before the accident, and had slept 6.5 hours before going back on duty at 4:30 a.m.

The motor carrier did not maintain driver qualification files on any of its drivers. It was not determined if the driver had a current medical certificate. The autopsy showed that the driver had old cerebrocortical contusions consistent with old cerebrocortical trauma, and he may have had a seizure disorder secondary to the remote craniocerebral trauma.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 80 ng/ml of cocaine and 2,300 ng/ml of benzoylecgonine (metabolite of cocaine). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California. This laboratory reported a total of cocaine and its metabolites of 7,500 ng/ml using a radioimmunoassay (RIA) screen technique. However, the RIA screen measures the cocaine metabolite, benzoylecgonine, and reacts weakly with cocaine and other metabolites. In addition, a separate analytical technique must be used to confirm and quantify a drug identified by a screening method. Therefore, the value reported by the California laboratory cannot be considered quantitative for cocaine and cocaine metabolites.

Seirraville, California
Case No. 124

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to cocaine use. Fatigue may have contributed to the accident. Contributing to the accident severity was the lack of an adequate barrier between the load and the cab of the power unit.

CASE NO.: 125

Investigation No.: NYC-88-H-TR15
Accident Location: Interstate 287, near Morristown, New Jersey
Lanes: 6 lanes, divided.
Shoulders: Right, 10 feet: left, 3 - 15 feet; both asphalt
Median: 5 feet 9 inch concrete barrier
Features: Depressed, level
Date and Time: April 7, 1988, 10:40 a.m.
Ambient Conditions: Daylight, overcast, raining,
Heavy Truck Involved: 1987 Autocar dump-body truck
Motor Carrier: Sinbad Trucking, Inc.
Type of Operation: Unknown
Size of Operation: Unknown
Total Weight of Truck: Undetermined
Total Length of Truck: 23 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

A 1987 Autocar dump-body truck was northbound on Interstate 287; it was raining and the roadway was wet. The truck was empty and traveling in the left lane at a witness estimated speed of 40 to 45 mph. The truck, after rounding a left curve, entered a straight section of roadway and, according to a witness, suddenly veered to the left and ran off the roadway and struck a concrete median barrier. The vehicle mounted the barrier and struck a concrete bridge pillar at the South Street overpass. The unrestrained 49-year-old truckdriver was killed.

The Medical Examiner found that the case driver was using three names, Sindibat Abuk, Sindibat Tebu, and Satiye Tebu. The case driver's experience with this type of truck could not be determined.

The Safety Board was not notified of this accident until August 1988. By that time the family of the case driver had moved and left no forwarding address. No other information was available regarding the driver's business or family.

A postcrash inspection of the vehicle revealed no mechanical discrepancies. However, the left front wheel was missing two wheel lug bolts and nuts.

The driver had two New Jersey driver's licenses; one for Sindibat Abuk and the other issued to Sindibat Tebu. The New Jersey Department of Transportation reported that the driver (Abuk) had 2 arrests for operating under the influence in 1970 and was arrested twice more in 1985 for the same thing while using the name of Sindibat Tebu. During the period from 1968 to 1986, Abuk had one speeding arrests, 2 operating under suspension arrests and 5 accidents. At the time of the accident, the driver possessed a valid New Jersey driver's license in the name of Sindibat Abuk. The license for Tebu was suspended.

Morristown, New Jersey
Case No. 125

A check with the New York Department of Transportation revealed that Sindibat Abuk had been issued one citation for speeding, one for operating under suspension, and was involved in one accident between 1974 and 1986. While the driver did not have a New York State driver's license, he had been assigned a control number. There was no New York record for Tebu.

Blood samples from the truckdriver were not sent to the Center for Human Toxicology for testing.

Blood samples from the truckdriver were tested at the request of the State of New Jersey with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's failure, for unknown reasons, to maintain his vehicle within the travel lanes.

CASE NO.: 126

Investigation No.: NYC-88-H-TR16
Accident Location: County Route 667, about 3/10 mile south of Route 641, Elk Township, Gloucester County, New Jersey
Lanes: 2 lanes, divided
Shoulders: None
Median: None
Features: straight, at grade
Date and Time: April 18, 1988, 11:44 a.m.
Ambient Conditions: Daylight, overcast, raining
Heavy Truck Involved: (A) 1987 Ford L9000 dump-body truck
(B) 1981 Mack tractor pulling a dump-body trailer
Motor Carrier: (A) Arbrisco Enterprises
(B) Rollins F. Hetzel
Type of Operation: (A) Common carrier
(B) Unknown
Size of Operation: (A) 13 power units
(B) Unknown
Total Weight of Truck: (A) 72,500 pounds
(B) unknown
Total Length of Truck: (A) 23 feet (approximate)
(B) 39 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 2 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

A 1987 Ford dump-body truck loaded with sand was northbound on Route 667, on a scheduled trip from Dorchester, New Jersey, to Conshohocken, Pennsylvania. It was raining, the roadway was wet. The Ford was traveling at a witness estimated speed of 45 mph. The 1981 Mack combination vehicle was southbound on Route 667. The Mack was loaded with sand and was traveling at a witness estimated speed of 45-50 mph.

As the Ford truck was approaching a parking lot located on the east side of the roadway about 3/10 of a mile south of Route 641, a passenger car traveling in the parking lot was approaching the exit to Route 667. The truck driver braked and the truck skidded out of control. The truck veered into the southbound lane and, as it was overturning, collided with the southbound Mack combination.

The Ford truckdriver was killed in the crash and the driver of the Mack combination died later in the hospital. It is unknown if either driver was restrained. The roof of the Ford was collapsed downward onto the seats in the occupant compartment. The Mack cab was crushed rearward and rightward into the driver's area.

The Safety Board was not notified of this accident until August 1988. Examination of the highway at the accident scene revealed the highway had been resurfaced since the date of the accident.

Elk Township, New Jersey
Case No. 126

The operator of the Ford truck had a valid New Jersey driver's license. A review of his driving record showed that he received one stop sign citation and 4 speeding violations since 1975. He had been involved in 4 accidents since 1979. The Ford driver had no formal training but did have about 15 years experience driving heavy trucks. NTSB investigators examined the Ford driver's personnel file at the office of the motor carrier and could not locate evidence of the Driver's Certificate of Qualification or the Medical Examiner's certificate, road test, or written test. At the time of the accident the Ford truck had a gross weight of 72,500 pounds, which exceeded the GVWR of 60,000 pounds.

The operator of the Mack had been involved in 3 accidents since 1980. He possessed a valid New Jersey Drivers' license.

Blood samples from the drivers were not sent to the Center for Human Toxicology for testing.

Blood and urine samples from the Ford dumptruck driver were tested at the request of the State of New Jersey. This test indicated that the blood sample contained 462 ng/ml of phenylpropanolamine. The urine sample was found to contain 1,110 ng/ml of psuedoephedrine and 46,030 ng/ml of phenylpropanolamine.

Blood samples from the Mack driver were also tested at the request of the State of New Jersey with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Ford truckdriver's misjudgement of the safe operating speed for the wet roadway. Contributing to the accident was the sudden steering maneuver attempted by the Ford driver.

CASE NO.: 127

Investigation No.: NYC-88-H-TR17
Accident Location: State Route 15 north at milepost 8.2,
Jefferson Township, New Jersey
Lanes: 4 lanes, divided, ending a transitional area
northbound from 3 lanes to 2 lanes
Shoulders: Right 12 feet asphalt paved, left side none
Median: 65 feet, wooded
Features: Straight, depressed, 7 percent downgrade
Date and Time: May 17, 1988, 11 p.m.
Ambient Conditions: Darkness, clear, and dry
Heavy Truck Involved: 1988 Ford model F350 dump-body truck
Motor Carrier: Michael J. Toth
Type of Operation: Private
Size of Operation: 1 truck
Total Weight of Truck: 9500 pounds (approximate) GVWR 18,000 pounds
Total Length of Truck: 16 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The empty Ford dumptruck was northbound on a straight section of State Route 15 approaching the 8.2 milepost. The truck had just passed through a transitional area, where the roadway reduced from three lanes to two lanes, when it ran off the right side of the highway and mounted the curb. The truck rolled over, struck a rock embankment and, after traveling 223 feet, came to rest upright on the shoulder. During the crash the dump-body separated from the frame and was found 57 feet north of the truck on the left median.

During the crash the unrestrained 30-year-old driver was ejected and killed. His body was found on the highway about 148 feet north of the truck.

Prior to the crash the driver had been at his brother's residence where he had consumed several beers. The brother reported that the driver had left the house at about 9:30 p.m. the evening of the accident. Investigators were unable to determine the destination of the truck or account for the time lapse between leaving the residence and the crash.

The driver's wife stated that her husband was a bricklayer and operated the truck incidental to his business. She stated that he had an alcohol abuse problem and that, during the last six months, he had sometimes consumed two cases of beer a day.

New Jersey Drivers' Records indicated that the driver had been involved in 4 accidents and received 8 traffic violations since 1975, 7 of which were for speeding.

Jefferson Township, New Jersey
Case No. 127

The Safety Board was not notified of the accident until August 3, 1988 and was unable to obtain independent toxicology samples, however, postmortem toxicology reports from the State of New Jersey indicate the driver had a BAC of 0.28 percent.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to alcohol. Contributing to the severity of the driver's injuries was the failure of the driver to wear the available lap-shoulder belt.

CASE NO.: 128

Investigation No.: LAX-88-H-TR19
Accident Location: Eastbound Valley Boulevard, Walnut, California
Lanes: 5 Lanes, undivided
Shoulders: Right, 10 feet, dirt; left; none
Median: 10 feet center turn lane
Features: At-grade straight, level
Date and Time: April 4, 1988, 1:15 p.m.
Ambient Conditions: Daylight, clear, dry, 80°F
Heavy Truck Involved: 1978 Ford COE 2-axle tractor
Motor Carrier: J.N.C. Transportation
Type of Operation: Unknown
Size of Operation: 1 power unit
Total Weight of Truck: 12,840 pounds
Total Length of Truck: 16 feet
Other Vehicle Involved: 1986 Mercury Cougar 2-door coupe
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1978 Ford tractor was traveling eastbound on Valley Boulevard and was observed by witnesses to be traveling 60 - 75 mph in a 40 mph zone. The truck tractor was observed to proceed through a red traffic signal for eastbound traffic on Valley Boulevard at Brea Canyon Road and continue eastbound at a high rate of speed. As the Ford tractor continued east on Valley Boulevard, it entered a curve to the left, ran off the road, and struck a road sign. The vehicle re-entered the roadway and came upon a Mercury Cougar traveling in the number one of two eastbound traffic lanes. According to the driver of the Mercury Cougar, he was traveling at 45 mph when he heard a loud "bang" from behind. Not realizing he had been struck by a truck he continued east for about 1/2 mile until his vehicle quit running. From the impact with the Mercury, the tractor veered to the right and plunged 25 feet into a flood control channel located approximately 62 feet south of the eastbound roadway edge.

The truckdriver was ejected and landed approximately 10 feet east of the tractor's point of rest. A passerby who observed the dust cloud and heard the noise made by the case vehicle responded to the flood control channel to render aid to the driver. According to witnesses, an odor of an alcoholic beverage was detected on the driver's breath. At 2:08 p.m. the driver was pronounced dead at San Dimas Hospital, San Dimas, California as a result of his injuries.

On 8-5-88 the driver of the Mercury Cougar contacted the California Highway Patrol and advised the authorities of his involvement in a collision; however, he was not aware of what struck him. Upon inspection of his vehicle the imprint of the case vehicle's front license plate was found to be on the rear rubber bumper of the Mercury Cougar.

A postcollision interview with the truckdriver's father revealed the following: The driver left his home in Pomona, California at about 7 a.m. and

arrived in La Puente, California to pick up his helper Mr. Duarte at about 7:30 a.m. They both continued to Veg-Land Inc., in Brea, California to pick up a trailer load of pineapples to be delivered to Albertson Markets in Brea, California. They arrived at Albertsons at about 9 a.m. and had finished unloading the load by 11 a.m. They returned to Veg-Land and dropped the trailer. The driver then returned his helper back home to La Puente, California arriving at about 12 noon. The driver stayed around the apartment complex in La Puente, California talking with friends until 1 p.m. and then left for his home in Pomona, California. According to Mr. Duarte, no alcoholic beverages had been consumed by the driver the entire day they were together. The driver crashed 15 minutes after leaving the home of Mr. Duarte.

The driver had been operating heavy trucks for two years and was trained by his father. He had worked as a lease operator for two years for J.N.C. Transportation and had completed his workday on the day of the collision. He owned only the one power unit and no other equipment. A search of his California Department of Motor Vehicle record history from 1-6-79 to 6-27-87 revealed (1) conviction for drunk driving on 2-8-79; one accident on 8-19-86 in a passenger vehicle, a failure to appear violation and a turning movement violation on 6-27-87. A National Driver Register Check and 50-State license check were both returned negative.

A post collision inspection of the tractor found the foundation components of the brake system to be in good repair, and the steering system was found to be intact and functional. The cab sustained minor crush damage downward on the left front top area, however, the occupant area was not compromised. The front windshield was missing and moderate impact damage was sustained by the left front of the cab. The vehicle was equipped with a lap belt restraint for the driver seat position, however, the belt was fully retracted and full of debris, showing no signs of recent use.

At the time of the collision the driver was not pulling a trailer and had completed his work day several hours prior to the collision. The accident occurred while he was enroute home from a friends home, thus using the vehicle as a means of transportation to his residence--not functioning as a lease operator on duty.

An investigation into the carrier's operation revealed that the carrier, J.N.C. Transportation, had employed the case driver and his truck tractor as a lease operator, but established no written lease agreement between them. The driver had been hauling an interstate shipment of produce from Los Angeles Harbor, to Brea, California, which is outside of the established commercial zone of the Los Angeles basin. The load was interstate commerce and was reported to have been delivered within the commercial zone.

Further investigation revealed that the carrier was also required to be registered with the California Public Utilities Commission to verify proof of required insurance coverage. J.N.C. Transportation had not complied with the P.U.C. requirements over the past two years while operating as a motor carrier, nor was the P.U.C. knowledgeable of the existence of J.N.C.

Walnut, California
Case No. 128

Transportation. In addition, the carrier did not have in his possession maintenance records, driver qualification files, or driver logs.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.20 percent alcohol and 1,100 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of California. This analysis indicated that the blood sample contained 0.21 percent alcohol.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to his use of alcohol.

CASE NO.: 129

Investigation No.: FTW-88-H-TR12
Accident Location: North Carolina State Highway 109, 4 miles south of Denton, North Carolina.
Lanes: 2 lane, undivided
Shoulders: Right side: 2-foot 6-inch asphalt shoulder
Left Side: 2-foot asphalt shoulder
Median: None
Features: Level surface on a 625-foot radius right curve
Date and Time: November 2, 1987, 2:20 p.m.
Ambient Conditions: Clear and Dry
Heavy Truck Involved: 1983 GMC conventional 3-axle tractor in combination with a loaded 42-foot flatbed trailer
Motor carrier: Troy Lumber Company
Type of Operation: Private Carrier
Size of Operation: 3 power units
Total Weight of Truck: 70,000 pounds
Total Length of Truck: Approximately 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

At approximately 1:45 p.m., the GMC driver departed Troy, North Carolina, on an approximate 26 mile trip to Denton, North Carolina. After having travelled about 22 miles in 30 minutes the driver was involved in a rollover accident. The driver had been on duty for approximately 7 hours at the time of the accident.

The GMC combination was northbound on S.H. 109 carrying a load of lumber. A witness standing on the west roadside reported that when the unit entered the right curve the lumber shifted to the left, the trailer overturned, and shortly afterward the tractor flipped over. The witness indicated the GMC was travelling at about 65 mph when it entered the curve, and that the straps that secured the lumber did not break; but they were loose enough to allow the lumber to slip over the left side of the trailer edge. When the unit overturned the lumber spilled into a yard adjacent to the roadway and the combination unit slid approximately 343 feet on its left side and top. The unit came to rest upside down facing east across both lanes of the road. The scene marks showed that the unit was travelling at 65-71 mph when it entered the curve.

The GMC was not available for inspection at the time of the Safety Board investigation. It was not possible to determined if the straps came loose or if the load was improperly secured.

The tractor was crushed and the unrestrained driver was killed.

Denton, North Carolina
Case No. 129

The 68-year-old driver had approximately 50 years of heavy truck driving experience. According to the manager of the lumber company, the driver had worked for his father for many years, but then moved away. He had moved back to the local area and began working for him approximately 1 year prior to this accident. A search of the truckdriver's driving record showed that he had no traffic convictions or accident involvement in the preceding three years. However, an entry on the driver's record posted on 12/10/87, one month after this accident, showed that the driver needed to have a special examination. Driver license officials stated that the driver may have indicated he had a medical problem on his February 1987 renewal application, but the application was not available for confirmation. Moreover, the medical examiner indicated in his report that the driver suffered from hypertension, but a full autopsy was not performed.

It was not determined if the driver had a current medical certificate as required by the Federal Motor Carrier Safety Regulations (FMSCR) and adopted by the State of North Carolina. The motor carrier was not aware that drivers were required to be medically certified as qualified to drive, and he did not have any other of the required qualification files in his records.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 3,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the weight shift of the cargo which resulted from the combination entering the curve at excessive speed. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 130

Investigation No.: ATL-88-H-TR20
Accident Location: I-40, Winston-Salem, North Carolina
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; Left, 2 feet; both asphalt
Median: 32-inch-high steel guardrail barrier
Features: Right curve on ascending grade
Date and Time: November 14, 1987, 12:06 a.m.
Ambient Conditions: Clear, dry, darkness with street lighting
Heavy Truck Involved: 1985 Kenworth conventional tractor in combination with a loaded 40-foot logging trailer
Motor Carrier: Alan Ray Williams
Type of Operation: Private Carrier
Size of Operation: 5 power units
Total Weight of Truck: 79,500 pounds
Total Length of Truck: 57 feet
Other Vehicles Involved: 1986 Chevrolet pickup and 1978 Volkswagen
Truck Fatalities: 1 Truck Injuries: 1
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The combination unit, loaded with approximately 100 hardwood logs, was traveling westbound on I-40. I-40, at that location, consisted of a mile-long five percent descending grade in approach to a 600-foot-long, 5 percent, spiraling right curve that reversed the vertical alignment to a two percent upgrade. The unit entered the curve in the left lane and immediately began yawing and rolling left toward the median guardrail barrier. The unit continued forward through the curve for a distance of about 240 feet and traveled onto the ascending grade. It rotated approximately 45° about the longitudinal axis until the left side of the unit came in contact with the guardrail. The cargo of logs broke away from their chained securement. Some of the logs spilled beyond the guardrail and onto the eastbound traffic lanes. The unit continued forward in contact with the guardrail for a distance of about 350 feet. Although the barrier restrained the unit, it's remaining logs spilled over and onto the eastbound lanes before it came to rest. The unit remained coupled throughout the accident sequence. At rest, the unit was headed west with the left side of the tractor and empty trailer laying on top of the guardrail. The involved Chevrolet pickup truck and Volkswagen automobile were eastbound on the same roadway with single drivers aboard. Both vehicles crashed into the spilled logs and came to rest upright still headed east. The combination unit was not available for inspection at the time of this investigation; therefore, prohibiting an examination of the equipment. However, other available physical evidence did not indicate that a precrash defect of the unit initiated the accident. A westbound motorist advised that he was traveling 45 mph, about two miles in advance of the accident, when the accident truck passed him at an estimated speed of "60 plus" mph. The witness lost view of the truck on the curved roadway and next saw the vehicle just after it came to rest at the accident site. Advance traffic signs warned westbound motorists of the sharp curve ahead and advised trucks to use the right lane. The posted speed limit was 45 mph.

Winston-Salem, North Carolina
Case No. 130

The pickup truck and automobile received severe front end crush damage. The unrestrained pickup driver suffered minor injuries; the restrained automobile driver was not injured. The tractor was destroyed. The guardrail penetrated the left door and caused severe crush damage to the undercarriage and drive train of the truck tractor. The trailer received minor damage and continued in the motor carrier's service. The tractor was occupied by its driver and a passenger. The truckdriver was dead at the site and the passenger received severe injuries. Both of the occupants were unrestrained and remained inside the tractor. The tractor passenger advised that the truckdriver stopped shortly after they began the trip and purchased a 6 pack of beer and a similar quantity of malt liquor. She stated that they drank a portion of the malt liquor during the following 1 1/2 hours while traveling enroute to the accident site. Following the accident, the investigating police officer found 6 unopened bottles of beer and 2 unopened cans of malt liquor inside the tractor.

The motor carrier's principal business was cutting and merchandising timber from large tracts of woodland where it had purchased the standing trees. It's combination units were used to transport the harvested timber to customers. The carrier's operation was confined to the State of North Carolina and it's trucking operation was subject to the requirements of North Carolina's adoption of the Federal Motor Carrier Safety Regulations (FMCSR). The motor carrier operated five 4-member laboring crews that cut and loaded the timber at the cutting site. One member of each crew was assigned as a truckdriver who assisted in the loading of the timber then drove the truck to deliver the load. The motor carrier had qualified none of its drivers, did not maintain time records of their duty time or require them to prepare daily logs as required by the FMCSR. Neither did it follow an ongoing inspection and maintenance program on its vehicles required by the same regulations. The accident driver had no known formal truckdriver training. The Board Investigator was unable to determine his heavy truckdriving experience. He had been employed by the carrier as a part time driver for the previous 13 days, to drive trips when his regular drivers were unavailable, and had driven only 8 trips. The carrier owner had no knowledge of the driver's activities outside of his employment. The carrier conducted no background check on the driver nor required him to be medically examined; they had only assured that he had a North Carolina drivers licence before permitting him to drive their trucks. The driver held a valid Class A North Carolina drivers license restricted to wearing glasses. His North Carolina driving record revealed one traffic violation and no accidents in the previous 3 years. That record further revealed that his drivers license were revoked in 1974 for a period of one year and in 1976 for a period of 4 years for Driving Under the Influence. The Safety Board's investigation revealed that the truckdriver was driving while disqualified by Part 391 of the FMCSR. His privilege to operate vehicles in the States of New York and Virginia was under suspension; the reason for those suspensions were not shown on the records of the respective States. The Board Investigator was unable to determine the truckdriver's driving and duty hours for the preceding days. He had been driving on the accident trip approximately 1 1/2 hours when the accident occurred.

Winston-Salem, North Carolina
Case No. 130

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.18 percent alcohol, 1.7 ng/ml of the psychoactive component of marijuana (THC), 22 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 350 ng/ml of benzoylecgonine (metabolite of marijuana). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina. This test indicated that the blood sample contained 0.12 percent alcohol. Screening for other drugs was not done by the North Carolina laboratory.

The difference in blood alcohol concentrations as reported by the two laboratories could not be explained. However, it might have been due to each laboratory receiving blood taken from different locations in the body.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to his use of alcohol, marijuana, and cocaine. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 131

Investigation No.: FTW-88-H-TR13
Accident Location: Interstate 85, Gastonia, North Carolina
Lanes: 4 lane divided
Shoulders: Right, 14 feet; left, 4 feet; both asphalt
Left Side: 4-foot asphalt shoulder
Median: 35 feet, grass and earthen median
Features: Downgrade
Date and Time: November 19, 1987, 12:49 a.m.
Ambient Conditions: Clear and Dry (darkness)
Heavy Truck Involved: 1980 International COE tractor in combination with a loaded 44-foot van trailer
Motor carrier: Blake Hyde Trucking
Type of Operation: Common Carrier
Size of Operation: 52 power units
Total Weight of Truck: 60,265 pounds
Total Length of Truck: 60 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 0

FACTUAL SUMMARY:

The 1980 International combination was southbound on I-85 in Gastonia, North Carolina. As the unit entered a left curve, it departed the roadway to the right and struck a metal guardrail. The combination unit overrode the guardrail for approximately 236 feet and overturned. It then travelled approximately 145 feet down a grass embankment and struck a concrete drainage culvert.

The collision resulted in extensive damage to the tractor and trailer. The truckdriver was killed. It was not determined if the driver was wearing a seatbelt.

This collision was not reported to the Safety Board until August of 1988. At the time of the on scene examination there were no roadway marks associated with the accident. Police investigators stated that there were no tiremarks on the roadway on the night of the accident and that it appeared the unit gradually drifted out of its lane and into the guardrail. There were no witnesses. The combination unit was not available for inspection during the Safety Board investigation.

The driver of the International had been on vacation for the 2 weeks preceding this accident. He had reported for work at 5:30 p.m. on the evening of 11/18/87 and departed on a trip to Indiana at approximately 6:30 p.m. The driver had driven only 50 miles from his departure point to the accident location. He would have been able to cover that distance by approximately 7:30 p.m. Investigators were unable to determine the drivers activities during this 5 hours of unaccounted for time.

Gastonia, North Carolina
Case No. 131

The motor carrier's records showed that the 23-year-old driver had approximately 5 years of heavy truck driving experience. The driver had been working for this carrier for approximately 2 months. On the employment application there was a question that asked, "has your license ever been suspended or revoked?" the answer was left blank. The motor carrier provided documentation that they requested a state drivers license check on the driver on 9/14/88, the date of employment. The driver began working, and the North Carolina DMV did not provide the license check until 12/05/87. The three year driver history showed that the driver's license was suspended indefinitely for failure to comply with citations that were issued in another state. A National Driver License Register check and a five year search of the driver's history by the North Carolina DMV showed that the driver had been convicted of 10 traffic violations and had 7 out-of-State violations that he had not reported.

The driver's employment file also showed that the driver had used "speed" approximately one year previous to his application date. This disclosure was made during a pre-employment polygraph exam.

Blood samples from the International driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,200 ng.ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the International driver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the International driver's failure, for unknown reasons, to maintain his vehicle upon the roadway.

CASE NO.: 132

Investigation No.: ATL-88-H-TR21
Accident Location: SR 1002, Cary, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Both 10 feet ride, grassed
Median: None
Features: Tangent and level
Date and Time: December 14, 1987, 2:18 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1986 International tank truck, loaded
Motor Carrier: General Spray and Maintenance Service of Raleigh
Type of Operation: Private Carrier
Size of Operation: 6 power units
Total Weight of Truck: 19,090 pounds
Total Length of Truck: 19.5 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The tank truck, loaded with 650 gallons of liquid asphalt, was southbound on a tangent, level highway when it's right front wheel ran off the pavement onto the grassed right shoulder. The truckdriver steered the truck sharply to the left in an attempt to return the wheel back to the pavement. However, he overcorrected and lost control of the truck. The truck moved back onto the pavement and traveling in a southeasterly direction. Near the centerline of the highway, the truckdriver attempted to regain control by steering the truck sharply right. The truck responded by veering right and it's left rear tires began yawing left. Crossing the southbound traffic pavement and shoulder, the truck struck a guardrail that paralleled the outer shoulder. With the front end of the truck in contact with the guardrail, it's left front wheel broke away and the left front dropped to the ground. The vehicle skidded southerly on the left shoulder for a distance of about 56 feet and began overturning. It rotated 180° counterclockwise on it's longitudinal axis, disengaged from the guardrail, and came to rest. At rest, the truck was on it's top heading west. The driver was trapped inside the cab. Liquid asphalt spilled from the cargo tank onto the roadway and fire erupted immediately. Measuring the point where the driver lost control of the truck, to the point where it came to rest, the vehicle traveled about 200 feet. A motorist who observed the truck immediately after it came to rest said that the fire started in the engine area. Intense heat from the blazing asphalt delayed timely suppression of the fire. The truck was not available for inspection at the time of the investigation; therefore, prohibiting an examination to determine the cause of the wheel failure or the asphalt spillage. The investigating police officer calculated the truck's speed to be about 45 mph.

The truck received severe crush damage and was destroyed by the postcrash fire. It was not determined whether the trapped truckdriver was restrained. He was traveling alone and died in the fire.

Cary, North Carolina
Case No. 132

The motor carrier was a service type company that landscaped, seeded and maintained lawns at commercial buildings and seeding areas alongside highways and airport runways. The truck was enroute on a 5-mile trip between job sites. The carrier was subject to the requirements of North Carolina's adoption of the Federal Motor Carrier Safety Regulations (FMCSR) and the Federal Hazardous Materials Regulations (HMR). The truckdriver was a member of a labor crew who also drove the carrier's trucks when necessary. The 38-year-old truckdriver had no formal truckdriver training. He had driven medium sized trucks on a part time basis, when employed as a laborer, for about 15 years and had been employed by the motor carrier on a irregular basis for about 4 years. The driver was driving while disqualified by the FMCSR. He had no drivers license and had driven without a license for the prior 2 1/2 years. Before that time he held a unrestricted Class C North Carolina driver's license. His previous seven year driving record revealed two traffic violations and no accidents. Both of the violations were convictions for Driving While Intoxicated. The first conviction resulted in a 6-month revocation of his license. The second conviction resulted in a 4-year revocation that ended in April 1987. In July 1985, midway through the 4-year revocation, his drivers license expired. He failed to attend a scheduled hearing before a North Carolina Driver's License Examiner in April 1987 and his driving privilege was not reinstated--nor was his license reissued after that time. The motor carrier had made no attempt to qualify the truckdriver as required by the FMCSR Part 391, nor was it inspecting and maintaining its vehicles as required by Part 396. The motor carrier owner advised that he instructed his drivers to inspect their trucks daily and that he lubricated his vehicles "when necessary." Additionally, the truck was not placarded as required by the HMR when transporting liquid asphalt. The driver was in compliance with the FMCSR Hours of Service Regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.31 percent alcohol, 1,100 ng/ml of caffeine, and a 52 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina. This test indicated that the blood sample contained 0.32 percent alcohol and a 60 percent saturation of carbon monoxide. The truckdriver's sister advised that he had had an alcohol problem since 1972 and "got drunk" almost every weekend. The motor carrier said that he "understood the truckdriver was an alcoholic."

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the driver due to his use of alcohol. Contributing to the severity of the accident was the wheel separation causing the overturn and ultimate outbreak of fire. Also contributing to the severity was the inadequate cab structure of the truck.

CASE NO.: 133

Investigation No.: FIW-88-H-TR14
Accident Location: State Highway 73, 8.3 miles east of Lincolnton, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Both sides, 6 foot grass shoulders
Median: None
Features: 950-foot radius curve
Date and Time: March 22, 1988, 7:35 p.m.
Ambient Conditions: Clear and Dry (Darkness)
Heavy Truck Involved: Conventional 1987 Mack 3-axle tractor pulling a loaded 45-foot trailer
Motor carrier: J.A. Jones Construction Company
Type of Operation: Private Carrier
Size of Operation: 4 power units
Total Weight of Truck: 57,800 pounds
Total Length of Truck: Approximately 62 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

At approximately 11 a.m. on 3/22/88, the Mack driver departed Williamson, West Virginia, on a trip to Charleston, South Carolina. He planned an overnight stop at his residence in Cherryville, North Carolina, approximately 352 miles from his departure point. The driver's logbook showed that he stopped at 5:30 p.m. for fuel. At 7:35 p.m., after having completed about 300 miles of his trip, the driver was involved in a fatal accident.

The Mack combination unit was travelling west on State Highway 73 at an NTSB estimated speed of 54-62 mph when it entered a left curve and departed the travel surface to the right. The unit continued on the grassy roadside for approximately 120 feet and then struck a drainage culvert. The unit then came back on the roadway, skidded sideways for approximately 85 feet, and overturned. It slid on its top for approximately 120 feet before coming to rest. The vehicle's rate of travel was below the critical speed of the curve. There were no indications that the driver lost control or that the vehicle skidded out of the curve.

The Mack tractor's roof was crushed down to the instrument panel and the driver was killed. It was not determined if the driver was wearing a seatbelt. The driver was reportedly trapped in the wreckage for over an hour, and the death certificate showed the driver died from asphyxiation resulting from mechanical compression of the chest.

This accident was not reported to the Safety Board until August of 1988. At the time of the NTSB investigation the Mack truck was not available for inspection. However, there were no indications of a mechanical disablement.

Lincolnton, North Carolina
Case No. 133

Police investigators indicated that the unit drifted off of the road tangent to the beginning of the curve. The police also reported that there were no indications that other vehicles were involved--there were no witnesses.

The 37-year-old Mack driver had been working for the carrier since 1979. He first worked in the equipment yard and then went on to become a driver. He had approximately 5 years of heavy truck driving experience. A search of his driving record showed that he had not received any traffic violations or been involved in any accidents in the preceding three years. The driver's coworkers stated that the driver had indicated he wasn't feeling well when he departed on the accident trip. The driver had a valid medical certificate and there were no indications that he had any serious health problems.

Safety Board investigators noted several discrepancies on the driver's last 30 days of logbook records. The carrier had a policy requiring drivers to conduct pretrip inspections in accordance with the Federal Motor Carrier Safety Regulations (FMSCR), but none of the driver's preceding 30 days of logbook sheets showed that an inspection was performed. Additionally, on some occasions the driver's average speed appeared too high. He showed that he drove 85 miles in one hour on one day and on another day he showed that he averaged 61 mph.

In December of 1987, the Office of Motor Carriers conducted a review of J.A. Jones Construction company and, on 1/20/88, they issued the carrier a "conditional" compliance rating.

Blood samples from the Mack driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Mack driver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's failure, for unknown reasons, to maintain his vehicle upon the roadway. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 134

Investigation No.: ATL-88-H-TR22
Accident Location: SR 1128, 2.8 miles west of Bladenboro, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Both sides, 8 feet grass
Median: None
Features: Level, left curve, railway grade crossing
Date and Time: April 6, 1988, 6:30 a.m.
Ambient Conditions: Clear, dry, dawn
Heavy Truck Involved: 1984 Ford conventional tractor in combination with a 40-foot loaded dry-bulk tank trailer
Motor Carrier: C.B.R., Inc.
Type of Operation: Private Carrier
Size of Operation: 12 power units, 57 straight trucks
Total Weight of Truck: 80,000 pounds
Total Length of Truck: 54 feet, 2 inches
Other Vehicle Involved: 4 engine locomotive freight train with 117 loaded and 54 empty freight cars

Truck Fatalities:	1	Truck Injuries:	0
Other Fatalities:	0	Other Injuries:	0

FACTUAL SUMMARY:

The southbound combination unit was traversing a slightly curved, level highway in a rural residential area as it approached a railroad grade crossing. The crossing was installed with crossbucks and no other warning devices. Simultaneously, the freight train was sounding its horn as it approached the single track crossing from the east. The truck did not stop, but moved onto the crossing into the path of the train. The train arrived and struck the left side of the unit's tractor admidships and the trailer was separated from the tractor. All of the tractor's axles and longitudinal frame members were separated from the cab. The semitrailer overturned onto its right side and, along with the separated tractor axles and frame, came to rest on the roadway north of the track. Braking, the train continued west from the crossing with the tractor cab and engine compartment impaled on the front of the lead engine. About 123 feet west of the crossing the engine section of the tractor cab broke away at the firewall and came to rest on the railroad right-of-way at the south side of the track. With the driver still within, the tractor cab remained engaged with the train for a distance of about 251 feet. At that point, it disengaged from the locomotive and came to rest on the south right-of-way where the unrestrained driver was ejected and killed. The train continued on for an undetermined distance and came to rest without derailing any units. At rest, the tractor cab was on its roof with the driver lying on the ground about six feet away. There was no evidence of precrash deceleration or braking by the truck. The train was traveling about 45 mph when it was some 200 to 250 feet from the crossing and the engineer first sighted the truck. He stated that he realized that it was not going to stop. He applied braking to the train at that moment and seconds later struck the truck. The engineer was the only witness to the moving truck and gave no estimate of its speed. A Safety Board investigator calculated the speed of the truck as being between 16 and 22 mph.

Bladenboro, North Carolina
Case No. 134

The tractor was destroyed. The trailer sustained moderate crush damage. The leading unit of the train sustained moderate damage. None of the 4-man train crew were injured. A State Medical Examiner's report indicated that the truckdriver's death was caused by a "Crushed Left Chest" due to accident trauma.

The 55-year-old driver had no formal truckdriver training. He had driven heavy trucks for about 24 years and had been employed by the motor carrier for about 5 1/2 years. He held a valid unrestricted Class A North Carolina drivers license. His previous nine year driving record revealed no traffic violation or accident history. The intrastate motor carrier had qualified the truckdriver as required by Part 391 of North Carolina's adoption of the Federal Motor Carrier Safety Regulations (FMCSR). He was enroute on a 35-mile-long intrastate trip between two of the carrier's plant sites. The plant was located in the southeast quadrant of the grade crossing and in sight when the accident occurred. The truckdriver had crossed the accident track in the early morning hours many times over the past 5 years. On the morning of the accident, he had arose at 12:30 a.m., after only 5 hours of sleep. He had been on-duty 4.5 hours at the time of the accident. He had been driving less that one hour and was in compliance with the FMCSR Hours of Service Regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for BASES and anticonvulsants.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's failure, for unknown reasons, to yeied to the passing train. Fatigue may have been a contributing factor.

CASE NO.: 135

Investigation No.: DEN-88-H-TR18
Accident Location: State Highway 158, 16.2 miles west of Waycross, Georgia
Lanes: 2 lanes, undivided
Shoulders: Earthen, varying widths
Median: None
Features: Gradual left curve
Date and Time: December 29, 1987, at 2:04 p.m.
Ambient Conditions: Clear, sunny, temperature 60°
Heavy Truck Involved: 1978 International tractor in combination with a loaded 44-foot flatbed trailer
Motor Carrier: Esco Industries, Inc.
Type of Operation: Private Carrier
Size of Operation: 10 power units
Total Weight of Truck: 76,036 pounds
Total Length of Truck: 56 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1978 International tractor, pulling a 1974 Great Dane flatbed trailer loaded with sheets of gypsum board was westbound on Georgia State Highway 158. The truckdriver was a 61-year-old male that had a heart condition history. The truck was leaving a gradual, 5,730 foot radius left turning curve at witness reported speed of about 55 mph. At the end of the curve where the road straightened, the truck combination gradually veered off the right edge of the roadway pavement. Tire tracks revealed that the combination traveled 272 feet along the right shoulder and through the ditch to where it sheared a utility pole that was about 35 feet from the road edge. After striking the pole, the truck struck a culvert under a driveway that turned the truck back towards the roadway. As the combination came off the back of the ditch, it rolled over onto its right side, then came to rest in the ditch facing west. The combination remained connected via the fifth wheel. A witness, traveling behind the truck, stated that there was no sign of brakes being applied during the accident.

The unrestrained driver was found dead on the passenger side of the cab. Witnesses and the investigating officer stated that they found no blood coming from the open injuries on the driver. No autopsy was performed. The coroner listed the official cause of death as "Multiple injuries to head, neck, and chest." The tractor received substantial damage and the trailer was not damaged.

A postcrash inspection of the tractor by the Safety Board revealed no evidence of preaccident failure or deficiencies. The trailer was not inspected as it had been placed back into service.

An investigation into the fatally injured driver's employment history revealed that he was hired by his present employer in January 1984 as a local

Waycross, Georgia
Case No. 135

truckdriver (drives within a 100 mile radius of the company). At the time of the accident, he had 12 years of heavy truck driving experience, with no formal truckdriving training.

Driving records revealed the driver had a valid Georgia Class 5 license that was renewed on September 7, 1985, and expired on September 13, 1989. A restriction on the license required the driver to wear lenses when driving. The record had three speeding convictions and no accidents listed during the last three years. Additionally, the record listed two other convictions, one for speeding on August 31, 1984, and one for following too close, accident involved, on August 19, 1983. The investigation revealed, through interviews and carrier records, that the driver had three accident involvements in 1987. On February 23, 1987, a car ran a stop sign at an intersection and struck the driver's trailer in the left side. On March 25, 1987, the driver backed his truck unit into the front of another truck unit. In August 1987, the driver ran off the right side of the road and went into a grove of pine trees. The driver said a pickup truck made a U-turn in front of him and he drove off the road to avoid a collision. The Georgia Highway Patrol responded but did not make a report. The National Drivers Register had no listing on the driver.

The driver's medical records showed the following: On September 27, 1975, he had a heart attack and was treated by Dr. T. K. Stapleton, of Douglas, Georgia. On November 5, 1986, Dr. Rodney Vickers of Douglas, Georgia, treated the driver for chest pains and numbness on the right side. On December 24, 1986, the driver was treated by Dr. Fred Howard of Douglas, Georgia, for shortness of breath and chest pains. On February 5, 1987, the driver renewed his medical certificate with Dr. Vickers performing the examination. On the examination form under Health History, the driver marked "no" for cardiovascular disease. Dr. Vickers marked the examination form under vision for distance, with corrective lenses, the right eye was 20/20, and the left eye was marked "absence of sight." Additionally, the horizontal field of vision for the right eye was left blank and the left eye was marked "blindness left eye." Dr. Vickers issued a valid medical certificate to the driver after the examination. Federal Motor Carrier Safety Regulations, Section 391.41 (b) (10), requires a certified driver to have "distant visual acuity of at least 20/40 in each eye without corrective lenses or visual acuity separately corrected to 20/40 or better with corrective lenses, distant binocular acuity of at least 20/40 in both eyes with or without corrective lenses, field of vision of at least 70 degrees in the horizontal meridian in each eye."

An examination into the driver's activities for the 72 hours preceding the accident revealed that the driver had scheduled days off on Saturday and Sunday and painted his house. On Sunday, the driver complained to his son that he did not feel well. On Monday, the day before the accident, the driver worked an eight hour shift and then immediately went home, stating that he did not feel well, and that he should start taking his heart nitroglycerin medication again.

Waycross, Georgia
Case No. 135

The carrier began operating in 1982 as a private carrier subject to Federal Motor Carrier Safety Regulations (FMCSRs). Being a private carrier hauling their own goods, they were not regulated by the Interstate Commerce Commission. As of the accident date, no safety audit had been conducted on the carrier. However, the Office of Motor Carrier (OMC) conducted a safety audit of the carrier on May 18, 1988, which resulted in a conditional rating for not complying with FMCSRs. FMCSRs violations cited were as follows: section 390 - outdated copy of FMCSRs, section 391 - failure to conduct driver's annual review, section 394 -failure to report accident to DOT, section 395 - no established disciplinary policy for drivers who fail to comply with duty status reporting requirements, and section 396 -no established written vehicle maintenance procedures. As of October 20, 1988, the rating was still conditional.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,300 ng/ml of caffeine and that salicyate (aspirin) was present. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 136

Investigation No.: DEN-88-H-TR19
Accident Location: Georgia Highway 37, 5.4 miles east of Adel, Georgia
Lanes: 2 lanes, undivided
Shoulders: Both shoulders, 6 feet, earthen
Median: None
Features: At grade, level, gradual curve
Date and Time: January 21, 1988, 11:15 a.m.
Ambient Conditions: Cloudy, temperature in 60's
Heavy Truck Involved: 1977 International tractor in combination with a 38-foot pole trailer loaded with logs
Motor Carrier: R. C. Thompson Logging, Inc.
Type of Operation: Private Carrier
Size of Operation: 4 power units
Total Weight of Truck: 75,000 pounds
Total Length of Truck: 53.5 feet
Other Vehicle Involved: 1977 White tractor in combination with a half of a mobile home
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

Vehicle #1, a 1977 International tractor, pulling a pole trailer, loaded with logs, was westbound on Georgia Highway 37, a 2-lane paved road. Vehicle #1 was not equipped with a headerboard or protective rack of any kind. About 5.4 miles east of Adel, Georgia, on a long, gradual, curve, with a radius of 6,000.1 feet, with 2 bridges, at the bottom of a long slight downgrade, vehicle #1 met 2 eastbound tractors, with escort vehicles, each towing a 14-foot wide (oversized load), 64-foot long mobile home half structure. The oversized loads prevented two-way traffic passage on the bridges. As vehicle #1 approached the two bridges, the two mobile home units and second escort were eastbound between the two bridges. The lead escort had cleared the bridges, and gestured for vehicle #1 driver to stop so the trailing mobile home units and other escort vehicle could clear the second bridge without having to stop. Vehicle #1 slowed but did not stop and continued across the bridge. The lead escort warned the trailing units, via the CB radio, that they were going to have to stop as vehicle #1 did not stop. The first mobile home truck unit and second escort vehicle were able to stop at the bridge. The driver of the second mobile home unit, vehicle #2, stated his brakes would not hold as they were hot from usage on the long downgrade and previous stop at the first bridge, and he was unable to stop. He swerved into the westbound traffic lane and collided headon with vehicle #1. During the collision, the cargo on vehicle #1 came forward, crushing the cab and driver from behind. Investigating officials stated that they found no skidmarks from either vehicle.

The unrestrained driver of vehicle #2 received minor injuries and was treated at a local hospital and released. The unrestrained driver of vehicle #1 was trapped in the cab and died at the scene. No autopsy was performed. The coroner listed the official cause of death as "Massive internal injuries."

Adel, Georgia
Case No. 136

The logging tractor and trailer were destroyed. The other tractor received substantial damage and the mobile home was destroyed.

The investigating officials did not conduct a postcrash inspection on vehicle #1. No NTSB inspection was conducted on vehicle #1 as most of its parts had been salvaged and used on other units. The Georgia Public Service Commission did a postcrash inspection of the tractor of vehicle #2. Their inspection found the following: The service air brake hose, on the steering axle, between the right brake chamber and the relay valve was broken off at the connection to the relay, accident induced. The left front brake shoe lining on the steering axle was contaminated with oil or grease. The push-rod travel, on the drive axle brakes, both measured 2 1/4 inches on the type 30 chambers. The Federal Motor Carrier Safety Regulations maximum push-rod travel is 2 inches. The tractor of vehicle #2 was not available for an NTSB inspection. In August, 1988, the NTSB did an inspection of the electrical brakes on the mobile home involved in the accident and found that the brake shoes were about 1/8 inch thick, well within factory specifications.

An investigation into the fatally injured driver's employment history revealed that he had 20 years experience of heavy truck driving and had worked for R. C. Thompson Logging, Inc., intermittently over the last ten years. He had no formal truckdriving training or training from the carrier. Georgia driving records revealed the driver had a valid Georgia Class 5 license that was renewed on March 24, 1984, with an expiration date of April 13, 1988. There were no restrictions to the license. At the time of the accident, the record was clear of any violations, suspensions, revocations, and accidents for the last three years. The record also listed a speeding conviction on March 10, 1982. The National Drivers Register had no listing on the driver.

The company, R. C. Thompson Logging, Inc., of Nashville, Georgia, hauled cut logs from the forest to the lumber mills, and had been in business since 1980. In Georgia, logging is considered a farming operation and is not subject to authority of the Interstate Commerce Commission, Georgia Public Service Commission, or subject to the Federal Motor Carrier Safety Regulations.

Blood samples from the logtruck driver were,sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BENZOS, BASES, anitconvulsants, or analgesics.

Blood samples from the logtruck driver were also tested at the request of the State of Georgia with negative results.

Blood samples from the second truckdriver were also sent to the CHT for testing. No drugs were found in this test. Tests conducted at the request of the State of Georgia were also negative.

Adel, Georgia
Case No. 136

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the logtruck driver's apparent disregard of the visual warnings of the approaching wide loads. Contributing to the accident were the inadequate brakes on the White tractor and mobile home. Contributing to the severity of the injuries was the inadequate cab structure of the log truck and the absence of a header between the cab and the load.

CASE NO.: 137

Investigation No.: DEN-88-H-TR20
Accident Location: Copeland Street and Railroad Grade Crossing #729-039W in Baxley, Georgia
Lanes: 2 lanes, undivided
Shoulders: Both shoulders were earth and varying widths
Median: None
Features: At grade, level and straight
Date and Time: January 26, 1988, 10:50 a.m.
Ambient Conditions: Clear, dry, temperature 45°F
Heavy Truck Involved: 1975 Ford dumptruck loaded with hot asphalt mix
Motor Carrier: Eason's Soil Transport
Type of Operation: Private Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 68,980 pounds
Total Length of Truck: 24 feet
Other Vehicle Involved: Freight train
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 2

FACTUAL SUMMARY:

The Ford dumptruck was southbound on Copeland Street, traversing railroad grade crossing No. 729-03W, en route to a parking lot paving project. The grade crossing was a single railroad track, with passive crossing protection that consisted of yellow/black round railroad warning signs, pavement markings, and reflectorized railroad crossbuck signs. The northeast corner of the grade crossing/street was overgrown with high, dense, foliage. As the Ford crossed the track, it was struck in the left side by a westbound freight train. The impact was at the gap between the truck cab and cargo bed. The dumptruck came to rest along the north side of the track, in an up-right position, about 5 feet away from the track and about 62 feet from the point of impact, facing in a northwesterly direction. The train stopped on the track about 507 feet from the collision. The engineer stated the train was traveling about 20 mph at the time of the collision. The left saddle tank on the Ford, just below the driver's door, took part of the initial impact, ruptured, and caught fire. The fire burned a major portion of the cab and the driver was burned to death. There were tire skid and side smear marks on both sides of the track from the dumptruck.

Two train workers received minor injuries and were treated at a local hospital and released. The driver of the dumptruck was trapped in the cab and died at the scene. No autopsy was performed. The coroner listed the official cause of death as "Burns received in auto accident with train." The dumptruck was destroyed. The train had one set of wheels derail and received minor damage.

Local officials did not conduct a postcrash inspection on the Ford. No NTSB inspection was conducted on either as most of its parts had been salvaged by the time the Safety Board was notified of the accident in August 1988.

Baxley, Georgia
Case No. 137

An investigation into the truckdriver's employment history revealed that he had 20 years experience with heavy truck driving and had at one time owned and operated a logging truck. He had no formal truckdriving training and had received no training from the carrier. The carrier used the driver several times throughout the year. It was the driver's first working day in January for the carrier. He reported to work about 0745 hours and had been on duty for approximately 3 hours when the accident occurred. The owner of the carrier loaned the driver some money earlier in January and was letting the driver work off the loan. The driver's 72 hour activities prior to the accident could not be determined. Georgia driving records revealed the driver had a valid Georgia Class 5 license that was renewed on November 4, 1986, with an expiration date of November 19, 1990. There were no restrictions to the license. The three year driving history listed one speeding conviction and a suspension for no insurance. The National Drivers Register had no listing on the driver.

The carrier had been in business as a private carrier since 1971, building water ponds and doing forest site preparation within a 50 mile radius of Baxley. The dumptruck was the only truck owned by the carrier. Under usual operation, the business was not regulated by the Interstate Commerce Commission, Georgia Public Service Commission, or subject to the Motor Carrier Safety Regulations. However, on the accident date the owner verbally leased his dumptruck to haul asphalt for another company, Davis Paving Company. Cosequently, the carrier became subject to the Georgia Public Service Commission and Motor Carrier Safety Regulations. The carrier had no records of any kind on the driver.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BENZOS, BASES, or anticonvulsants.

Blood samples from both the truckdriver and the train engineer were tested at the request of the State of Georgia with negative results.

Blood samples from the train engineer were sent to the CHT for testing also. CHT determined that the blood sample contained 1,100 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's failure, for unknown reasons, to yeied to the passing train.

CASE NO.: 138

Investigation No.: ATL-88-H-TR23
Accident Location: Interstate 75, Macon, Georgia
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left, 3 feet; both asphalt
Median: 30 feet wide, metal guardrails placed back-to-back
Features: Interchange area
Date and Time: February 14, 1988; 6:55 p.m.
Ambient Conditions: Darkness/lighted; cloudy and dry
Heavy Truck Involved: 1979 Kenworth tractor in combination with a flatbed trailer loaded with 16 salvage (crushed) automobiles
Motor Carrier: Jessie D. Holloway
Type of Operation: Common Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 65,000 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 2
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit traveled north on Interstate 75 in Macon, Georgia. The driver was accompanied by two passengers, one in the right front and one in the sleeper berth. The vehicle approached a 2292-foot radius right curve that extends through an interchange area. In the interchange, an entrance lane enters from the right as the northbound two-lane roadway passes under an overpass. Proceeding through the interchange in the left traffic lane, the vehicle swerved off the left of the roadway just beyond the overpass and struck a metal guardrail and utility pole. It continued along the guardrail a considerable distance with the driver attempting to regain control. Subsequently, the vehicle overturned to the left onto the guardrail and center median. It came to rest facing a northwest direction, the tractor was on its top left at the guardrail and the trailer was across the roadway. In the crash sequence, the cargo of crushed automobiles spilled and came to rest in the guardrail and center median area south of the overturned vehicle. The passenger in the right front (25-year-old son of the driver) stated to investigating police that a shifting of the cargo caused the vehicle to swerve off the roadway. The police were unable to corroborate the statement. A witness that had followed the combination unit for about one mile stated that he observed it swerve off the left side of the roadway twice before it struck the guardrail. The witness did not observe any cargo shifting before the vehicle first impacted the guardrail. The police did not estimate the precrash speed of the vehicle, nor was there sufficient evidence to enable the Safety Board investigator to determine the speed.

The tractor was substantially damaged. The upper portion of the cab was deformed down and toward the right rear and destroyed particularly toward the left side. The trailer reportedly sustained moderate damage. Damage to the cargo of crushed automobiles was neither identifiable nor significant.

Macon, Georgia
Case No. 138

The truckdriver was entrapped in the tractor and killed. Both passengers remained in the tractor, but neither received incapacitating injuries. Neither the driver nor the right front seat passenger was lapbelted.

The 47-year-old truckdriver had accumulated a total of about 12 years experience in heavy trucks over the past 24 years. No driver training could be documented. The truckdriver held a valid Georgia Class 5 driver license with no restrictions. His driving record showed no traffic convictions or accidents during the last five years.

The truckdriver was an independent owner/operator engaged in hauling crushed automobiles for hire. He had loaded the cargo of 16 crushed cars about 40 miles south of Macon and was enroute to his home about 15 miles north of the accident location. The truckdriver maintained no records of hours of service. Information from the above mentioned son/passenger revealed that the truckdriver had not worked excessively during recent days. However, the respondent acknowledged that he and his father had spent several hours drinking alcoholic beverages both at a local bar and at home during the evening and night before the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.23 percent alcohol, 2,900 ng/ml of caffeine, and a 14 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for anticonvulsants.

Blood samples from the truckdriver were also tested at the request of the State of Georgia. This test indicated that the blood sample contained 0.26 percent alcohol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to his use of alcohol. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 139

Investigation No.: ATL-88-H-TR24
Accident Location: Georgia 41, 2.4 miles north of Warm Springs, Georgia
Lanes: Asphalt; 2 12-foot wide lanes
Shoulders: Grass; 6 feet wide each side
Median: None
Features: Slight downgrade with left curve
Date and Time: February 19, 1988; 10:50 p.m.
Ambient Conditions: Darkness; cloudy and wet surface
Heavy Truck Involved: 1982 Freightliner tractor in combination with a trailer loaded with steel
Motor Carrier: J and M Transport, Inc.
Type of Operation: Common Carrier
Size of Operation: 120 power units
Total Weight of Truck: 79,660 pounds
Total Length of Truck: 60 feet
Other Vehicle(s) Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was traveling north on Georgia Highway 41, negotiating a four degree left curve on a long one percent descending grade. Entering the curve, the tractor moved onto the right shoulder of the roadway. As the vehicle continued into the curve, the tractor moved across the shoulder and into the ditch. The tractor began to overturn rightward and the trailer moved leftward. Jackknifed, the combination unit overturned to the right. The tractor reportedly skidded on its top for a considerable distance before it came to rest about 220 feet from where it left the roadway. The investigating police estimated the preaccident speed of the vehicle at 50 mph.

The tractor was substantially damaged, the upper portion of the cab was destroyed. The trailer and its cargo were substantially damaged. The driver was entrapped in the tractor and killed. It could not be determined whether he had been restrained by the available lapbelt.

The 26-year-old truckdriver had about eight years experience in heavy trucks. He was employed by a owner/operator that had been operating under a long-term lease to the carrier for about one month. The carrier had given the driver about four days training at the time of his employment. No previous training could be documented.

The truckdriver was licensed by both Georgia and Alabama. The Georgia Class 5 driver license was valid with no restriction. Georgia issued a original driver license on December 29, 1977. The license was upgraded to Class 5 on February 4, 1983. The Georgia driver history showed one speeding conviction and no accident for the last nine years. The Alabama operator license was current with no restriction. The license was originally issued on November 20, 1979, at which time the truckdriver surrendered a Georgia driver

license. The Alabama driver history showed no conviction or accident for the last five years. No driver record for the truckdriver was found in any other State.

The interstate motor carrier had qualified the truckdriver and maintained a Driver Qualification File in compliance with Federal Motor Carrier Safety Regulations (FMCSR). The file included a certification by the truckdriver that he held only a Georgia driver license. At the time of the accident, the truckdriver was in compliance with hours of service regulations. However, the investigation indicated that sleep cycle disruption due to alternating work schedules, in combination with the long work day, probably was a factor in the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.08 percent alcohol. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Georgia. This analysis indicated that the blood sample contained 0.14 percent alcohol. A screening test conducted on a urine sample was positive for the non-psychoactive component of marijuana (COOH-THC).

The blood alcohol concentrations as determined by the two laboratories differ more than expected based upon analytical uncertainties. The difference could not be resolved, however, it should be noted that the blood specimens were about 6 months old before they were shipped to the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to alcohol and fatigue.

CASE NO.: 140

Investigation No.: CHI-88-H-TR21
Accident Location: Cook Street at CSX Railroad Crossing Identification Number 340438C in Cartersville, Georgia
Lanes: 2 lanes undivided
Shoulders: Both, 2 feet wide, concrete curbs
Median: None
Features: Straight, 6 percent upgrade approach to grade crossing and a 7 percent downgrade departure
Traffic Control: Advance railroad crossing signs, pavement markings, stop lines and flashing signals
Date and Time: February 24, 1988, 8:52 a.m.
Ambient Conditions: Clear, dry, cold with bright early morning sunlight
Heavy Truck Involved: 1985 International 2-axle flatbed dumptruck (loaded with miscellaneous construction materials)
Motor Carrier: Duncan Wholesale Company
Type of Operation: Private Carrier
Size of Operation: 4 straight trucks
Total Weight of Truck: Unknown
Total Length of Truck: 25 feet
Other Vehicle Involved: 1978 GE switch engine and 1 railroad car
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The International flatbed dumptruck was traveling east on a straight section of roadway as it approached a signalized grade crossing that dissected the city street at a 60° angle. The unit failed to stop for the flashing railroad signal lights, and crossed the tracks into the path of a southbound switch engine. The truck was traveling at slow speed (approximately 10 mph) according to police and witness reports. The train was traveling at 32-34 mph according to the crew's statements to police. The train crew and one witness reported the train horn was sounding prior to the accident; two other witnesses could not recall hearing the horn.

The train engine impacted the left side of the truck, the train's coupling striking the left rear corner of the truck cab, carrying the unit approximately 549 feet south on tracks. The train remained on the tracks sustaining minor damage. The truck was destroyed in the collision; the unrestrained driver was found in the truck cab fatally injured.

The train engineer stated he was positioned on the blind side of the train cab and did not see the truck until the collision. The train's conductor stated he that saw the truck just before impact, and he called for a full brake application. The conductor also stated that the truckdriver did not appear to be aware of the flashing grade crossing lights, the train's lights, the train's audible warning device (air horn), or the train's approach.

Cartersville, Georgia
Case No. 140

The private intrastate carrier had been in the construction materials wholesale business for over 34 years. The carrier's operating territory was within the state of Georgia and usually within the county. Information furnished by the carrier indicated that the driver, who had been employed with the company for over 20 years as a truckdriver, was familiar with the area and the crossing. A check of the driver's license history and a 50-state check revealed that the driver's license was valid at the time of the accident and that the driver had not been convicted of any traffic offenses.

A postcrash inspection of the International truck found no evidence of systems' or components' malfunction. The only deficiencies noted on the truck were bald tires on the left front steering axle and a bald tire on right inside position on the driver axle.

The weather conditions at the time of the accident were clear and dry, and with an early morning sun out of the east. The Safety Board's noted that the early morning sun's glare blotted out the grade crossing's signal lights. Also, the vegetation growing along the northwest side of the railroad tracks was brought to the attention of the Safety Board's investigator. However, determination of any sight obstruction to the truck driver or train crew was not possible as the density of the vegetation would vary between the accident date (February 24) and the date the Safety Board was notified of the accident (October 10).

The roadside along the eastbound traffic lane of Cook Street was lined with wooden power poles. One pole, nearest the crossing, partially blocked the pole mounted railroad crossbucks and flashing lights from an eastbound driver's view. There were two reported train versus vehicle collisions reported at the grade crossing in 1988. The first (case report) occurred in February; the second occurred in August. Both occurred in the early morning hours on clear days with glaring sunlight. The Cartersville Police report of the fatal accident indicated that the flashing signal lights were inspected and tested following the accident and found in good working order.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BENZOS, BASES, or anticonvulsants.

Blood samples from the truckdriver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's failure to observe the active warning lights due to the early morning sun.

CASE NO.: 141

Investigation No.: ATL-88-H-TR25
Accident Location: Interstate 75, 9.4 miles south of Perry, Georgia
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left 3 feet; both asphalt
Median: 64 feet wide, grass, depressed
Features: At grave, level, straight
Date and Time: March 15, 1988; 7:40 p.m.
Ambient Conditions: Darkness, clear and dry
Heavy Truck Involved: (1) 1978 Ford F-800 straight truck
Motor Carrier: (1) American Coating Company (not a motor carrier)
Type of Operation: (1) Painting Contractor (not a motor carrier)
Size of Operation: (1) 2 trucks
Total Weight of Truck: (1) 12,000 pounds
Total Length of Truck: (1) 24 feet
Heavy Truck Involved: (2) 1979 GMC tractor in combination with two trailers laden with general freight
Motor Carrier: (2) Smalley Transportation Company
Type of Operation: (2) Common Carrier
Size of Operation: (2) 450 power units
Total Weight of Truck: (2) 68,000 pounds
Total Length of Truck: (2) 65 feet
Other Vehicle Involved: 1982 GMC Model 7000 straight truck
Truck Fatalities: 3 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

A GMC Model 7000 straight truck and a Ford F800 straight truck were stopped respectively on the right emergency lane (shoulder) of southbound Interstate 75. The GMC truck was occupied by only the driver, and the Ford truck was occupied by the driver and an unidentified passenger. A 50-gallon metal barrel affixed near the rear of the flatbed of the Ford truck contained an undetermined amount of paint. The GMC combination vehicle was southbound on Interstate 75. Intending to continue south, the two trucks moved forward along the right shoulder and accelerated. The driver of the GMC straight truck stated that he observed a vehicle approaching from his rear. He believed that the vehicle was too close and opted to continue straight ahead rather than move left into the right traffic lane. He also stated that the Ford truck, which was following him, moved left from the shoulder onto the right traffic lane and into the path of the oncoming vehicle. The tractor of the oncoming combination unit struck the rear of the Ford truck in the right traffic lane.

A ladder dislodged from the Ford truck and subsequently struck the GMC straight truck. The GMC straight truck moved south-southwest about 180 feet before it came to rest on the outer embankment. Subsequent to impact with the combination unit, the Ford truck moved south-southwest about 460 feet before it came to rest in the edge of a wooded area along the west side of the highway. The combination unit veered southeast across the center median,

northbound roadway, shoulder, and roadside. It traveled about 600 feet before it came to rest on the eastern roadside. At impact, both the Ford truck and combination unit were immediately engulfed in flames that spread over a wide area.

The GMC straight truck sustained minor damage, and its driver reported minor injuries. The Ford truck sustained extensive rearend crush damage, and it was destroyed by fire. The passenger was ejected and, along with the driver, received fatal injuries. The tractor of the combination unit sustained extensive frontend crash damage, and the tractor and lead trailer were destroyed by fire. The rear trailer was substantially damaged by fire. The driver of the tractor remained in the cab and was was fatally injured. A State Medical Examiner reported that the cause of death of each of the three victims was "burns."

The Ford truck, as well as the GMC truck, was owned by a Georgia company that primarily contracts to paint bridges, overpasses, signs, etc. The company was not subject to the Federal Motor Carrier Safety Regulations (FMCSR) or to regulations as adopted by the State. The 20-year-old driver of the Ford truck was employed primarily as a painter rather than truckdriver. He had about one year of occasional experience driving the Ford truck or a similar vehicle. He possessed a valid Georgia Class 1 driver license with no restriction. No history of any traffic conviction or accident was found.

The interstate motor carrier maintained a Driver Qualification File for the GMC combination driver in accordance with Federal Motor Carrier Safety Regulations (FMCSR). At the time of the accident, the truckdriver was enroute from Forest Park, Georgia, to Tampa, Florida. There was no evidence of hours of service violations. The 42-year-old truckdriver had about 16 years experience in heavy trucks; the last three years under long-term lease to the current carrier. Limited training, orientation and inservice, had been provided to the truckdriver by the carrier. The truckdriver held a valid Georgia Class 5 driver license with no restriction. His driver history for the last three years showed one 1986 conviction for improper turning. His driver'slicense was subsequently suspended for about three months during 1987 for insurance cancellation.

This accident was not discovered by the Safety Board until about six months after it occurred. Consequently, efforts to contact the owner of the trucks and relatives of the driver of the Ford truck were unsuccessful. Evidence regarding the source of the fire was not documented by the investigating police.

Blood samples from the driver of the Ford straight truck were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained a 61 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BASES and stimulants.

Perry, Georgia
Case No. 141

Blood samples from the Ford driver were also tested at the request of the State of Georgia. This test indicated that the sample contained 0.02 percent alcohol.

Blood samples from the GMC combination driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained a 45 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for BENZOS, BASES, and stimulants.

Blood samples from the GMC combination driver were also tested at the request of the State of Georgia with negative results.

Blood samples from the driver of the GMC straight truck were tested by CHT and at the request of the State of Georgia. All tests for this driver were negative.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the failure of the driver of the Ford truck to yield to the passing combination vehicle before entering the roadway.

CASE NO.: 142

Investigation No.: DEN-88-H-TR21
Accident Location: "T" Intersection of Effingham County Roads 156 and 311, 8.3 miles south of Guyton, Georgia
Lanes: 2 lanes, undivided
Shoulders: Earthen, varying widths
Median: None
Features: Level
Date and Time: March 21, 1988, at 1:20 p.m.
Ambient Conditions: Clear and sunny
Heavy Truck Involved: 1979 Freightliner tractor in combination with a loaded 32-foot hopper trailer
Motor Carrier: David W. Reed Company
Type of Operation: Private Carrier
Size of Operation: 20 power units
Total Weight of Truck: 79,640 pounds
Total Length of Truck: 47 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1979 Freightliner tractor was pulling a high center-of-gravity four-compartment hopper trailer loaded with nonhazardous granular fertilizer westbound on Effingham County Road 156. County Road 156 ended at Effingham County Road 311, a 2-lane paved road. There was a stop sign for westbound traffic on County Road 156. A witness, another company heavy equipment operator, stated, "As the truck unit approached the "T" intersection, the driver was going too fast to stop at the stop sign and attempted to make a left turn and go south on County Road 311." During the left turn, the truck went onto the right shoulder of County Road 311 and rolled 3/4 of a turn. The truck came to rest on its left side in the ditch facing south. The witness stated that there were no signs prior to the intersection warning of the up-coming stop and intersection. However, the driver was familiar with the road, having traveled it many times over the years.

The tractor sustained substantial damage, and the trailer was destroyed. The unrestrained driver was trapped in the cab and died at the scene. No autopsy was performed. The coroner listed the official cause of death as "Blunt force trauma to head, neck, and chest." The tractor received substantial damage and the trailer was destroyed.

No postcrash inspection of the tractor was conducted by the Safety Board as it had repaired and put back into service. The trailer was not inspected as most of its workable parts had been removed.

An investigation into the truckdriver's employment history revealed that he had been hired by his present employer over thirty years ago. He had no formal truckdriving training or training from the carrier. Georgia driving records revealed that the driver had a valid Georgia Class 5 license that was renewed on September 4, 1984, and expired on September 14, 1988. There were no restrictions to the license. The record listed one speeding

Guyton, Georgia
Case No. 142

conviction for the last three years with no revocations or accidents. In addition to the three year history, the record also listed convictions for the following: Speeding on January 29, 1984, improper backing on August 22, 1981, and speeding on March 21, 1981. The National Drivers Register had no listing on the driver. An examination into the driver's activities for the 72 hours preceding the accident revealed nothing significant to the circumstance of this accident.

The carrier supplied grains and fertilizer to the surrounding farming community, and had been in business since 1951. The company was not regulated by the Interstate Commerce Commission or Georgia Public Service Commission and was not subject to the Federal Motor Carrier Safety Regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained a 12 percent saturation of carbon monoxide. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's failure to stop at the sign-controlled intersection. A contributing factor was the trailer's high center of gravity. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 143

Investigation No.: CHI-88-H-TR22
Accident Location: I-75, 1/2 mile north of Dalton, Georgia
Lanes: 6 lanes, divided
Shoulders: Right, 9 feet; left 10.5 feet; both asphalt
Median: A 21-foot gravel/earthen median
Features: Level, straight, .8 percent crown, roadway depressed below surrounding terrain
Date and Time: March 21, 1988; 1:50 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1980 GMC 2-axle tractor
Motor Carrier: Parker's Truck and Trailer Repair
Type of Operation: Common Carrier
Size of Operation: 1 power unit
Total Weight of Truck: 9,538 pounds
Total Length of Truck: 17.3 feet
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The GMC tractor (no trailer) was traveling northbound on I-75 in the right traffic lane through a construction zone 1/2 mile north of Dalton, Georgia. Witnesses reported that as the unit approached an area of traffic congestion, the unit's brakes were activated. The truck veered to the left, departed the right traffic lane, and crossed over the center lane and the newly constructed left lane while rotating about 130° counter clockwise. The unit continued across the shoulder entering the median as it rolled over onto its right side, onto its roof, then its left side. At final rest the truck tractor was on its left side in the southbound left lane facing a westerly direction. The tractor roof was crushed downward by the ground impact fatally injuring the lap belt restrained driver. The Georgia State Patrol estimated the truck's speed at 70 mph. The Whitfield coroner's report noted 300 feet of skid marks left by the truck and an estimated speed of 70 mph.

Information furnished by the carrier indicated that the truckdriver had about six years of truckdriving experience in addition to truck mechanical/building experience. The driver was hired by the carrier as a driver/mechanic. He had approximately 3 months of experience with the tractor when the accident occurred. The driver had not received formal truckdriver training; he learned by riding along with a family member who was employed as a driver. The driver's mechanical training consisted of a 1978-1979 school on construction of cement-mixer trucks. A search of the driver's license history revealed the driver was operating the truck with a valid Georgia class 2 and 5 license. A 50-state check, a NDR check, and a Georgia license abstract indicated that the driver had one valid license (Georgia) and one expired license (Tennessee). The Georgia license abstract also indicated the driver was involved in an accident in 1979 and charged with following too close. The driver had six speeding violations on record between 1980 and 1985 with speeds recorded from 15 to 22 mph over the posted limit.

Dalton, Georgia
Case No. 143

The accident vehicle was purchased used approximately 3 months (late December 1987 or January 1988) before the rollover occurred. A postcrash inspection of the vehicle by the Georgia State Patrol found no deficiencies or defects. The Safety Board's investigator did not inspect the GMC tractor as the accident occurred in March--the truck had been sold by the carrier as scrap in April, and the Safety Board's investigator was advised of the accident in August.

The carrier had been in operation for about three years. The carrier's operation consisted of picking up trailers and/or trucks for repair then returning them to their operators. The accident vehicle was used to pick up trailers in Chattanooga, Tennessee, pull them to the carrier's repair facility in Dalton, Georgia, and return them to Chattanooga when the repairs were completed. The company co-owner stated that he did not believe the company fell under Federal Motor Carrier Safety Regulations. The company did not maintain any of the required certificates, records, or files on the truck or driver.

The conditions on I-75 at the time of the accident were clear, dry, daylight, with unlimited visibility. The original two northbound traffic lanes were open to traffic with only the newly added third (left) lane blockaded. According to the local Georgia DOT engineer, the lane addition project from the Tennessee border south through Whitfield and Catoosa counties began on December 19, 1986. On the day of the accident the northbound tractor would have had to pass an illuminated information board located 1/2 mile south of the accident site advising of: lane reduction 1 mile ahead, reduction of speed to 40 mph, and a do not pass advisory. The traffic congestion/backup was approximately 1/2 mile south of the lane reduction (at the accident site), but was reportedly moving within the 10 minute time reduction travel limit.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the Toxicological protocol. CHT determined that the blood sample contained an unquantified (due to limited quantity of sample available) amount of psuedoephedrine. However, it was noted that the sample quantity was not sufficient to test for THC (marijuana), BENZOS, BASES, or anticonvulsants.

Blood samples were screened at the request of the State of Georgia for selected drugs which did not include psuedoephedrine. The blood was negative for other drugs in the protocol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's apparent disregard of multiple warning signs on his approach to the construction area. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 144

Investigation No.: ATL-88-H-TR26
Accident Location: Georgia 100, 9/10 miles south of Tallapoosa, Georgia
Lanes: 2 lanes, undivided
Shoulders: Left, 1 - 3 feet; right, 6 feet: both grassed
Median: None
Features: Ascending right curve northbound
Date and Time: March 22, 1988, 12:15 p.m.
Ambient Conditions: Daylight, sunny, and dry
Heavy Truck Involved: 1975 Peterbilt tractor in combination with a flatbed trailer carrying sheet tin coils
Motor Carrier: Hub Trucking of Wedowee
Type of Operation: Common Carrier
Size of Operation: 46 power units
Total Weight of Truck: 68,670 pounds
Total Length of Truck: 52 feet
Other Vehicle Involved: 1978 Ford Granada sedan
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 1 Other Injuries: 0

FACTUAL SUMMARY:

The northbound combination unit approached a 6° right curve on a 2 percent grade at a speed probably in excess of the posted advisory speed of 45 mph. As the driver of the truck braked and attempted to negotiate the curve, the tandem wheels of the trailer locked and the rear of the trailer moved to the left and began to roll over. Simultaneously, a southbound automobile entered the curve. The driver of a vehicle some 50 yards to the rear of the automobile stated that the auto was traveling at a speed of between 45 and 50 mph. As it moved forward into the southbound traffic lane, the truck continued to rotate counterclockwise about its longitudinal axis. Some 500 feet into the curve, the rear coil weighing approximately 20,000 pounds disengaged from the flatbed trailer and fell to the pavement of the southbound traffic lane. The coil skidded into the left side of the automobile and severed the vehicle into two pieces. The front section remained in the area of the impact, the rear section moved north before coming to rest some 58 feet away. The sole occupant of the auto was killed. Nearly on its left side, the combination unit continued forward for about 220 feet before coming to rest. Ignition occurred and fire erupted around the truck tractor. The tractor was engulfed immediately and the sole occupant died from thermal injuries. No contact occurred between the truck and automobile. Available physical evidence was not substantive enough to determine the actual speed of the truck. Following the accident, the advisory speed was changed to 35 mph.

The left side of the tractor and trailer sustained crash damage from contact with the pavement. There was no evidence of vehicle contact on the tractor or anywhere on the trailer. The tractor was destroyed by fire. Although the truckdriver was found outside the cab, it is not known if he had been restrained. An autopsy revealed that the truckdriver died from smoke inhalation.

Tallapoosa, Georgia
Case No. 144

The 53-year-old truckdriver had not received formal truckdriver training. He had driven heavy trucks for over 18 years and had been in association with this motor carrier for about 5 years. Reportedly, the driver had traversed Georgia 100 through the accident area on many occasions. He held a valid unrestricted Alabama drivers license. His previous three year driving record revealed one traffic violation. The motor carrier had qualified the driver and maintained a Driver Qualification File as required by Part 391 of the Federal Motor Carrier Safety Regulations (FMSCR). The above was with one exception, the driver had not renewed his medical certificate which had expired one month prior to the accident. There was no evidence that the driver had any incapacitating physical condition. He was in compliance with the FMSCR Hours of Service Regulations. The driver had proper rest the night before and had been driving for a total of 6 1/2 hours on the day of the accident.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the truckdriver's misjudgement of the safe operating speed for his vehicle and load on the roadway curvature. Contributing to the accident was the inappropriate advisory speed signs.

CASE NO.: 145

Investigation No.: CHI-88-H-TR23
Accident Location: Cherokee County Road 765, 7.2 miles east of Canton, Georgia
Lanes: 2 lanes, undivided
Shoulders: 11 feet, earthen, both sides
Median: None
Features: Rolling terrain, 441-foot left curve, upgrade varying from 5 to 9 percent
Date and Time: April 21, 1988, 6:30 a.m.
Ambient Conditions: Clear, dry, dawn, about 50°F
Heavy Truck Involved: 1974 International conventional tractor in combination with a flatbed trailer loaded with 32,500 pounds of caged live chickens
Motor Carrier: Tyson Foods, Inc.
Type of Operation: Private Carrier
Size of Operation: 1204 power units
Total Weight of Truck: 58,960 pounds
Total Length of Truck: 55 feet
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The International combination unit was traveling north on Cherokee County Road 765 when it entered an upgrade 441-foot long left curve. Approximately 293 feet into the curve it rolled over onto its right side and then onto its roof. At final rest, the combination unit was laying on its roof in the northbound traffic lane and shoulder facing northeast.

During the rollover sequence the tractor was destroyed. The unit's roof was crushed downward, and the unrestrained driver was fatally injured. The trailer incurred minor damage from the rollover and the load of caged chickens was scattered around the accident site.

Investigators recorded scrapes and gouges from the vehicle's rollover impact with the pavement. The markings on the road surface began 293 feet into the curve and continued north 210 feet to the unit's final rest position. All of the gouges, scrapes, and road surface markings were confined to the northbound traffic lane and shoulder.

Information furnished by the carrier indicated that the driver had approximately two years of heavy truck driving experience with the carrier and the accident unit. The driver's truckdriving training was principally obtained as a ride-along catcher during his previous four years of employment with the carrier, and from carrier-sponsored safety meetings. A search of the driver's license history revealed a valid class 5 Georgia license issued on June 5, 1985, with no suspensions/revocations, restrictions, or convictions noted. A 50-state check on the driver indicated he only possessed a Georgia driver's license. The driver was working the midnight shift (midnight to 7

Canton, Georgia
Case No. 145

a.m.) as a driver/catcher for the carrier's live haul operation. He was enroute to the processing plant approximately eight miles away when the accident occurred. The accident occurred at dawn on the fourth work day of the week, 1/2 hour before the end of the duty shift.

A postcrash inspection of the International tractor found the unit in good repair with no evidence of malfunction or defects in the truck's systems or components. The trailer was repaired by the carrier and returned to service immediately after the accident.

The carrier had been in operation for 56 years. They were audited by the Office of Motor Carriers in February 1988 and received an "unsatisfactory" compliance rating. The Cumming, Georgia, live-haul division of the carrier maintained a driver qualification file on the fatally injured driver, but failed to maintain the required time cards recording duty and driving hours for local drivers.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed of his vehicle and load on the roadway curvature. Fatigue may have contributed to his misjudgement. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 146

Investigation No.: CHI-88-H-TR24
Accident Location: State Route 17, 9/10 mile north of Clarkesville, Georgia
Lanes: 2 lanes, undivided
Shoulders: Right, 6 feet; left, 7.7 feet; both earth and gravel
Median: None
Features: 4 percent upgrade, 659-foot radius right curve
Date and Time: April 23, 1988, 5:15 p.m.
Ambient Conditions: Cloudy, dry, daylight, 50-60°F
Heavy Truck Involved: 1969 Ford C700 straight truck with a 1000 gallon tank filled with water
Motor Carrier: Davidson Well Drilling, Inc.
Type of Operation: Private Carrier
Size of Operation: 5 power units
Total Weight of Truck: 17,600 pounds
Total Length of Truck: 27 feet
Other vehicle involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Ford tanker truck was traveling northbound when it entered a 4 percent upgrade, 927 foot right curve with 659-foot radius. The tanker crossed into the southbound lane, veered to the right, and overturned onto its left side and roof. The truck bed, water tank, and bed-mounted fuel tank separated from the truck chassis during the rollover. The truck cab's roof was crushed downward 21 inches by the ground impacts. The unrestrained driver was ejected from the unit during the rollover and fatally injured.

Investigators recorded scrapes and gouges in the pavement from the truck's rollover impact with the road surface. The markings began in the center of the roadway about 640 feet into the curve and continued north for 164 feet in the northbound traffic lane before ending on the right shoulder and roadside embankment.

Information furnished by the tank truck owner and the driver's wife indicated that the driver had no previous heavy truck driving experience. The driver was an acquaintance of the truck owner and not an employee. On the accident date the driver had gone to the truck owner to borrow a pump for pumping water from a nearby creek into his newly constructed swimming pool. After talking with one of the company owners it was decided that they would each drive one of the company tanker trucks and haul clean water from Clarkesville up to the driver's farm and chicken ranch. The driver was supposed to follow the truck owner with the second tanker; however, approximately 0.9 miles north of the Clarkesville city limits the truck failed to negotiate the right curve.

Clarksville, Georgia
Case No. 146

A search of the driver's license through 50 states showed the driver possessed only one driver's license, a valid Georgia Class 1 license with no recorded convictions, suspensions, or accidents. A NDR search was negative.

The truck owner was not aware of any driver impairment prior to lending him the tanker truck. The driver's wife stated that if he had been drinking, it was after he left the house while he was picking up the water.

A postcrash inspection of the Ford tanker found only one deficiency, the mixing of tire tread designs on the right side duals of the driver axle (axle 2). The rest of the unit was in good repair with no other evidence of malfunction in the truck's systems or components.

The well drilling company had been in operation for about 15 years. The company trucks were used exclusively for well drilling, sample boring, and plumbing operations. The company's drivers are plumbers by trade, not truckdrivers. However, they are trained by the company for any truck they may operate. The fatally injured driver was not a company employee, and had not been checked out in the accident vehicle. Since the date of the accident the company has instituted a policy of only lending a vehicle out with a company driver or not lending vehicles.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the amount of blood sample submitted for testing was insufficient for testing of volatiles (alcohol), cocaine, marijuana, benzodiazepines, bases, carbon monoxide, anticonvulsants, and ibuprofen.

Blood samples from the driver were also tested at the request of the State of Georgia. This analysis indicated that the blood sample contained 0.13 percent alcohol, 60 ng/ml of cocaine, 370 ng/ml of benzoylecgonine (metabolite of cocaine). In addition a screen only test indicated the presence of THC (marijuana).

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to his use of alcohol. Other drugs, cocaine and marijuana, may have contributed to the impairment. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 147

Investigation No.: ATL-88-H-TR27
Accident Location: U.S. Highway 80, Columbus, Georgia
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left, 4 feet; both asphalt
Median: Grass, depressed, 30 feet wide
Features: At grade, tangent
Date and Time: May 31, 1988, 10:20 a.m.
Ambient Conditions: Clear, sunny, and dry
Heavy Truck Involved: 1980 Mack tractor in combination with a trailer loaded with pulpwood
Motor Carrier: E. H. Sistrunk Trucking, Inc.
Type of Operation: Common Carrier
Size of Operation: 38 power units
Total Weight of Truck: 78,000 pounds
Total Length of Truck: 55 feet
Other Vehicle(s) Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit traveled west on U.S. 80 (the Manchester Expressway) with a load of pulpwood. While proceeding along a tangent portion of the westbound two-lane roadway, the vehicle veered onto the right shoulder. It continued along the shoulder and onto the roadside for about 164 feet before striking a small tree. After striking some other small trees, the vehicle continued another 123 feet to a final rest position in a wooded area. The path of the vehicle to its final rest position was at about a 20^{0} angle to the westbound roadway. During the accident sequence, some of the pulpwood was spilled from the trailer.

The tractor sustained minor damage to its front, but none to the cab within the immediate area of the driver position. The trailer was not damaged. The unrestrained truckdriver remained in the tractor. Although no trauma was observed, he was dead at the scene.

A State medical examiner determined that the cause of death of the truckdriver was "Myocardial Failure." He found evidence in the autopsy that the heart failure was due to a pericardial tamponade, the source of which was a mature infarct of about 7-9 days duration. The medical examiner's findings included moderate to advanced coronary sclerosis.

The truckdriver had over 15 years experience in heavy trucks (log trucks) with his current employer. He had no identifiable formal training. The truckdriver had a valid Georgia Class 5 driver's license with a restriction of corrective lenses. His driver history revealed one speeding conviction in the last five years; no other traffic conviction or accident. There was no evidence of fatigue of the truckdriver, and he was in compliance with hours of service regulations.

Columbus, Georgia
Case No. 147

The motor carrier maintained a driver qualification file for the truckdriver in accordance with Federal Motor Carrier Safety Regulations (FMCSR). According to a report in the file, a doctor (family physician) certified on December 5, 1987, that the truckdriver was qualified under the regulations. Health history on the report showed "no cardiovascular disease." The examining physician noted in a remarks section that the truckdriver was in good health. The truckdriver, according to his wife, had been taking prescribed heart medication for several years. The truckdriver's medical records for the last five years, as kept by the family physician, documented a history of high blood pressure for which various drugs were prescribed.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.017 percent alcohol and an unquantified amount of salicylate (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BENZOS, BASES, and anticonvulsants.

Blood samples from the driver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the truckdriver due to cardiac failure.

CASE NO.: 148

Investigation No.: ATL-88-H-TR28
Accident Location: Georgia 1, 2.5 miles south of Attapulgus, Georgia
Lanes: 2 lanes, undivided
Shoulders: Both sides 8 feet, grass
Median: None
Features: Downgrade, left curve
Date and Time: June 7, 1988; 11:15 p.m.
Ambient Conditions: Darkness; cloudy and dry
Heavy Truck Involved: 1981 Freightliner tractor in combination with a trailer loaded with lumber
Motor Carrier: Reynolds Trucking Company
Type of Operation: Common Carrier
Size of Operation: 30 power units
Total Weight of Truck: 80,000 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 2
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was traveling south on Georgia 1. The driver was accompanied by two passengers, one in the right front and one in the sleeper berth. The vehicle entered a long three degree left curve where the grade descends at five percent into a sag vertical curve. In the descending left curve, the vehicle ran off the roadway onto the right shoulder. Within the sag vertical curve, the driver attempted to steer back onto the roadway, but the vehicle moved farther onto the right shoulder and into a ditch. It continued along the ditch and overturned to the left about 275 feet from where it left the roadway. The vehicle skidded about 150 feet on its left side along the ditch and shoulder and came to a final rest position facing a south-southeasterly direction.

The left side of the tractor cab was crushed, with considerable intrusion into the driver area. The truckdriver was trapped in the cab and killed. Both passengers remained in the vehicle; they reported minor injuries. It was not determined whether the driver and the right front seat passenger were restrained with available lapbelts.

The 50-year-old truckdriver had about 24 years experience in heavy trucks. He had been operating under a long-term lease to the carrier for a little over two months and was enroute from Birmingham, Alabama, to Tampa, Florida. The carrier had provided no driver training, and no previous training could be documented. The truckdriver had a current Alabama operator license with no restriction. His driving record for the last five years showed one speeding conviction and no accidents.

The interstate motor carrier maintained an incomplete driver qualification file for the truckdriver. The file included a current medical

certificate. Hours of service were estimated from a combination of daily logs (no logs for last five days), trip tickets, and miles driven. The various records revealed no evidence of driver impairment or fatigue, and he was in compliance with hours of service regulations.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.04 percent alcohol and 200 ng/ml of ephedrine. No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BASES.

Blood samples from the truckdriver were also tested at the request of the State of Georgia. This test indicated that the blood sample contained 0.09 percent alcohol.

The Georgia laboratory tested the blood for alcohol--no other drug testing was requested. The explanation for the significant difference in blood alcohol levels could not be established. However, the specimens were about 2 months old before they were shipped to the Center for Human Toxicology.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to alcohol.

CASE NO.: 149

Investigation No.: NYC-88-H-TR18
Accident Location: Route 197, Mitchell County, North Carolina
Lanes: 2 lanes, undivided
Shoulders: None
Median: None
Features: 1 percent upgrade, occasional curves
Date and Time: August 10, 1988, 11:58 a.m.
Ambient Conditions: Clear, dry, 90°F
Heavy Truck Involved: 1979 Kenworth COE 3-axle tractor in combination with a 36-foot logging trailer
Motor Carrier: Richard Nelon
Type of Operation: Common Carrier
Size of Operation: 2 power units
Total Weight of Truck: 76,000 pounds (approximate)
Total Length of Truck: 47 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Kenworth combination unit was traveling south when it traveled off of the right side of the paved highway and overturned 90° onto its right side as it went down a steep embankment adjacent to the roadway. A witness stated that the Kenworth moved rightward to make room for a truck approaching from the opposite direction when the truck's right tires went off the roadway and the truck went down the embankment. There were no shoulders on either side of the roadway at the accident site. The area adjacent to the roadway where the truck ran off was sloped downward at a 33 percent grade; a small section of the pavement edge was collapsed in this area. The speed limit for this highway was unposted at 55 mph. The driver had entered the highway .28 miles south of the accident site--post accident inspection of the truck revealed that it was in 4th gear low when the crash occurred. Calculations indicated that the maximum speed that the truck could attain in 4th gear low was 16.35 mph.

The tractor and trailer received only minor damage as a result of the crash. The unrestrained 66-year-old driver was fatally injured.

The truckdriver reportedly had at least 24 years of experience in heavy vehicle operation. However, all of his experience was with tanker trucks and he had no formal training in truck operations. The driver had been operating a tractor in combination with a log trailer for about 2 weeks, and had been employed by the motor carrier for the same period of time. The driver was reportedly familiar with the highway where the crash occurred.

The motor carrier was not in compliance with North Carolina's adoption of the Federal Motor Carrier Safety Regulations. He did not have personnel or maintenance records, did not maintain any driver logs, and failed to qualify his driver with a medical examination or background check.

Mitchell County, North Carolina
Case No. 149

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the available lane width which resulted in the right side tires travelling onto the soft shoulder. Contributing to the severity of the accident was the driver's failure to use the available restraint.

CASE NO.: 150

Investigation No.: ATL-88-H-TR29
Accident Location: Georgia 18, 1.1 mile east of Pine Mountain, Georgia
Lanes: 2 lanes, undivided
Shoulders: Both, 6 feet wide, dirt and gravel
Median: None
Features: At grade, downgrade, right curve
Date and Time: August 11, 1988, 10:15 p.m.
Ambient Conditions: Darkness, clear, and dry
Heavy Truck Involved: 1969 White tractor in combination with a loaded log trailer
Motor Carrier: James O. Arms
Type of Operation: Common Carrier
Size of Operation: 4 power units
Total Weight of Truck: 74,000 pounds
Total Length of Truck: 53 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit traveled east on Georgia 18. While proceeding through a three percent downgrade, 650-foot radius right curve, the vehicle began to overturn counterclockwise about its longitudinal axis. The overturning truck crossed the westbound traffic lane and shoulder, crashed through a farm fence, and came to rest in a field on the west side of the highway. At rest, the log truck was on its top about 310 feet from where it began to overturn in the right curve. Some of the logs impacted and came to rest on the tractor.

The tractor was substantially damaged. The left fender, hood, and cab were deformed downward and rearward, and the rear of the cab was deformed forward. With deformation of the cab from both front and rear, the driver area was destroyed. The unrestrained truckdriver was trapped in the tractor and killed. The trailer sustained minor damage.

The 24-year-old truckdriver reportedly had about one year experience in smaller trucks. He had no experience in a combination unit before his current employment, nor had he participated in formal truckdriver training. He was on his fourth day of driving the combination unit at the time of the accident. The truckdriver held a valid Georgia Class 1/2 driver's license with no restriction. A Georgia Class 1/2 driver's license authorizes a person to operate only automobiles, certain other smaller vehicles, and motorcycles. The driver history for the truckdriver showed one speeding conviction and no accidents in the last three years. A nine-year history showed 13 convictions for hazardous traffic violations.

Pine Mountain, Georgia
Case No. 150

The intrastate motor carrier, a logging contractor, was exempt from Federal Motor Carrier Safety Regulations (FMCSR) as adopted in large part by Georgia. The carrier had employed the truckdriver on Monday before the Thursday accident. According to the carrier, the truckdriver began his employment by driving one 60-mile round trip in the accident vehicle, following another log truck being driven by the carrier/owner. The carrier stated that he gave the truckdriver several instructions, one of which was a specific warning about the hazardous accident curve. The carrier acknowledged that he accepted the truckdriver's response that he was properly licensed for the log truck and did not check his driver's license.

On the fourth roundtrip of the day, the truckdriver was within about five mile of his destination when the accident occurred. On the three previous days, he had made no more than three roundtrips per day. The carrier stated that earlier in the afternoon before the accident he had instructed the truckdriver not to try and make the fourth roundtrip. Contrary to those instructions, he was making the fourth trip. The truckdriver was being paid a fixed rate per ton/mile.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1 ng/ml of the psychoactive component of marijuana (THC), 30 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 1,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples were also tested at the request of the State of Georgia. This screening test indicated the presence of marijuana.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the impairment of the truckdriver due to the combined effects of fatigue and his use of marijuana. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 151

Investigation No.: NYC-88-H-TR19
Accident Location: Interstate 295, Milepost 26.2, Bellmawr, New Jersey
Lanes: 6 lanes, divided
Shoulders: Right, 12 feet, asphalt; left, none
Median: Grass, 30 feet wide
Features: at grade
Date and Time: August 12, 1988, 8:34 a.m.
Ambient Conditions: Daylight, clear, and dry
Heavy Truck Involved: 1970 Ford model 600, dump-body truck
Motor Carrier: John W. Young
Type of Operation: Owner-operator
Size of Operation: 1 straight truck
Total Weight of Truck: unknown, (GVWR 27,500 pounds)
Total Length of Truck: 22 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The empty Ford dump-body truck was southbound on Interstate 295 approaching milepost 26.2 when, according to witnesses, the truck drifted right, off the highway, and glanced off several trees. The truck continued southbound and struck a "W-beam" guardrail in several places before coming to rest on the shoulder against a guardrail. The witnesses stated they saw no brake lights come on during the crash. The truck traveled about 892 feet from the area of contact with the trees to the point of final rest. The roadway was straight in the area of the crash and there were no precollision brake marks located at the scene. A postcrash inspection of the vehicle failed to reveal any mechanical discrepancies.

Witnesses reported that the driver was lying across the seat following the crash, with his legs still under the steering wheel. He was not wearing a seatbelt. A postmortem examination revealed that the unrestrained driver had a history of heart disease and had died as a result of hypertensive heart disease. The drivers' wife related that she had no knowledge of her husband's heart disease. She had seen him several hours earlier and he did not appear ill. She stated that her husband would pick up junk at various places and take the junk to a drop off point somewhere near Camden, New Jersey. She further stated that her husband had been a junkman all his life and worked several days a week.

Blood samples from the driver were not sent to the Center for Human Toxicology. However, blood samples from the driver were tested at the request of the State of New Jersey with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the driver due to cardiac failure.

CASE NO.: 152

Investigation No.: SEA-88-H-1R17
Accident Location: Interstate 5, 1.5 miles south of Lathrop, California
Lanes: 6 lanes, divided
Shoulders: Right, 5 feet; left, 9 feet; both asphalt
Median: 40 feet, dirt and grass
Features: At grade, curve, 4 percent upgrade
Date and Time: August 13, 1988; 11:07 p.m.
Ambient Conditions: Clear, dark, dry, and 60°F
Heavy Truck Involved: 1972 White Freightliner COE tractor in combination with two loaded 24-foot bin trailers
Motor Carrier: Broadway Transportation Co., Inc.
Type of Operation: Contract Carrier
Size of Operation: 52 power units
Total Weight of Truck: 75,320 pounds
Total Length of Truck: 60.6 feet
Other Vehicle Involved: 1972 White Freightliner COE tractor in combination with two loaded 24-foot sugar beet trailers
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1972 White Freightliner pulling two full trailers of tomatoes had just entered a curve to the right in the southbound lanes of Interstate 5. Another 1972 White Freightliner in combination with two trailers loaded with sugar beets was also traveling southbound, and was ahead of the tomato truck. The driver of the sugar beet truck stated that he heard his tire blow, turned on this emergency flashers, and began to pull off the roadway. As he was slowing down, the tomato truck struck the rear of the second sugar beet trailer. The driver of the sugar beet truck stated that he was traveling 40 mph at the time of the collision; however, a witness estimated his speed at about 10 mph. When the trucks came to rest, they were both in the outside lane of travel, with the sugar beet truck about 120 feet ahead of the tomato truck. One tire mark was found about 46 feet long, then 71 feet south of the end of the tire mark, gouges were noted in the concrete road surface. The unrestrained driver of the tomato truck was found inside the cab which was located about 13 feet in front of the tractor chassis, buried under about four feet of tomatoes. The tachograph from a truck passing the tomato truck showed a speed of 55 mph just before the impact.

The passenger compartment and engine from the tomato hauler was found in front of, and completely separated from, the chassis. Deformation on the cab was rearward on the front, and toward the front on the back sections. Two 3/8 inch steel wire cables secured each fiberglass bin of tomatoes--all four cables were found broken. No damage was reported to the 1972 White Freightliner pulling the sugar beet trailers, and only minor damage was found on both of the trailers.

The driver of the tomato truck had been on duty 96 hours and 35 minutes in the last 8 days; 12 hours, and 25 minutes the day before the accident. The

Lathrop, California
Case No. 152

State of California did not limit the on-duty time for intrastate drivers. This driver had been off duty for 13 hours and 5 minutes before he began work the day of the accident, and had been at work for 4 hours and 40 minutes when the collision occurred.

The witness who had followed the tomato truck for about a quarter mile and had begun to pass, stated that he had noticed no unusual driving. The driver of the truck passing the tomato truck stated that he did not believe the sugar beet truck had any of its lights on. The responding officer from the California Highway Patrol said that the running lights and the emergency flashers on the left side of the rear trailer were on when he arrived at the scene. After examining the tail lamps from the rear sugar beet trailer, the California Department of Justice, Bureau of Forensic Services, laboratory concluded that the left side lamps showed evidence of the running lights being on at the time of the collision.

The driver of the tomato truck possessed a valid class 1 driver's license. He had one violation (for exceeding maximum weight), and no accidents in the last three years. He had eight months of experience driving heavy trucks and had completed a four week course in the operation of heavy trucks. The driver of the sugar beet truck had seven violations (3 for speeding) and had been involved in one accident in the last three years.

Blood samples from the fatally injured truckdriver were sent to the center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the fatally injured truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the tomato truck driver due to fatigue. Contributing to the accident was the slow speed of the sugar beet truck.

CASE NO.: 153

Investigation No.: MKC-88-H-TR18
Accident Location: Beauty Hill Road, 10 miles north of Adamsville, Tennessee
Lanes: 2 lanes, undivided
Shoulders: None
Median: None
Features: Straight, at grade
Date and Time: April 23, 1988, 12:01 a.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1980 Dodge D-500
Motor Carrier: Private party (non-motor carrier)
Type of Operation: Farming
Size of Operation: 1 truck
Total Weight of Truck: 7,800 pounds
Total Length of Truck: Unknown
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Dodge truck was westbound on the straight roadway when it went off the left side of the roadway into a 3-foot wide ditch, then continued 100 feet into a field where it came to rest on its wheels. The hood latch came loose, allowing the hood to come up over the windshield. The driver, at some point during the accident sequence, fell or jumped out of the vehicle and was run over by the wheels of the truck.

The truck sustained only minor damage when the hood came up over the windshield. The unrestrained driver was fatally injured when he was run over by the vehicle.

This driver was a farmer and was utilizing the truck for transportation. He was not a commercial truckdriver; consequently, he was not governed by the Federal Motor Carrier Safety Regulations concerning driver logs and hours of service. He had received two speeding citations, one in 1984 and one in 1985, and had been involved in a minor property damage accident in 1980.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.30 percent alcohol and 1,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of Tennessee. This test indicated that the blood sample contained 0.26 percent alcohol. The Tennessee report of traffic accident indicates only that the driver had been drinking; the report does not reflect the results of toxicology testing.

Adamsville, Tennessee
Case No. 153

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the driver due to alcohol.

CASE NO.: 154

Investigation No.: MKC-88-H-TR19
Accident Location: I-55 at South Parkway, Memphis, Tennessee
Lanes: 6 lanes, divided
Shoulders: Right, 10 feet; left, 5 feet; both asphalt
Median: 2 feet wide, 32-inch high concrete barrier.
Features: Straight, at grade, interchange area
Date and Time: April 25, 1988; 11:20 a.m.
Ambient Conditions: Cloudy and dry
Heavy Truck Involved: 1978 Ford tractor in combination with a 28-foot trailer
Motor Carrier: P.I.E. Nationwide, Inc.
Type of Operation: Common Carrier
Size of Operation: 4,175 power units
Total Weight of Truck: 24,100 pounds
Total Length of Truck: 38 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Ford combination was traveling northbound on Interstate 55 when it departed the right shoulder and struck a post mounted "W-beam" guardrail with the left front of the tractor. It continued up the grassy embankment for approximately 200 feet to South Parkway where it struck a "No Parking" sign, then traveled for approximately 100 feet across South Parkway onto Riverside Drive where it struck two utility poles before coming rest upright next to the east curb of Riverside Drive.

All of the objects struck by this vehicle were contacted by the front area of the tractor. Therefore, the moderate damage that the combination unit sustained was confined to the front of the unit. Although the driver received serious injuries from the accident, the medical examiner listed the cause of death as natural (cardiac arrest). The police listed restraint use as unknown and the NTSB was unable to locate any emergency response personnel that knew if the driver was wearing a seatbelt.

This driver had been operating commercial vehicles for almost 33 years, but had received no formal training. He had been driving vehicles of the accident type for about 30 years. On July 8, 1981, he received a 22-year safe driving award and had since received a 25 and 26 year safe driving award. The driver had no violation history. His only accidents were two minor property damage accidents; one in 1976 and one in 1978. He was, however, involved in an accident on June 10, 1987, in his private automobile where another automobile failed to stop and ran into his car. A 50-state driver's record check and a NDR check revealed no additional driver's licenses or records on this individual.

Memphis, Tennessee
Case No. 154

The parent company, I U International, merged two of its individual companies to form Ryder/PIE Nationwide in July of 1983, with headquarters in Jacksonville, Florida. In the United States, Ryder/PIE has over 200 terminals and operates 28 shops, where its vehicles and equipment receive periodic maintenance and inspections. The maintenance records are centralized at the Jacksonville headquarters. The Safety and Security Department Director provides driver training through six Safety Supervisors at various locations throughout the United States.

Blood samples from this truckdriver were not sent to the Center for Human Toxicology. However, samples were tested at the request of the State of Tennessee. This screening test indicated that the blood sample contained unquantified amounts of caffeine and lidocaine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the driver due to cardiac failure.

CASE NO.: 155

Investigation No.: MKC-88-H-TR20
Accident Location: U.S. 127, 4 miles south of Dunlap, Tennessee
Lanes: 2 lanes, undivided
Shoulders: Grass, varying widths
Median: None
Features: 8 percent downgrade, winding, mountainous
Date and Time: May 12, 1988, 12:40 p.m.
Ambient Conditions: Clear, daylight, road dry, 92°F
Heavy Truck Involve: 1977 Kenworth COE tractor in combination with a loaded 45-foot van trailer
Motor Carrier: Bryan Truck Line, Inc.
Type of Operation: Common Carrier
Size of Operation: 95 power units
Total Weight of Truck: 81,080 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination unit was traversing a mountainous downgrade of 8 percent with 51,430 pounds of tomatoes in the trailer. As it approached a curve to the right, the vehicle left the roadway and travelled 193 feet up a private driveway on an 18 percent upgrade. It then went into a ditch, up an embankment for 54 feet, and into the woods. The vehicle came to rest on its side approximately 190 feet from the area where it left the driveway. The Safety Board investigation found 10 warning signs, starting two miles before the accident site, warning motorists of the impending curve. The curve was so well known that the Dunlap Lions Club put up its own warning sign, warning motorists of the impending danger and telling truckers to shift to lower gears.

The collision resulted in substantial damage to both the power unit and trailer of the combination vehicle. The driver of the truck was ejected from the cab and fatally injured.

The driver had worked for this company from January 1983 until January 1985, then left to go to work for another trucking company. He came back to the carrier in March 1988. At the time of his re-employment, the company required the driver to fill out a new application for employment, but did not require him to take a new written examination or road test. The carrier did not inquire into the driver's driving record or inquire into the driver's past employment record. The safety officer for the carrier said that they knew they were supposed to give the driver a written examination and a road test, along with inquiring into the driver's past employment and driving record, but, since the driver formerly worked for them, he did not think that it was necessary because they had his old file with all of the information. This driver had received no formal heavy truck training from his employers. The

driver had a valid Ohio chauffeur's license with a motorcycle license endorsement. A driver's license record check from Ohio indicated that the driver had three speeding violations, one failure to yield right-of-way violation, and two accidents since June 1982. A 50-state driver's license check indicated that the driver's license was suspended in New York.

The driver's daily logs were checked from April 23, 1988, until May 12, 1988. On May 9, the driver logs indicated that he drove 114 miles in 1.5 hours for an average speed of 76 mph. On May 10, his logs indicated that he drove 372 miles in five hours for an average speed of 74 mph. On May 11, the driver's logs indicated that the driver drove 239 miles in three hours for an average speed of 79 mph, and, on the same day the driver logs indicate that the driver drove 240 miles in three hours for an average speed of 80 mph on a separate segment of the trip.

The investigation revealed that the driver received an overweight assessment citation on I-75 in Valdosta, Georgia, at 5:11 a.m. on May 12, 1988, 6.5 hours before the accident.

At the time of the accident, the signing on the truck's door still listed Cal's Trucking, Inc. out of Lima, Ohio. The signing for Bryan Truck Line, Inc. was found in the driver's luggage.

Urine samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the urine sample contained greater than 10,000 ng/ml of methamphetamine, 2,700 ng/ml of amphetamine, and an unquantified amount of salicylate (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified.

In addition, several pills which were found in the driver's pocket were also sent to the CHT for drug identification. The CHT analysis determined that the pills contained psuedoephedrine and caffeine.

Urine samples from the truckdriver were also tested for alcohol at the request of the State of Tennessee with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's apparent disregard of multiple warning signs on his approach to the curve, The driver's use of drugs, amphetamine and/or methamphetamine, probably contributed to the accident.

CASE NO.: 156

Investigation No.: DEN-88-H-TR22
Accident Location: State Road 180, 3 miles west of Kerman, California
Lanes: 2 lanes, undivided
Shoulders: Right, 8 feet; Left, 10 feet; both earthen
Median: None
Features: At grade
Date and Time: August 16, 1988, 8:30 a.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: (1) 1976 International tractor
Motor Carrier: Yepez Trucking
Type of Operation: Common Carrier
Size of Operation: 2 power units
Heavy Truck Involved: (2) 1979 Kenworth tractor in combination with a loaded 40-foot flatbed trailer
Motor Carrier: Gonzalez and Son Trucking Company
Type of Operation: Common Carrier
Size of Operation: 4 power units
Total Weight of Truck(s): (1) 13,310 pounds (2) 79,500 pounds (approximate)
Total Length of Truck(s): (1) 18 feet (approximate) (2) 55 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 2 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1976 International tractor was traveling east on California State Road 180 at a witness estimated speed of 50 mph. At a point 8/10 of a mile west of the intersection with Lake Avenue, the international crossed the center line and struck the 1979 Kenworth combination headon. The point of impact was located 2.5 feet south of the north edge of the road in the westbound lane. There were no visible skidmarks left by either vehicle before the point of impact. The impact resulted in general disintegration of the International tractor, with the largest section, the frame and rear axle, traveling in an easterly direction for 30 feet before coming to rest facing south with the rear wheels nine feet south of the north edge of the road. After impact, the Kenworth combination traveled in a westerly direction for 130 feet, leaving scrape, gouge, and skidmarks in the westbound traffic lane. This vehicle came to rest with the tractor on its right side, facing southwest, with the right front wheel 130 feet west of the point of impact and about 4.5 feet south of the north edge of the road. The trailer, still attached, remained upright and came to rest on the north shoulder with the left rear wheel 45 feet west of the point of impact and 2 feet north of the north edge of the road.

The unrestrained driver of the International was ejected during the accident sequence and fatally injured. The restrained driver of the Kenworth was entrapped in the wreckage of his tractor and also received fatal injuries. The Kenworth tractor received heavy front and left side damage. The trailer received moderate damage to the left front.

Kerman, California
Case No. 156

The driver of the International had 12 years of heavy truck driving experience at the time of the accident. He had been the owner of the company for 10 years. There was no record of any formal training. A three year check of his driving record revealed no traffic violations or accidents. He held a valid Arizona driver's license.

The driver of the Kenworth had been employed by his carrier for six years. He had received his training from friends and relatives in the accident type vehicle. A three year check of his driving record revealed no traffic violations or accidents.

No postaccident equipment evaluation was conducted on the International due to the general disintegration. The carrier could not produce a driver's qualification file, log sheets for the driver, or vehicle maintenance records. Although it was determined that this carrier was subject to the FMCSR, there was no record of the carrier being audited for safety compliance.

The tractor brakes on the Kenworth combination had been backed off by the wrecker driver and, therefor, were not tested. The trailer brakes were tested and were within the limits set by Federal Motor Carrier Safety Regulations. The log book for the driver was incomplete for the 15 days prior to the accident. The owner/operator of the Kenworth was regulated by the California State PUC, but the carrier could not produce maintenance records or driver's qualification records. There was no record of a safety compliance audit for this carrier.

Blood samples from the driver of the International were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver of the International were also tested at the request of the State of California with negative results.

Blood samples from the driver of the Kenworth were sent to the CHT for testing. CHT determined that this driver's blood contained 1,000 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Kenworth driver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the International driver's failure, for unknown reasons, to maintain his vehicle in the proper travel lane.

CASE NO.: 157

Investigation No.: LAX-88-H-TR20
Accident Location: Interstate 10, near Blythe, California
Lanes: 4 lanes, divided
Shoulders: Right, 8 feet; left, 5 feet; both asphalt
Median: 30 - 40-foot dirt median
Features: At grade, 1.5 percent upgrade, straight,
Date and Time: August 18, 1988, 3 a.m.
Ambient Conditions: Dark, unlighted, cloudy, dry
Heavy Truck Involved: 1988 Peterbilt conventional tractor in combination with a partially loaded refrigerator trailer
Motor Carrier: FFE Enterprises
Type of Operation: Common Carrier
Size of Operation: 970 power units
Total Weight of Truck: 66,500 pounds
Total Length of Truck: 60 feet
Other Vehicle Involved: 1987 Kenworth conventional tractor in combination with 2 fully loaded 27-foot van trailers
Truck Fatalities: 2 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Peterbilt combination unit was eastbound in the E-2 (slow) lane of an interstate highway, transecting a dark, unlighted portion of the inland desert at a witness reported speed of 55 to 60 mph. As the vehicle passed under the Wiley Wells overcrossing, it approached a slower moving unit in the same lane--a Kenworth combination unit had been stopped along the road and was attempting to reenter traffic. Witnesses reported that the Kenworth combination unit had its taillights on. The driver reported that he was in 7th gear and was probably traveling approximately 40-45 mph when he was struck from the rear by the Peterbilt. There were no precrash skidmarks or other evidence of evasive maneuvers. After the impact, the Peterbilt unit travelled east for an additional 220 feet while rotating approximately 40° to the right. The vehicle came to rest upright, off the right road edge. The Kenworth unit continued for approximately 475 feet until it drifted approximately 15° to the right and left the right road edge. A postcrash examination of the Peterbilt truck indicated no apparent preexisting defects. At impact, the 5th wheel assembly failed at the adjustment track, allowing the refrigeration unit from the trailer to impact and penetrate the rear of the sleeper unit of the truck. A postcrash examination of the Kenworth truck revealed that the taillights and rear clearance lights had been operational precrash.

The overall deformation of the Peterbilt cab significantly reduced the overall length of the cab. Although the Jaws-of-Life were used to extricate the occupants and significant deformation of the damage was noted, areas of crush indicated a maximum deformation which reduced the distance between the grill on the front of the conventional unit to the rear of the sleeper to 31 inches at the greatest area of deformation. The trailer sustained major undercarriage deformation and damage to the landing gear. In addition, the refrigeration unit was damaged and rendered inoperable. The trailer was

hooked to another tractor and driven from the scene. The unrestrained driver sustained a non-fatal partial foot amputation and succumbed to exsanguination. The codriver, unrestrained in the sleeper unit, sustained a fatal head injury. The rear trailer of the Peterbilt combination unit sustained total damage, with significant rear damage and a collapse of the structure of the front of the trailer. The tow bar deformed downward and the converter dolly was severely damaged. The front trailer of the Peterbilt sustained major damage to the rear door, but remained attached to the tractor. The tractor was undamaged and they were driven from the scene. The lapbelted Kenworth driver refused initial medical aid, but was later transported with complaints of pain. His codriver, unrestrained and asleep in the sleeper unit, was not injured.

The Peterbilt driver had been with the company for more than 16 years and was familiar with this route. Although log books for the four days prior to the accident were blank, another company driver related that he had been driving ahead of this unit and had left the motel at approximately the same time, 5 hours precrash. Motor vehicle records indicated that he had 4 speeding violations and 1 accident in the last 5 years. There was no evidence of prior debilitation, fatigue, or inattention on the part of the driver, and no evidence of any evasive maneuvers attempted precrash. The Kenworth driver related that he had pulled off the road to retrieve some cassette tapes. It should be noted that this accident occurred approximately 3 miles beyond a reststop offramp.

Blood samples from the Peterbilt driver were not sent to the Center for Human Toxicology. However, blood samples from the driver were tested at the request of the State of California with negative results.

Blood samples from the Kenworth driver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the Peterbilt driver to perceive and react to the slow moving Kenworth combination. Contributing to the accident was the poor conspicuity of the Kenworth's rearmost trailer.

CASE NO.: 158

Investigation No.: NYC-88-H-TR21
Accident Location: Interstate 95 (Capitol Beltway), at the Branch Avenue Interchange, north of Camp Springs, Maryland
Lanes: 8 lanes, divided
Shoulders: Both, 1.5 feet, paved, adjacent to bridge rail
Median: Open median to roadway below (on overpass)
Features: Bridge overpass, straight
Date and Time: August 19, 1988, 6:20 a.m.
Ambient Conditions: Overcast, dawn, wet roadway, 80°F
Heavy Truck Involved: 1988 Ford F-900 2-axle straight truck (concrete pump)
Motor Carrier: Sylvan Pools Inc.
Type of Operation: Pool Construction Contractor
Size of Operation: 1 tractor, 49 straight trucks
Total Weight of Truck: 28,000 pounds (approximate)
Total Length of Truck: 28 feet
Other Vehicles Involved: 1987 Kenworth tractor in combination with a car carrier trailer and a 1986 Toyota pickup truck

Truck Fatalities: 1 Truck Injuries: 1
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The Ford truck was traveling southbound in the third lane of Interstate 95 near Camp Springs, Maryland. As the truck approached the overpass and interchange with Maryland Route 5, it was struck in the right front by the left rear of a 1987 Kenworth tractor in combination with a car carrier trailer. The Ford swerved leftward across the fourth lane and struck a concrete bridge rail. A 1986 Toyota pickup that was southbound in the fourth lane then collided with the left rear of the Ford. Following the collision with the pickup, the Ford overturned 270° in the fourth lane. A fire ensued that engulfed the Ford and eventually spread to the disabled pickup. Witness statements indicated that an unknown passenger car entering the highway suddenly moved from the Branch Avenue entrance ramp into the first southbound lane in front of a 1979 Mack tractor pulling a Fruehauf trailer. The Mack combination unit swerved into the second lane to avoid a collision with the passenger car, and the Kenworth combination in the second lane was then forced to swerve into the third lane to avoid a collision with the Mack combination. The Kenworth then collided with the Ford. At the time of the collision the Ford was occupied by the driver and a passenger. The unrestrained passenger was able to escape from the wreckage following the collision and received moderate injuries. The unrestrained driver was trapped within his vehicle and received fatal fire-induced injuries. The pickup driver received minor injuries and the Kenworth driver was not injured. The passenger car driver stopped her vehicle after the crash but then fled the accident site.

The speed limit for the highway was 55 mph, and witnesses estimated the Ford's speed at 50 to 55 mph. An inspection of the vehicle revealed that there were no preexisting mechanical deficiencies that would have influenced this crash. There were no tire braking marks located at the accident site, and

there were no marks that indicated a sudden steering maneuver by the Ford driver prior to the collision with the Kenworth. The Ford's front axle was found on Branch Avenue after the crash, underneath the median opening at the I-95 overpass. Gouge marks were located in the fourth lane approximately 50 feet north of the truck's final rest position, and the highway pavement surrounding the truck and along the bridge railing curb was burned. The Ford was completely destroyed by fire and received contact damage across the entire front of the truck. The cab roof was buckled and the doors were crushed and inoperable. The left side fuel tank on the truck was scraped and torn open at the left side and left front corner.

The driver was familiar with the highway on which the accident occurred. Although the driver had a license enabling him to drive articulated vehicles, he had not driven any trucks heavier than the accident vehicle. The driver was a mason by trade and employment, and was not a professional truckdriver. He drove the truck incidental to his job as a pool mason, and had operated similar vehicles for this company for over 10 years. He had no recent accidents or violations. The company had not provided the driver with training.

Blood samples from the Ford driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 6,400 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood and urine samples from the Ford driver were also tested at the request of the State of Maryland. Tests of the driver's blood indicated a 12 percent saturation of carbon monoxide and an unquantified amount of quinine. Tests of the urine revealed unquantified amounts of acetaminophen (analgesic) and quinine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the improper lane change made by the non-contact vehicle.

CASE NO.: 159

Investigation No.: SEA-88-H-TR18
Accident Location: 11th Street on-ramp to I-5 NB, near Tracy, California
Lanes: 2 lanes (one way on-ramp)
Shoulders: Right, 8 feet; left, 5 feet; both asphalt
Median: None
Features: Right curve, 3 percent superelevation, 4.5 percent downgrade (maximum)
Date and Time: August 22, 1988, 4:45 p.m.
Ambient Conditions: Daylight, sunny, clear
Heavy Truck Involved: 1966 White Freightliner COE tractor
Motor Carrier: Broadway Transportation Company, Inc.
Type of Operation: Contract Carrier
Size of Operation: 52 power units
Total Weight of Truck: 11,000 pounds (approximate)
Total Length of Truck: 14 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

This accident occurred as the tractor was traveling eastbound on the 11th Street entrance ramp intending to enter Interstate 5 northbound. Two witnesses following the tractor related that they were traveling between 50-55 mph. The tractor crossed over Interstate 5 and then started around a 1,000 foot radius left curve, traveling downhill toward the merging interstate highway. After traveling about 500 feet beyond the bridge, the truck drifted to the left, onto the asphalt berm, and struck a 6 inch high asphalt curb. It went over the curb, onto the gravel berm, and then down a steep embankment into a level grassy field. The truck then went to the right, rotated approximately 1/4 turn clockwise, and rolled over one complete turn. The driver was ejected in the process. The tractor came to rest upright, facing east, 50 feet west of the 11th Street entrance ramp. The driver came to rest about 15 feet south of the tractor.

The tractor was equipped with a lapbelt that was not being worn. The driver was pronounced dead at the scene. The cause of death was listed by the coroner as a "Ruptured Aorta and Lacerated Liver." The driver also sustained multiple rib fractures.

The tractor roof was crushed to the approximate level of the steering wheel. A postaccident inspection of the tractor, with particular attention given to the steering, failed to reveal mechanical defects. This inspection was conducted with the assistance of a Commercial Vehicle Enforcement Officer from the California Highway Patrol.

On August 22, the driver reported for work at the Stockton terminal at about 5:30 a.m. He departed the terminal at 5:45 a.m. His driving consisted of hauling tomatoes from local agricultural areas to food processing plants.

Tracy, California
Case No. 159

On his last trip, he departed Woodland, California, about 1:15 p.m. enroute to the H.J. Heinz plant in Tracy. California, a distance of approximately 80 miles. At 2:15 p.m., he was involved in a rear end collision on Interstate 5 about 10 miles south of Sacramento. According to the police report, there was moderate damage to a utility trailer being pulled by a car, and minor damage to the truck tractor. The police report also stated that the truckdriver was to have a complaint filed against him for driving at an "Unsafe Speed for Conditions." The State Patrolman and car operator (the party struck from behind) were interviewed by the Safety Board investigator--neither of them observed the truckdriver to be impaired. The driver continued his trip to Tracy and dropped off 2 loaded trailers at the H.J. Heinz plant. He departed there at about 4:40 p.m., and had the accident about 5 minutes later. During the previous 21 days, he had driven a total of 157.75 hours and had a total on-duty time of 218.5 hours. During that period, he did not have a full day (24 hour period) off.

The driver was hired by this carrier on July 8, 1988, and had worked for the carrier for about 6 weeks when the accident occurred. He had about 25 years experience driving trucks and at least 5 years pulling double trailers. The dispatcher related that he did not receive training from the carrier, but was given a road test and performed adequately. The dispatcher also related that he inquired with 2 previous employers, and a couple of drivers (from this carrier) who knew him, and everything checked out all right. The driver listed 5 previous employers on his application; two had gone out of business and one could not be located. The remaining two were Shawver Trucking Company, for which the driver noted that he left for "personal reasons," and for Kooyman Trucking, for which he noted that he "quit." An inquiry with the dispatcher at Kooyman Trucking revealed that he was a good employee, but "he could not take the grind of day to day operations, was late for work a few times, and eventually quit." During a further inquiry with the executive office at Kooyman Trucking, documentation was shown to the Safety Board investigator that revealed he had been "dismissed." An inquiry at Shawver Trucking revealed that he did quit, but would have been dismissed for irresponsible behavior if he had not.

During the course of the investigation, a 3rd previous employer, BJJ Company, Inc., was discovered. A company official related that the driver had most recently worked for them from July 1, 1987 to July 22, 1987, but that he had worked for them at least two times previously doing seasonal hauling of agriculture products. The official related that on July 10th he was involved in an accident where he had passed another vehicle and pulled back into his lane too quickly, striking the vehicle. On July 19 he was involved in an accident where he fell asleep, went off the roadway, and lost his load. On July 22, he was involved in an accident where he fell asleep, went off the roadway and jackknifed the truck. All three of these July accidents were investigated by the California Highway Patrol and were noted on his California driving record. The driver was fired from this company on July 22, 1987. When the carrier's dispatcher was reinterviewed concerning which previous employers he made inquiry with, he stated he couldn't be sure, but did recall a couple of their own drivers giving him a good reference.

Tracy, California
Case No. 159

Prior to being hired, the driver furnished the carrier with a July 1, 1988 photo copy of his driving record from the California Department of Motor Vehicles. This record indicated a valid licenise with one speeding violation in August of 1985. Having been alerted by the California Highway Patrol that this driver was under suspension, the NTSB investigator examined the photo copy of the driving record and found it to be altered. When the NTSB investigator obtained a copy of his California driving record, it was determined that he had been under suspension since August 1, 1987. During the past 3 years, the driver had 2 moving violations, 1 hours of service violation, 1 equipment violation, 2 registration violations, and 4 for failure to appear. Including the accidents on August 22, 1988, he had been involved in 5 reportable accidents with commercial vehicles during the past 14 months. A 50-state check revealed that he was under suspension in California but was not licensed in another state. A National Drivers Register (NDR) check also revealed him to be under suspension in California.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 480 ng/ml of benzoylecgonine (metabolite of cocaine). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were screened at the request of the State of California for alcohol and barbiturates only. The blood sample was negative for alcohol and barbiturates.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's impairment due to fatigue and cocaine use.

CASE NO: 160

Investigation No.: ATL-88-H-TR30
Accident Location: I-95, 1.5 miles south of Darien, Georgia
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left, 4 feet; both asphalt
Median: 60 feet wide, grassed, swaled
Features Tangent on level gradient
Date and Time: July 25, 1988, 6:50 a.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: Loaded 1988 GMC straight truck
Motor Carrier: General Medical Corporation
Type of Operation: Private Carrier
Size of Operation: 70 trucks
Total Weight of Truck: 15,449 pounds
Total Length of Truck: 33 feet
Other Vehicle Involved: 1988 Mercedes Benz automobile
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The truck was traveling south in the right lane of a tangent, level highway when the speeding automobile struck it from the rear. On impact, the automobile rotated 90° counterclockwise on its vertical axis and underrode the truck up to the right rear wheels. With the automobile engaged at the rear, the truck veered left and crossed the inside traffic lane and left shoulder in a southeasterly direction. The truck rotated 90° counterclockwise on its vertical axis and disengaged from the automobile. Both vehicles moved laterally across the grassy median in a southeasterly direction. When the truck neared the center of the median, it rotated 180° clockwise on its longitudinal axis, onto its top, and continued skidding to the inside lane of the northbound pavement. At that point the unrestrained driver was ejected and the truck came to rest. At rest, the truck was on it's top, heading east, with the cab blocking the inside northbound traffic lane. The automobile skidded across the median in an upright position. It stopped heading east on the median and near the edge of the northbound pavement just south of the stopped truck. A fire ignited in the engine area of the automobile. It was extinguished by a local fire department about five minutes later. Measuring from initial impact to the rest location of each vehicle, the truck traveled about 384 feet and the automobile traveled about 454 feet. The lack of witnesses and physical evidence precluded a determination of speed on either vehicle. There was no evidence to indicate that either of the drivers applied brakes, or made any other evasive maneuvers, prior to the initial impact. The truck had a top speed capability of approximately 58 mph. The investigating patrolman estimated that the automobile was traveling a speed between 85 and 90 mph; he estimated that the truck was traveling between 55 and 60 mph.

Both of the drivers were traveling alone. The automobile was destroyed by crush damage and the postcrash fire. The restrained automobile driver sustained minor injuries. The truck cab and its freight van were destroyed.

Darien, Georgia
Case No. 160

It sustained moderate rear end frame damage and its cab was crushed downward to the top of the dashboard. The truckdriver was killed.

The private motor carrier operated a fleet of similar trucks that delivered medical supplies from 42 warehouse locations in the United States. It's trucking operation was subject to the Federal Motor Carrier Safety Regulations (FMCSR). This accident involved their single truck, and only truckdriver, domiciled at the Savannah, Georgia location. The 51-year-old truckdriver had no formal truckdriver training. He had no truckdriver experience prior to his employment with the current motor carrier. He had been employed by the carrier for about 7 1/2 years. He was a warehouse manager for the first 4 1/2 years and drove delivery trucks for the last 3 years. He held a valid Class 4 Georgia driver's license restricted to wearing corrective lenses. His previous five year driving record revealed one traffic violation conviction and no accidents. A 50-state check revealed no other drivers license. However, his driving privilege had been suspended in Florida since November 1985 for failure to appear in court on a traffic charge; consequently, he was driving while disqualified by the FMCSR. Part 391.15 of the FMCSR disqualifies an interstate driver when his drivers license, or operating privilege, is under suspension. The motor carrier had not qualified the truckdriver as required by the FMCSR Part 391. They had required him to take a physical examination three months earlier, but the examining doctor did not complete a truckdriver required Medical Examiner's Certificate. The findings of that examination indicated that he met the minimum physical requirements of FMCSR Part 391.41 (b). The truckdriver had been on duty for only 1 1/2 hours and was in compliance with the FMCSR Hours of Service Regulations.

The police investigation revealed that the driver of the passenger car was enroute from New York to Florida, and that he may have driven all night.

Blood samples from the truckdriver were not sent to the Center for Human Toxicology, and no toxicological tests for this driver were conducted by the State of Georgia.

Blood samples from the driver of the passenger car were tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the passenger car driver's excessive speed and failure to take avoidance action which may reflect impairment due to fatigue.

CASE NO.: 161

Investigation No.: ATL-88-H-TR31
Accident Location: County Road 207, 12.4 miles north of Lexington, Georgia
Lanes: 2 lanes, undivided
Shoulders: 6 feet, grass; both sides
Median: None
Features: Northbound right curve with a sag then crest vertical curve
Date and Time: July 26, 1988, 3 p.m.
Ambient Conditions: Cloudy and dry
Heavy Truck Involved: 1977 International tractor in combination with a flatbed trailer with 2 granite "sawblocks"
Motor Carrier: Henry Moon and Sons
Type of Operation: Common Carrier
Size of Operation: 7 power units
Total Weight of Truck: 71,000 pounds
Total Length of Truck: 53 feet
Other Vehicle Involved: 1977 Dodge passenger van
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 6

FACTUAL SUMMARY:

The combination unit traveled north on County Road 207. Simultaneously, the Dodge passenger van traveled south on the same highway. The combination unit entered a long five degree right curve with a slight vertical curve. Beyond the crest, the combination unit moved across the centerline of the roadway and the left side of the tractor struck the left front of the southbound van. Subsequently, the van impacted the left fuel tank, left dual tires of the forward tandem axle of the tractor, and the left tires of the forward tandem axle of the trailer. The van moved rearward and came to rest off the west side of the roadway about 70 feet from the area of impact. In the crash sequence, both granite sawblocks broke free of attached chains/binders and fell off the left side of the trailer; one struck the van. The combination unit came to rest about 159 feet north of the area of impact with the tractor off the west side of the roadway. Preimpact tiremarks left by the combination unit measured a total of 115 feet. The tiremarks extended about 55 inches across the centerline into the southbound roadway, and they ended abruptly about 38 inches across the centerline at the area of impact. The investigating police estimated the precrash speed of the combination unit at 50-55 mph.

The tractor sustained some damage to exterior framework near the lower left rear corner of the cab, or about 4.3 feet from the front of the vehicle. Slightly rearward, a scrape extended along the left fuel tank. The left side duel wheel assembly on the forward tandem axle was detached, and related components were broken. The trailer was slightly warped, and its entire tandem axle assembly was torn from the chassis. The untrained truckdriver was ejected and killed. The driver and two passengers of the van sustained minor injuries. The other three passengers in the van were seriously injured.

Lexington, Georgia
Case No. 161

The 29-year-old truckdriver had about three years experience in trucks; about one year was in heavy trucks. He had been employed by the motor carrier for about two weeks. There was no evidence that he had ever participated in any truckdriver training. A Georgia Class 5 driver license was originally issued to the truckdriver in 1974. The State record showed that on June 6, 1987, he was involved in an accident and cited for "No Insurance." He was convicted on July 13, 1987, and the Court suspended his driver license. The State subsequently documented a suspension for "Violation: Safety Responsibility (Security)," effective June 9, 1988. A suspension notice was sent, by certified mail, on May 9, 1988. The notice was returned "unclaimed" and retained in State files. The suspension of the driver's license remained in effect at the time of the accident, but no evidence was found to confirm that he was aware of the suspension. The truckdriver recorded no other traffic conviction or accident in the last three years.

The intrastate, for-hire motor carrier operated seven combination units in a three-county area primarily transporting granite from quarries to manufacturers. Although Georgia had adopted the Federal Motor Carrier Safety Regulations (FMCSR), in large part, a State statute specifically exempted "granite trucks, where transportation from quarry to finishing plant involves not crossing more than two counties." The motor carrier maintained no records for the truckdriver. The investigation revealed no evidence of excessive hours of service or fatigue. Reportedly, the truckdriver had loaded about 3 p.m. and departed a quarry. He drove about 3.5 miles to the accident location. The load was destined for a manufacturer in Elberton, Georgia; total distance of about 25 miles. The closing time for the manufacturer was 3:30 p.m. At the loading site (quarry), the truckdriver made remarks to a "loader" about whether he would be able to get to the manufacturer's location before the 3:30 p.m. closing time.

Blood samples from the truckdriver were not sent to the Center for Human Toxicology due to an inadequate sample following State conducted tests.

Blood samples from the truckdriver were tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of the accident was the truckdriver's misjudgement of the safe operating speed for his vehicle and load on the roadway curvature.

CASE NO.: 162

Investigation No.: DEN-88-H-TR23
Accident Location: U.S. Highway 71, 30 miles south of Limon, Colorado
Lanes: 2 lanes, undivided
Shoulders: 3 feet, asphalt; both sides
Median: None
Features: At grade
Date and Time: August 29, 1988, 3:25 p.m.
Ambient Conditions: Clear, dry, daylight
Heavy Truck Involved: 1973 Freightliner tractor in combination with a loaded 30.5-foot trailer
Motor Carrier: Frazier Showes of America, Inc.
Type of Operation: Private Carrier
Size of Operation: 18 power units
Total Weight of Truck: 27,500 pounds (approximate)
Total Length of Truck: 40 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Freightliner combination unit was traveling south on U.S. Highway 71. At a point 30 miles south of Limon, Colorado, the vehicle went off the west edge of the paved shoulder, leaving 135 feet of tire marks along the edge of the ditch, then 43 feet of locked wheel skidmarks at the edge of the paved shoulder to where it struck a delineator post. The vehicle then traveled for 324 feet in the west ditch, rotated 90° to the left, and rolled onto its right side and top. The vehicle traveled for another 50 feet, coming to rest with the tractor and trailer inverted, facing east, with the tractor blocking the southbound traffic lane and the trailer in the west ditch directly behind the tractor.

The accident resulted in fatal injuries to the unrestrained driver who was partially ejected through the windshield. The tractor received substantial crush damage to the roof. The trailer and its load sustained moderate damage.

The NTSB investigation revealed that the driver had a Class "C" Texas drivers license. This class license did not authorize the operation of a combination unit. A three year check of the driver's record revealed no traffic violations or accidents. The driver did not have a valid medical certificate. No record or information could be found to indicate the driver had any formal heavy truck driving training The driver was employed by the carrier two weeks prior to the accident and had operated the accident vehicle on one other occasion, traveling about 125 miles.

Further investigation revealed that the driver had worked for 12 hours on August 27, and 12 hours on August 28, as a laborer for a carnival. He had completed work at 2 a.m. on August 29. Log sheets found in the wreckage were dated August 21 through 28 and were not completed. A log sheet dated

Limon, Colorado
Case No. 162

August 29, 1988, showed the driver driving from midnight to 8 a.m. with no further entries. According to a carrier representative, the vehicle left Sidney, Nebraska, at 9 a.m. The driver and vehicle went through a port of entry checkpoint after entering Colorado. Neither the vehicle nor the driver were checked by the personnel at the checkpoint. The driver stopped in Limon, Colorado, where a clerk at a convenience store related that he had purchased a six pack of beer about one hour before the accident. Four full cans of beer were found in the wreckage of the tractor. The other two cans could not be located.

A postaccident inspection by NTSB revealed that the tractor brake pads and shoes were contaminated with oil. The air lines on the trailer were a mixture of different diameter pieces of hoses. Numerous maintenance deficiencies were noted on both the tractor and trailer.

The company was a private carrier who hauled their equipment and supplies from one carnival site to the next in a five-state area. The company did not maintain the maintenance records or drivers files as required by Federal Motor Carrier Safety Regulations. There was no record that the carrier had been audited by the U.S. Department of Transportation.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the NTSB testing protocol. CHT determined that the blood sample contained 0.17 percent alcohol. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Colorado. This test indicated that the blood sample contained 0.189 percent alcohol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's impairment due to alcohol and fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 163

Investigation No.: MKC-88-H-TR21
Accident Location: State Highway 100 near Whiteville, Tennessee
Lanes: 2 lanes, undivided
Shoulders: Right, 10.3 feet; left, 13.5 feet; both dirt
Median: None
Features: Straight, at grade
Date and Time: August 28, 1988, 5:45 a.m.
Ambient Conditions: Clear
Heavy Truck Involved: 1985 International tractor in combination with a loaded MC-306-AL tank trailer
Motor Carrier: E. L. Morgan Company
Type of Operation: Private Carrier
Size of Operation: 4 power units
Total Weight of Truck: 79,600 pounds
Total Length of Truck: 52 feet
Other Vehicle Involved: 1972 Ford Torino 2-door sedan
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 2 Other Injuries: 0

FACTUAL SUMMARY:

The 1985 International combination, loaded with 8500 gallons of gasoline, was eastbound on SH 100. A westbound 1972 Ford Torino traveled across the centerline and struck the 1985 International in the left front. The combination unit traveled 112 feet in an easterly direction where it crossed the center line, then traveled another 90 feet to where it departed the left edge of the travelway. The truck continued across the 13.5-foot shoulder where it impacted the back slope, traveled up the back slope, then back down into the roadside ditch where it came to rest on its wheels 447 feet east of the point of impact. A postimpact fire ensued. The other vehicle rotated approximately 160° counterclockwise and came to rest on the north edge of the roadway.

The combination unit was destroyed by the postimpact fire. The only remaining parts were the steel frame, drive train, and trailer axles. Consequently, it was not possible to make a determination as to system failure. The left frame rail was rotated clockwise 180° to where the right frame should have been. The engine and transmission were torn loose from the chassis. The truckdriver was ejected and fatally injured by the postimpact fire. The driver and passenger of the other vehicle were fatally injured. The unrestrained passenger of the car was ejected. Due to the intense fire and the destruction of the physical evidence, no speed estimate could be made.

The driver of the truck had been employed by this company for 3.5 months. He listed driving experience in vans, tanks, and flatbed trailers on his employment application. However, he did not give any length of time or miles driven. A check with a previous employer listed on his application revealed that he had driven a concrete mixer truck for 3.5 years. A 50-state check of his driving record revealed no additional licenses or records. A check of his Tennessee record indicated that he was involved in a minor property damage accident in 1976.

Whiteville, Tennessee
Case No. 163

There was no toxicology specimen obtained from the truckdriver due to the severity of the postimpact fire. The driver of the car tested positive for alcohol, with a result of .04 percent. There were no witnesses, consequently no determination could be made as to where and when during the accident sequence the fire started.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the Ford driver's impairment due to alcohol.

CASE NO.: 164

Investigation No.: NYC-88-H-TR20
Accident Location: Interstate 287 south, Bernards Township, New Jersey
Lanes: 4 lanes, divided.
Shoulders: Right, 12 feet; left, 2 feet; both asphalt
Median: 50 feet, earthen and partly wooded
Features: Level, at grade, straight
Date and Time: August 26, 1988, 2:56 p.m.
Ambient Conditions: Clear, daylight, and dry
Heavy Truck Involved: 1982 Mack dumptruck
Motor Carrier: Mt. Hope Trucking Co., Inc.
Type of Operation: Private Carrier
Size of Operation: 52 trucks
Total Weight of Truck: 76,000 pounds (GVWR - 70,000 pounds)
Total Length of Truck: 25 feet (approximate)
Other Vehicle Involved: 1982 Ford COE tractor in combination with a refrigerated van trailer

Truck Fatalities: 1
Other Fatalities: 0
Truck Injuries: 0
Other Injuries: 1

FACTUAL SUMMARY:

A 1982 Mack dumptruck carrying sand and stone was southbound on Interstate 287 on a scheduled trip from Wharton, New Jersey, to Staten Island, New York. A witness traveling to the rear of the Mack stated that the truck drifted off the roadway onto the right shoulder several times. As the truck approached milepost 25 at the Line Brook Road overpass, it again drifted off the roadway onto the right shoulder and struck the rear of a 1982 Ford combination that was stopped on the shoulder under the overpass.

The unrestrained 30-year-old Mack driver was killed in the crash--the Ford driver received minor injuries. The front of the Mack was crushed rearward 6.5 feet and .5 feet leftward. The dashboard area of the cab was collapsed rearward onto the driver's seat. A postcrash inspection of the Mack revealed no mechanical defects.

The Mack driver had approximately 1 1/2 years experience with similar truck operations; he had been employed by the motor carrier for less than one month. He possessed valid New Jersey and Massachusetts driver's licenses. A review of his New Jersey driver record revealed that he had been cited 8 times for speeding between 1977 and 1988. During the same period he was involved in 9 accidents, cited twice for careless driving, and arrested once for operating under the influence of alcohol or drugs. The New York Department of Transportation revealed that the driver was under suspension for traffic violations committed when involved in an accident in that state in May 1987.

The investigation revealed that the truckdriver had accumulated 73 hours of duty in the past eight days, and that he routinely worked 11 to 13 hours per day. He had slept only 5 hours the night before the accident, and had went on-duty at 5:30 a.m. His normal sleep pattern included an average of 8 hours sleep per night.

Bernard's Township, New Jersey
Case No. 164

Blood samples from the Mack driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1.4 ng/ml of the psychoactive component of marijuana (THC), 18 ng/ml of the non-psychoactive component of marijuana (COOH-THC), and 234 ng/ml of benzoylecgonine (metabolite of cocaine). No other drugs, as identified by the NTSB testing protocol, were identified.

Blood and bile samples from the Mack driver were also tested at the request of the State of New Jersey. This analysis indicated that the blood sample contained 160 ng/ml of benzoylecgonine In addition, the bile sample was found to contain 1030 ng/ml of benzoylecgonine and 5580 ng/ml of morphine.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Mack driver's impairment due to his use of drugs, marijuana and cocaine, and fatigue. The possibility of impairment due to morphine could not be determined.

CASE NO.: 165

Investigation No.: NYC-88-H-TR22
Accident Location: U.S. Highway 40, 4 miles west of Grantsville, Maryland
Lanes: 2 lanes, undivided
Shoulders: Right, 10.6 feet; left, 9.1 feet; both dirt and gravel
Median: None
Features: At grade, 3 percent upgrade, 371-foot left curve
Date and Time: June 11, 1988, about 9:15 p.m.
Ambient Conditions: Clear, 72°F and dry
Heavy Truck Involved: 1987 International 2-axle straight truck
Motor Carrier: Irongate Inc.
Type of Operation: Welding Contractor
Size of Operation: 2 straight trucks
Total Weight of Truck: 10,600 pounds (approximate)
Total Length of Truck: 23 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The International truck loaded with welding equipment was traveling eastbound on U.S. 40, about .2 mile east of Church Run Road. As the driver was negotiating a left curve, the truck went off of the right side of the roadway, swerved leftward back across both lanes, overturned 90°, struck a road sign and telephone pole, and then overturned an additional 360°. During the crash, the unrestrained driver was ejected and killed. There were no witnesses to this accident. The Safety Board was notified of the crash several months after it occurred.

The speed limit for the highway was 50 mph. An inspection of the vehicle failed to reveal any mechanical deficiencies that would have contributed to this accident. There were no tiremarks observed on the road at the accident site. The driver was reportedly familiar with the highway, but was not a professional truckdriver. He was operating this vehicle without the owners authorization. The driver was employed by the truck owner as a laborer and had no formal driver training or experience. The owner was engaged in welding contracting, and used its vehicles for the transportation of men and welding equipment to and from job sites.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quamnification according to the toxicological protocol. CHT determined that the blood sample contained 0.25 percent alcohol and 2,500 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of Maryland. This analysis also indicated that the blood sample contained 0.25 percent alcohol, but did not identify the caffeine found by the Center for Human Toxicology.

Grantsville, Maryland
Case No. 165

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to alcohol. Contributing to the severity of the driver's injuries was his failure to wear the available seatbelt.

CASE NO.: 166

Investigation No.: CHI-88-H-TR25
Accident Location: State Route 24, about 4 miles north of Madison, Georgia
Lanes: 3 lanes, undivided
Median: None
Features: Straight, upgrade to south
Date and Time: August 30, 1988, 3:30 a.m.
Ambient Conditions: Dark, unlighted, with light fog
Heavy Truck Involved: 1983 GMC Astro conventional tractor in combination with a refrigerator trailer loaded with ice cream
Motor Carrier: PET Dairies, Inc.
Type of Operation: Private Carrier
Size of Operation: 120 power units, 645 straight trucks
Total Weight of Truck: 58,939 pounds
Total Length of Truck: 56 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination vehicle was traveling south on Georgia 24. At 0.5 mile north of County Road 172, the GMC vehicle drifted off the right (west) side of the roadway while traveling on a straight, three lane wide section of highway. The vehicle travelled approximately 120 feet on the shoulder before striking a road sign, a small embankment supporting a private driveway, and a mailbox. It overrode the end of a section of "W-beam" guardrail, descended a roadside embankment, and overturned. The police report revealed that the truck's left side tires left 45 feet of skidmarks on the pavement before striking the private driveway embankment. The police also indicated that fog was present at the time of the accident.

The combination vehicle came to rest on its roof at the bottom of the roadside embankment, after having rolled over approximately 180°. The driver was ejected and fatally injured. No autopsy was conducted on this driver. The Morgan County Coroner stated since there was no foul play involved in the death, and no family request for an autopsy, and the coroner and police department agreed there was no need for an autopsy, none was required.

No mechanical deficiencies were found during the postcollision inspection of this combination vehicle.

This driver had a total of approximately 12 years of experience operating combination vehicles of the configuration involved in this accident. He had been employed by this private motor carrier since March 20, 1981. The driver had received no formal training in heavy truck driving. He had a physical examination on August 5, 1988, for recertification. On the medical examination form, under "Health History" the yes block for diabetes was checked. A notation on the medical examination form explaining this indication of diabetes states "Treatment - diet only." The blood pressure of

this driver was recorded as 156/98 during this examination. The wife of the driver stated that she thought the driver had taken "Lasix" pills for three weeks, but did not remember when he had taken them.

The wife of the driver stated that he had driven a company trip to Charlotte, North Carolina, on August 29, getting up at 6:30 a.m. that morning and returning home at about 3 p.m. The driver slept for 3 hours after returning home, then watched his son until leaving at 9 p.m. to go to work in Hickory, North Carolina.

The carrier stated that the driver was off work on August 29, until 10 p.m. According to the carrier, this driver left their Hickory plant about 11 p.m. in the accident-involved combination vehicle, bound for Macon, Georgia. The distance from the Hickory, North Carolina, plant to the accident scene was approximately 230 miles. The company stated that the driver was ahead of schedule when the accident occurred, having to travel only 60 more miles in four hours to reach his destination.

The driver had a valid class A operator's license from North Carolina which was to expire December 6, 1991. Contact with the North Carolina Highway Patrol verified that this license permitted the driver to operate heavy combination vehicles.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BASES.

Blood samples from the truckdriver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 167

Investigation No.: SEA-88-H-TR19
Accident Location: State Route 99, 1.0 mile south of Merced, California
Lanes: 4 lanes, divided
Shoulders: Right, 7.1 feet; left, 2.5 feet; both asphalt
Median: 15 feet, gravel
Features: At grade, straight, flat
Date and Time: May 27, 1988, 6:10 a.m.
Ambient Conditions: Cloudy, daylight, and dry
Heavy Truck Involved: Loaded 1985 GMC straight truck
Motor Carrier: Central California Popcorn
Type of Operation: Private Carrier
Size of Operation: 2 power units
Total Weight of Truck: 7,561 pounds (14,000 pounds GVWR)
Total Length of Truck: 23 feet
Other Vehicle Involved: 1979 White Freightliner COE flatbed truck in combination with an empty 30-foot trailer

Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1985 GMC van had just been fueled about 2.5 miles north of the accident site and was southbound on State Route 99. An empty 1979 White Freightliner flatbed truck and trailer, also southbound, had moved into the median lane, preparing for a left turn onto McHenry Road. Witnesses reported that the driver of the flatbed truck had turned on his left turn signal, and that most traffic had moved to the right to pass him. One witness stated that the GMC van passed him at an estimated speed of 65 mph. Since there was no left turn lane, the trailer from the combination unit was still partially in the median lane as the truck pulled into the turn area. The GMC van struck the trailer on the right side of the rear end. This impact separated the trailer from its front axle, turntable, and drawbar which remained attached to the truck. The truck was pushed ahead slightly, while the trailer rotated 180 degrees counterclockwise and came to rest ahead of and to the right of the flatbed truck. The GMC van came to rest about 105 feet in front of the flatbed truck across both northbound lanes after rotating about 75 degrees in a counterclockwise direction.

The restrained driver of the GMC van was pronounced dead at the scene. He was found in the detached driver's seat, which was lying on its right side in the passenger compartment. The unrestrained driver of the flatbed truck was not injured.

The majority of the damage to the GMC van was confined to left front area, with a maximum crush rearward of about 36 inches on the left corner of the front bumper. The deck of the flatbed trailer produced contact damage through the driver's door into the "B-pillar". No damage was reported to the flatbed truck, but the trailer received substantial damage to the rear end and front axle.

Merced, California
Case No. 167

GMC had issued a factory recall for the this 1985 GMC van stating "The left-hand lower control arm can crack starting at the rear flange and progress to the ball joint mounting hole and eventually cause the lower ball joint to separate from the control arm." An NTSB examination found no cracks in the mentioned control arm.

In the accident area, State Route 99 was a divided highway with a 55 mph speed limit. Most access areas were the typical ramp interchanges. There are several turn areas provided across the median, some with left turn lanes and some without. At the accident site, McHenry Road intersected S.R. 99 from the east and there was no left turn lane for the southbound traffic on S.R. 99.

The driver of the GMC van possessed one valid class 3 driver's license, which had been suspended from 06-10-87 through 12-09-87. In the two years before the accident he had received three speeding violations and had been involved in one other accident which was judged to have been his fault. The GMC driver had eight years experience driving heavy trucks, six months experience in the accident vehicle, but no formal training in the operation of heavy vehicles. The driver of the flatbed truck and trailer had no violations and had not been involved in any accidents over the last three years.

The investigation revealed that the GMC driver routinely worked long days, normally starting his day at 5:30 to 6 a.m. On the day of the accident, his day began at 4:30 a.m., after 7 hours of sleep. It was noted, however, that the driver and his fiancee had consumed a pitcher of margaritas before retiring for the night.

Blood samples from the GMC driver were tested at the request of the State of California with negative results.

Urine samples from the GMC driver were sent to the Center for Human Toxicology for testing according to the toxicological protocol. CHT determined that the urine sample contained unquantified amounts of acetaminophen (analgesic), salicylate (aspirin), and caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the failure of the driver of the GMC van to perceive and take appropriate action to avoid the combination unit. Fatigue probably contributed to that failure.

CASE NO.: 168

Investigation No.: LAX-88-H-TR21
Accident Location: U.S. Highway 101 at Western Avenue off-ramp, Los Angeles, California
Lanes: Single, 12 feet wide asphalt transition ramp
Shoulder: Right, 4 feet
Median: None
Features: 6 percent upgrade, right curve
Date and Time: June 27, 1988 12:35 p.m.
Ambient Conditions: Daylight, dry, 75°F Clear Weather Conditions
Heavy Truck Involved: 1973 Ford Model 9000 3-axle straight truck
Motor Carrier: Basic Fibers, Inc.
Type of Operation: Private Carrier
Size of Operation: 6 straight trucks
Total Weight of Truck: 28,000 pounds
Total Length of Truck: 27 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The Ford truck was traveling southbound U.S. 101 approaching Gower Avenue in the #3 of 4 traffic lanes at approximately 55 mph. The truck was thought by witnesses to be discharging what appeared to be vehicle parts from the undercarriage of the motor truck. The vehicle was further observed to slow momentarily to about 15 mph and move into the #4 traffic lane and again to increase its speed. Approximately two miles south of Gower Avenue the vehicle exited the Western Avenue off-ramp. The vehicle ran off the left roadway edge, struck a sign post, climbed a dirt embankment, and collided with a 6 feet by 8 feet concrete wall. It came to rest at the concrete retainer wall.

The accident resulted in fatal injuries to the unrestrained driver of the truck. The driver remained within the occupant area of the cab and was removed by rescue personnel. He was pronounced dead at the hospital as a result of the injuries sustained in the collision.

An examination of the truck cab revealed major steering wheel rim and steering wheel shaft deformation. The cab did not have a seatbelt for the driver position. The exterior cab body sustained major crush damage to the lower front end. The entire front axle was stripped from the front suspension system and major damage was sustained to the engine and drive train.

The carrier and the driver's wife estimated that the driver had at least 10 years of experience as a heavy vehicle operator. The driver held a Class 2 operator's license issued by the State of California, which was proper for the type vehicle being driven; however, a valid medical certificate could not be found among the personal effects of the driver, nor in the driver qualification file of the carrier. A search of the California Department of Motor Vehicle files revealed that his current class 2 operators license was issued on 12-10-87 and expired on his birthday in 1990. The license was not restricted in any way. The record reflected one accident and three traffic

Los Angeles, California
Case No. 168

violations (all of a minor nature), between 3-11-86 and 12-30-86. A 50 state check was also completed on the driver and returned negative on suspensions or revocations. A National Driver Register check was conducted and also returned negative.

A postcrash mechanical examination of the Ford 3-axle motor truck performed by the Southern Division Motor Carrier unit of the California Highway Patrol, found the brakes on axle #2 and axle #3 to exceed the recommended maximum stroke at which the brakes should be readjusted. Further, it was revealed that the left brake diaphragm on axle #3 was defective and failed to hold applied air pressure. Additionally, an excessive amount of oil accumulation was found in the air brake hoses and brake chambers. The California Highway Patrol concluded that their examination "revealed inadequate preventive maintenance resulting in contamination of the air brake parts, and all brakes being out of adjustment." The report further concluded that "the out of adjustment brakes could have been a major contributing factor to the cause of this accident."

The carrier had been operating as a private motor carrier since 1979. The carrier operated in the Los Angeles Basin only. An examination of the carrier revealed that the carrier did not maintain driver qualification files, vehicle maintenance records, driver logs, or lease agreements on leased operators. The carrier employs 2 regular employee drivers and 4 leased operators. The carrier's operation required the purchasing of recyclable card board, aluminum and glass. The products were transported from retail stores to the carrier's warehouse facility where the recyclable materials were bailed and prepared for distribution to processing plants. Vehicle maintenance was conducted only on the two carrier owned motor trucks. All other vehicle maintenance on carrier operated units was conducted by the lease operator. The carrier related that vehicle maintenance was conducted on their vehicle monthly, or at 5-7000 mile intervals, plus daily inspections, however, there were no records to support that contention. Further, the carrier related that they were last inspected by the California Highway Patrol in June of 1986 and received a satisfactory rating, but had not been inspected by any agency since--no such inspection could be verified by the CHP. The carrier records reflected that a copy of liability insurance coverage was not in the possession of the carrier for the accident vehicle. Investigation of the circumstances found that the vehicle was without insurance coverage, and that the carrier did not require proof of insurance prior to leasing the equipment as a condition of employment.

Further, it was determined that the vehicle was purchased in an "AS IS" condition by the driver two months prior to the collision date. Records showed that the brakes were adjusted last by its previous owner, one year prior to the collision on 6-17-87. There were no maintenance records available from the current owner.

Urine samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for testing according to the toxicological protocol. CHT determined that the urine sample contained an

Los Angeles, California
Case No. 168

unquantified amount of both caffeine and salicylates (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified.

Spleen samples from the truckdriver were tested at the request of the State of California with negative results.

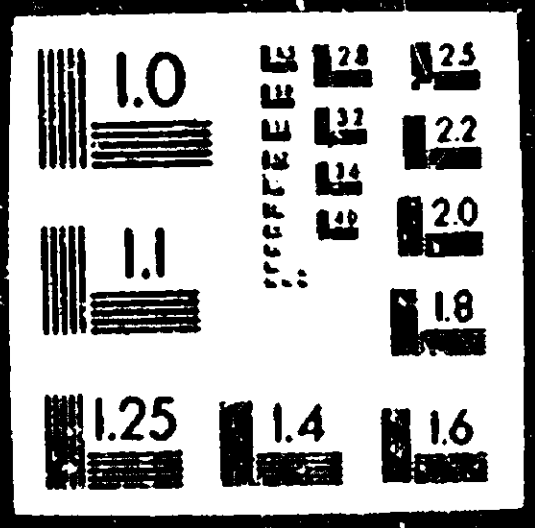
PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's failure, for unknown reasons, to maintain his vehicle upon the available travel lanes.

5 OF 5

PB 90

917 003



CASE NO.: 169

Investigation No.: SEA-88-H-TR20
Accident Location: Road 12, 1 mile south of Kingsburg, California
Lanes: 2 lanes, undivided
Shoulders: Right, 8.2 feet; left, 10 feet; both asphalt
Median: None
Features: Straight, 4 percent upgrade, intersection with off-ramp
Date and Time: July 13, 1988, 1:50 p.m.
Ambient Conditions: Clear, daylight, and dry
Heavy Truck Involved: 1961 Autocar conventional tractor in combination with a loaded 35-foot Fruehauf flatbed trailer
Motor Carrier: Harley Freeman Farms
Type of Operation: Private Carrier
Size of Operation: 3 power units
Total Weight of Truck: 55,350 pounds
Total Length of Truck: 50 feet
Other Vehicle Involved: 1982 Peterbilt conventional tractor in combination with two loaded 24-foot flatbed trailers

Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The driver of the 1961 Autocar combination loaded with bins of peaches had just left a grading station about three miles south of the accident site. He was traveling north on Road 12 at a witness estimated speed of 40 mph. A 1982 Peterbilt pulling doubles loaded with bags of fertilizer had exited State Route 99 and had pulled up to the stop sign at Road 12. As the Autocar approached the intersection, the doubles combination began its left turn north onto Road 12. Witnesses in a house about 500 feet south of the accident site stated that they heard a horn blowing halfway between their house and the intersection. The front of the Autocar tractor struck the right rear of the first trailer behind the Peterbilt. A witness reported the speed of the Peterbilt at impact to be 10 mph. After the collision, the Peterbilt pulled away from the Autocar and parked on the shoulder. The Autocar tractor and trailer came to rest up against a curb on the outside of the shoulder with the left side of its front axle at the end of 20 feet of gouges in the asphalt roadway. No restraint was found in the Autocar tractor. The driver was found trapped behind the steering wheel and was pronounced dead about 40 minutes after the accident. The driver of the Peterbilt was not injured in the collision.

The Autocar tractor sustained damage to the front and rear. The firewall was deformed rearward about 12 inches. The top rear portion of the cab was pushed forward about 38 inches. The distance from the steering wheel hub to the back of the driver's seat was measured at 11 inches. The left front wheel had been broken off. The left side saddle tank was ruptured, but no fire resulted. The only damage to the doubles combination was some minor bending to the right rear of the first trailer.

Kingsburg, California
Case No. 169

Similar tractor-trailer combinations were timed from when they passed the stop line until the rear of their first trailer crossed the beginning of the gouges on Road 12. Out of four combinations, two came to a complete stop, while two others rolled through the intersection. Their times ranged from seven to 10 seconds.

An NTSB examination of the 2-axle Autocar tractor revealed that there were no brakes installed on the steering axle. The two brakes on the drive axle were found to be outside the legal limit of adjustment. Therefore, the combination of tractor and trailer had two of its six brakes out of adjustment.

The load of peaches on the flatbed behind the Autocar had been secured with two ropes attached to hooks on the rear of the trailer and winches on the front. Neither the tractor nor the trailer was equipped with a tractor protection rack or headerboard. After the collision, these two ropes were found broken, and the load was found shifted forward overrunning the passenger compartment of the Autocar.

The driver of the Autocar possessed a valid class I California driver's license. His driver record for the 3 years before the accident showed no violations or accidents. He had two years experience driving heavy trucks and three seasons, totaling about nine months, experience in the accident vehicle, but no formal training. The driver of the Peterbilt also held a valid class I California driver's license. His driving record showed two brake adjustment violations and one speeding violation in the last three years. He also was involved in one other accident in the same time period.

Blood samples from the Autocar driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 1,600 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the Autocar driver were also tested at the request of the State of California. This testing did not include caffeine. No drugs were found in the California laboratory testing.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Peterbilt driver's failure, for unknown reasons, to yield right-of-way at the stop sign. Contributing to the accident was the Autocar driver's failure, for unknown reasons, to take timely and appropriate evasive action. Contributing to the severity of the accident was the lack of a tractor protection rack on either the Autocar tractor or the Fruehauf trailer, allowing the load to shift forward into the passenger compartment.

CASE NO.: 170

Investigation No.: CHI-88-H-TR26
Accident Location: Interstate 77 at Fourth Creek Bridge, Statesville, North Carolina
Lanes: 4 lanes, divided
Median: Grass
Features: Straight roadway, 5.5 percent downgrade
Date and Time: September 4, 1988, 2:06 a.m.
Ambient Conditions: Dark, heavy rain, strong winds.
Heavy Truck Involved: 1979 Freightliner conventional tractor in combination with two 28-foot van trailers
Motor Carrier: Consolidated Freightways, Inc.
Type of Operation: Common Carrier
Size of Operation: 2,939 power units
Total Weight of Truck: 66,500 pounds (approximate)
Total Length of Truck: 64 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The combination vehicle loaded with 37,329 pounds of general merchandise was traveling south on Interstate 77 near Statesville, North Carolina. A storm was passing through the Statesville area at the time, with rain and high winds reported. The combination vehicle descended a 5.5 percent slope in the roadway located south of where I-77 crosses above I-40, to a level section of roadway, passing an entrance ramp onto I-77 from I-40. At the Fourth Creek Bridge, the vehicle went off the left side of the roadway where it struck and penetrated a "W-beam" guardrail. The vehicle entered and crossed the grass covered median, struck a guardrail for the northbound lanes, struck and overrode a concrete retaining wall, and descended an embankment between the north and southbound lanes of I-77. The vehicle came to rest in Fourth Creek, with the tractor approximately 35 feet below the roadway level.

As the tractor came to rest in the stream, the tractor cab was detached from the chassis. The trailers were destroyed and came to rest on the slope area and in the stream. The cargo of the trailers was scattered over the median by the retaining wall, under the bridge decks, and in the stream.

The driver of the Freightliner vehicle was ejected and fatally injured. He was found by rescue personnel approximately 2 hours following the accident, lying in the Fourth Creek underneath spilled cargo of the trailers approximately 30 feet east of the tractor (downstream).

This driver had been employed by this carrier since 1981. He had 5 years of experience operating this type of combination unit, and approximately 27 years of heavy truck driving experience. The driver had no formal truckdriving training. He had apprenticed with an experienced driver and worked for two years at the terminal of this motor carrier. This motor carrier conducted monthly safety seminars and had a disciplinary policy for safety violations.

Statesville, North Carolina
Case No. 170

The driver had a valid North Carolina Class A license. There was no record of violations, convictions, or suspensions of that license. He was involved in one accident in the three years proceeding this accident, when the truck he was driving was struck in the rear by another vehicle.

According to the driver's wife, he was off work on September 1, 1988, until 1500 hours. According to his log book for that date, he drove a total of 375 miles in 7.5 hours, on September 1, from Charlotte, North Carolina, to Ellenwood, Georgia. On September 2 the driver drove a total of 325 miles in 6.5 hours, and was off duty from 0230 hours to 2000 hours. The driver's wife stated that he slept and worked around the house during the day on September 2, and left for work at about 1930 hours. On September 3, the driver was on-duty from 0000 to 0100 hours, off duty from 0100 to 0145 hours, and driving from 0145 to 0545 nours. The log book of the driver showed him off duty from 0545 to 1800 hours on September 3, 1988. That was the last entry of this driver in his log book.

According to his wife and the motor carrier, the driver had left his home at approximately 1730 hours on September 4, 1988, and driven to the Charlotte, North Carolina, terminal of the carrier. He left there at approximately 1800 hours and drove 204 miles to Roanoke, Virginia, in the accident involved vehicle. Once in Roanoke, he was at the terminal for approximately one hour, then drove approximately 170 miles from Roanoke to the accident scene in approximately 4 hours.

A witness interviewed by the police department reported that he was following the accident vehicle south on I-77. He stated:

> "As I topped the hill I observed a truck in the right lane and a car beside it... The car moved to the right in front of the truck. The truck driver applied his brakes and moved over to the left lane and kept on going. It was almost like he drove into the creek. He had no control over it. I did see the brake lights come on on (sic) the truck when the car moved over in front of the truck. I cannot tell what kind of car it was or any description due to the rain. I was traveling between 50 and 55 mph and was gaining on the truck..."

As the tractor came to rest in the stream, the tractor cab was detached from the chassis. The trailers were destroyed and came to rest on the slope area and in the stream. The cargo of the trailers was scattered over the median at the location of the retaining wall, under the bridge decks, and in the stream.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 2,400 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

Statesville, North Carolina
Case No. 170

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the impairment of the truckdriver due to fatigue. The severity of this accident was increased by the failure of the guardrail installed on the median of I-77, at the north end of the Fourth Creek bridge, in the southbound lanes, to redirect the Freightliner combination vehicle to the roadway. The severity of this accident was also increased by the failure of the Freightliner tractor cab to provide protection to the occupant of that cab.

CASE NO.: 171

Investigation No.: LAX-88-H-TR22
Accident Location: Interstate 10, 3 miles north of Palm Desert, California
Lanes: 6 lanes, divided
Shoulders: Right, 9 feet, asphalt, bordered by a 50-foot dirt road edge leading to a row of trees; Left, 7 feet, asphalt
Median: 35 feet, dirt
Features: Straight, at grade
Date and Time: September 6, 1988, 11:27 p.m.
Ambient Conditions: Dark, clear, dry
Heavy Truck Involved: 1987 International COE tractor in combination with one partially loaded 28-foot trailer and one empty 28-foot trailer
Motor Carrier: Clearwater Trucking, Inc.
Type of Operation: Common Carrier
Size of Operation: 56 power units
Total Weight of Truck: 39,566 pounds
Total Length of Truck: 65 feet
Other Vehicle Involved: One boom truck in tow by another boom truck, and another unidentified truck

Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 2

FACTUAL SUMMARY:

The combination unit was eastbound in the third lane of Interstate 10, on an unlighted portion of the roadway that transects the desert. Earlier in the evening, a truck had parked partially on the shoulder and partially in the dirt at the right side of the shoulder. A second truck, a utility boom truck which had been junked by the telephone company and which was towing an identical truck, was also eastbound in the third lane at a witness reported speed of about 45 mph. The combination unit failed to slow or change lanes to avoid the slower moving traffic and impacted the rear of the towed truck. The impact caused the combination unit to veer to the right, travel for an additional 300 feet at a 25° angle to the right, and strike a group of trees.

At impact with the trees, the combination unit reportedly burst into flames. The towing truck and the truck being towed separated shortly after impact, and the towing truck impacted the parked unit adjacent to the right road edge. The towing truck exhibited centrifugal skids and overturned onto its left side, coming to rest facing west in the #2 eastbound lane. The towed truck continued for an additional 750 feet and came to rest facing east in the center median.

The tractor and first trailer of the combination unit sustained total burn damage from the fire. There were no apparent serious traumatic injuries to the driver--he succumbed to inhalation injuries. The towing unit sustained moderate damage and its lapbelt restrained driver received minor injuries. A passenger in the towing unit, also reportedly lapbelted, complained of minor injuries. Neither wanted medical treatment.

Palm Desert, California
Case No. 171

There were no preexisting medical conditions, apparent debilitations, or deficiencies in the combination unit driver.

The driver had been a truckdriver for more than 20 years and had received formal training. He had an excellent record with this and previous employers. His California motor vehicle record indicated two out-of-state speeding violations and no accidents in the past three years.

A postcrash examination of the combination unit was not possible due to the burn damage received. There was no evidence, however, that any precrash evasive maneuvers were attempted. The telephone boom truck, which was towing an identical truck, had been sold as salvage by the telephone company and was enroute to Mexico at the time of the accident. A postcrash examination of the filaments by the California Highway Patrol indicated that the rear lights of the truck being towed were on at the time of the collision. The lights of the truck parked at the right road edge were not on and no reflectors had been set. The driver and passenger of the boom truck, the boom truck, and the driver of the roadside truck all departed immediately postcrash and returned to Mexico.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the poor conspicuity of the slow moving boom truck combination.

CASE NO.: 172

Investigation No.: MKC-88-H-TR22
Accident Location: U.S. 17, 9.5 miles north of Shallotte, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Both sides are grass and sand
Median: None
Features: Flat, occasional curves
Date and Time: September 9, 1988, 2:30 p.m.
Ambient Conditions: Daylight and raining
Heavy Truck Involved: 1983 Peterbilt COE tractor in combination with a tanker trailer loaded with 8,700 gallons of gasoline
Motor Carrier: Associated Petroleum Carriers, Inc.
Type of Operation: Common Carrier
Size of Operation: 433 power units
Total Weight of Truck: 78,010 pounds
Total Length of Truck: 62 feet
Other Vehicle Involved: 1987 Ford Dumptruck
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

A Peterbilt tractor pulling a tanker trailer was southbound, while a Ford dump truck was northbound on a two-lane, two-direction roadway. As the Peterbilt approached the Ford, the driver of the Ford lost control of his vehicle on the wet roadway. The Ford rotated counterclockwise and traveled into the path of the Peterbilt. The Peterbilt struck the Ford on the right side, 11 feet from the rear, causing the dump bed to come loose from the truck and fall to the ground. The Peterbilt cab jackknifed to the right as fire broke out. Both vehicles came to rest partially in the southbound lane and partially on the west shoulder.

Both vehicles were destroyed by fire. The restrained driver of the Ford escaped with only minor injuries--the Peterbilt driver was fatally injured. It could not be determined if the Peterbilt driver was wearing restraints.

The Peterbilt driver had been driving trucks for the past 26 years and for the last seven years has been with the same carrier. The carrier kept no training records in the driver's file, but did state that the driver had been to several classes on hazardous material, bad weather driving, and defensive driving. The driver was driving this particular truck because the regular driver was on jury duty. A driver's license check, made with South Carolina, indicated that since 1986 the driver had received six speeding violations. The company had a record of one of these violations. The company took three points away from the driver in 1983 because of an accident, but had no record of any points being taken away on the six speeding violations.

Tissue samples from the Peterbilt driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation,

and quantification according to the toxicological protocol. No drugs, as identified by the NTSB tetsing protocol, were identified. However, it was noted that the tissue sample was not of sufficient quantity to test for all but volatiles and RIA.

Blood samples from the Peterbilt driver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Ford driver's inappropriate control input (brake application and downshift) on the wet roadway.

CASE NO.: 173

Investigation No.: FTW-88-H-TR15
Accident Location: Rural Paved Road #1005, 12 miles southeast of Monroe, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Both sides; varying width grass shoulder
Median: None
Features: 478-foot radius right curve
Date and Time: September 14, 1988, 2:10 a.m.
Ambient Conditions: Clear, dark, and dry
Heavy Truck Involved: 1974 International COE tractor in combination with a 45-foot trailer loaded with chickens
Motor carrier: Peachland Poultry, Inc.
Type of Operation: Contract Carrier
Size of Operation: 7 power units
Total Weight of Truck: 65,000 pounds
Total Length of Truck: 60 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

At approximately 1:30 a.m. on September 14, 1988, the truckdriver departed the Jerry Blackmon Poultry farm near Pageland, South Carolina, on an approximate 40 mile trip to the Cuddy Poultry Processing plant in Marshville, North Carolina. After having driven approximately 25 miles in 40 minutes, the combination unit was northeastbound on Rural Paved Road #1005 at an estimated speed of approximately 55 mph. As the driver neared a 478-foot radius right curve, he began sounding his horn and waving to fellow workers at a poultry farm on the left side of the road. The entrance to this farm was approximately 500 feet south of the where the road began curving to the right. The International combination unit entered the curve on the wrong side of the road and its left side tires departed the travel surface and tracked on the soft earthen roadside. As the unit veered back to the road the trailer overturned on its left side. The tractor began sideslipping to the left and flipped over, coming to rest on its top. The combination unit travelled approximately 110 feet with its left tires tracking in the soft roadside material and slid on its side and top for approximately 100 feet. The accident curve was not preceded by a warning sign with an advisory speed plate. Safety Board investigators estimated that the curve should have been preceded by a 35-40 mph warning sign.

The flatbed trailer frame received minor damage, but the cages were displaced and approximately 800 of the 1,100 turkeys were destroyed. The International tractor roof was crushed down into the driver's seating area and the unrestrained driver was killed. The postcrash roof height of the 110-inch tall tractor was measured to be 79 inches.

The 43-year-old truckdriver had approximately 19 years of heavy truck driving experience, but had only been working for this motor carrier for 3

hours. The motor carrier had failed to qualify this driver under the Federal Motor Carrier Safety Regulations (FMCSR) as adopted by the State of North Carolina. Had the motor carrier conducted the required background check, he would have learned that the truckdriver was disqualified under the FMCSR. Safety Board investigators learned that the truckdriver had a permanently revoked driver's license in North Carolina, and his currently valid Georgia and Alabama license had been previously suspended. The driver had 3 moving violation convictions in North Carolina and 4 driving while revoked convictions in North Carolina. In Alabama, the driver had 3 moving violation convictions and 1 license suspension. In Georgia, the driver had 1 conviction for driving with a suspended license and his Georgia license had been suspended once.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's lack of attention to his driving task. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 174

Investigation No.: MKC-88-H-TR23
Accident Location: I-20, .5 mile south of Greensboro, Georgia
Lanes: 4 lanes, divided
Shoulders: Right, 10 feet; left, 3 feet; both asphalt
Median: 56 feet, grass
Features: At grade
Date and Time: September 14, 1988, 9:50 p.m.
Ambient Conditions: Clear, dry, and daylight
Heavy Truck Involved: 1988 Ford conventional, loaded dumptruck
Motor Carrier: Green County Board of Commissioners
Type of Operation: Private Carrier
Size of Operation: 9 power units
Total Weight of Truck: Unknown
Total Length of Truck: 14 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The dumptruck was westbound on I-20 in the right lane. As an uninvolved tractor passed it, the tractor driver noticed that there was no driver visible in the dumptruck. He then observed it crossing into the inside lanes and going into the median. The dumptruck continued 185 feet through the median and 135 feet across the two eastbound lanes of traffic. It then went 35 feet across an entrance ramp and 45 feet down a 22 percent slope into ditch on the south side of the roadway. The dumptruck travelled 249 feet up a 32 percent embankment before it turned back to the northwest, then travelled back down the embankment 165 feet before it crossed the ditch back onto the eastbound outside shoulder where it rolled onto its left side.

This accident crash in minor damage to the dumptruck, but the unrestrained driver was found dead in the vehicle. An autopsy performed by the Division of Forensic Sciences, Georgia Bureau of Investigation, determined that the cause of death was from atherosclerotic cardiovascular disease. The county supervisor indicated that the driver had complained about not feeling well the last couple of days, but did not take off from work.

When the Green County Board of Commissioners received some new trucks, they needed several new drivers. The county supervisor knew that this driver was looking for a job, and that he had previously driven a tractor-trailer before being laid off, but did not know how much experience the driver had and did not check into his background. This driver had been driving the accident truck for seven months, but had not filled out an application for employment with the county in that period. A check with the Georgia Department of Public Safety revealed that the driver had one improper passing and two driving under the influence violations. Also, his driving license was suspended on February 11, 1985, and reinstated on December 31, 1985.

Greensboro, Georgia
Case No. 174

The Green County Board of Commissioners did not require a medical certificate, road test, written test or an application for employment. The commissioners did not check into the driver's past employment or into the driver's past driving record.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the sample was not of sufficient quantity to test for BASES, stimulants, and anticonvulsants.

Blood samples from the dumptruck driver were also tested at the request of the State of Georgia with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's physical incapacitation due to cardiac failure.

CASE NO.: 175

Investigation No.: LAX-88-H-TR23
Accident Location: State Route 76 near Valley Center Road, Valley Center, California
Lanes: 2 lanes, undivided
Shoulders: Right, 4 feet, asphalt dropping off to dirt slope; left, 4 feet, asphalt
Median: None
Features: 9.4 percent downgrade, left curve
Date and Time: September 14, 1988, 10:50 a.m.
Ambient Conditions: Daylight, clear, dry
Heavy Truck Involved 1981 International 2-axle COE flatbed truck
Motor Carrier: M-K Ranch, Inc.
Type of Operation: Private Carrier
Size of Operation: 3 power units
Total Weight of Truck: 30,360 pounds
Total Length of Truck: 20 feet
Other Vehicle Involved: None
Truck Fatalities: 2 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The International flatbed truck, loaded with 20 crates of lemons, was westbound on State Route 76 approaching the intersection with Valley Center Road. The area of the accident was mountainous, with an 8.4 percent downgrade for westbound traffic. As the driver approached a 400-foot curve to the left, the vehicle left approximately 163 feet of centrifugal skidmarks emanating from the center of the eastbound lane and ending at approximately the centerline of the roadway. Gouge marks indicate that the vehicle began overturning in a clockwise direction about its longitudinal axis, scraping along the roadway for approximately 91 feet. The vehicle rolled approximately 180° onto its roof and struck a roadside barrier of 3 to 4-foot wide boulders. The vehicle surmounted the barrier before coming to rest atop the boulders. A postcrash inspection conducted by Motor Carrier officers of the California Highway Patrol failed to reveal any vehicle defects.

The vehicle sustained major deformation of the cab, with the overall height of the cab reduced to 53 inches at the right A-pillar. The cab was crushed rearward at the right seat approximately 42 inches. The roof was crushed down and to the rear to within 6 inches of the height of the flatbed. Both the unrestrained driver and unrestrained passenger sustained fatal head injuries. The passenger had been partially ejected from the vehicle; the driver was trapped in the vehicle by the downward roof crush. The load of nearly 17,000 pounds of lemons was spilled onto the roadway. The rear portion of the truck sustained moderate damage.

The driver had no formal driver training. He had advanced from a farm hand to farm equipment driver during the time he had been with the company. The majority of his experience had been driving around the private grounds of the ranch. For the past 3 years he had been operating the truck on short-haul

deliveries. This trip was to have been for the purpose of assisting another grower with transportation of his product. The carrier related that the driver had been assigned a route which would have bypassed mountainous terrain because he was returning loaded and was unfamiliar with the driving techniques required to safely complete the trip. At the time of the accident the driver was not on the prescribed route and was carrying an unauthorized passenger who had requested a ride to an unknown location.

The driver had been issued his California Class 3 license approximately 6 years previously, and had been convicted of reckless driving in 1986. Although the printed driver record does not reflect it, the driver was on probation for the reckless driving offense at the time of the accident. His probation was to end 7/89. He was limited to operating a vehicle belonging to his employer and in the course of his employment only. Although the driver had approximately 10 years driving experience, most of his experience was acquired driving on the private dirt roads of the ranch.

The roadway at the accident site was posted with a speed limit of 55 mph. Approximately one mile prior to the accident curve, signs were posted recommending a speed of 25 mph for the curved road. Approximately one half mile preceding the accident curve, there was another curve with a 500-foot radius. There were no signs indicating how long the represented curving road continues. There were no witnesses, but evidence indicates that for some unknown reason, the driver was attempting to negotiate the accident curve from the eastbound lane.

There was less than one percent banking to the accident curve. Calculations indicated a critical speed of 30 mph for this curve--the rollover threshold for the accident vehicle was calculated to be 22 mph.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's misjudgement of the safe operating speed for his vehicle and load due to inexperience with the vehicle type and roadway terrain. Contributing to the accident was the inappropriate advisory speed sign. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE NO.: 176

Investigation No.: NYC-88-H-T123
Accident Location: Maryland State Route 695, near Chesaco Avenue underpass, Baltimore, Maryland.
Lanes: 4 lanes, divided.
Shoulders: Right, 10 feet; left, 3 feet; both asphalt
Median: 50 feet, grass
Features: At grade, right curve, 4 percent superelevation
Date and Time: August 18, 1988, 3:40 p.m.
Ambient Conditions: Daylight, roadway dry
Heavy Truck Involved: 1988 GMC General tractor in combination with a trailer loaded with two rolls of steel
Motor Carrier: Siegel Transfer, Inc.
Type of Operation: Common Carrier
Size of Operation: 165 power units
Total Weight of Truck: 66,980 pounds (approximate)
Total Length of Truck: 64 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

A 1988 GMC combination carrying two rolls of steel was on a scheduled trip from Sparrows Point, Maryland, to Providence, Rhode Island. The northbound truck was negotiating a rightward 691-foot radius curve when the driver apparently lost control. The vehicle travelled off the left side of the roadway onto the grass median and overturned 180°. Striations in the tiremarks left by the vehicle in the curve indicated that the truck was in yaw prior to leaving the roadway. The speed limit for the highway was 55 mph; 45 mph advisory signs were in place about 600 feet before entering the curve.

The overturn collapsed the cab rearward and rightward about 3 feet 2 inches and crushed the roof of the tractor down to the driver's seat. The unrestrained 64-year-old truckdriver was fatally injured.

The driver had a valid Maryland driver's license at the time of the accident. A check with the Maryland Department of Transportation revealed that from 1974 to 1988 the driver had received 8 citations for speeding, 3 for improper lane change, and was cited twice for driving while under the influence of alcohol or drugs. During the same period he had his license suspended 7 times, revoked once, and received 2 citations for driving with a suspended license. The driver while not licensed in New York, but his privileges were suspended for traffic citations received in that State. He also had an expired Ohio drivers license.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.14 percent alcohol and 1,200 ng/ml of caffeine. No other drugs, as identified by the NTSB testing protocol, were identified.

Baltimore, Maryland
Case No. 1/6

Blood samples from the truckdriver were also tested at the request of the State of Maryland. This test indicated that the blood sample contained 0.15 percent alcohol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's impairment due to alcohol. Contributing to the severity of the accident was the inadequate cab structure of the power unit.

CASE.: 177

Investigation No.: SEA-88-H-TR22
Accident location: Southern Pacific Railway MP 143.5 at a private crossing near Main Street, Soledad, California
Lanes: 1 lane only (at crossing)
Shoulders: None
Median: None
Features: At grade, railroad crossing
Date and Time: September 27, 1988, 10:59 a.m.
Ambient Conditions: Daylight, sunny, clear
Heavy Truck Involved: 1987 Peterbilt conventional 3-axle tractor in combination with an empty 48-foot trailer
Motor Carrier: F & M Trucking Company, Inc.
Type of Operation: Common Carrier
Size of Operation: 8 power units
Total Weight of Truck: 24,000 pounds (approximate)
Total Length of Truck: 60 feet
Other Vehicle Involved: Southern Pacific GP-9 locomotive with 7 cars (414 feet long, pulling 635 tons)

Truck Fatalities: 1
Other Fatalities: 0
Other Fatalities: 0
Other Injuries: 0

FACTUAL SUMMARY:

This accident occurred as the 1987 Peterbilt tractor pulling a van type trailer made a left turn from Front Street onto a traffic way with a double set of railroad tracks. A Southern Pacific Railway freight train, the San Margarita Local, was southbound on the main line (the most easterly of 2 tracks) track. According to the engineer, the train was traveling about 48-49 mph. He applied emergency braking when he realized the truck was not going to stop. The engineer also related that the tractor was approaching the tracks at an angle with the train and he could not see the truckdriver. The combination unit started onto the crossing; the front of the tractor was approximately 3 feet onto the crossing when it was struck by the left front of the locomotive. The front of the tractor was ripped off and the tractor rotated in a counterclockwise direction, coming to rest facing southeast with the tractor and trailer in a jackknife configuration. The train continued southbound in the emergency braking mode, carrying the tractor engine cover on the left front of the locomotive. The front of the locomotive stopped 1500 feet south of the crossing. Flying debris from the tractor struck and damaged a parked pickup truck.

The driver was ejected during the collision and came to rest about 20 feet from the tractor. (One witness related that the driver opened the driver's door prior to being struck, although the "locking jaws" on the door mechanism were bent outward.) A local policeman who arrived on the scene within two minutes was unable to feel a pulse on the truckdriver, and he was pronounced dead at the scene. The official cause of death was listed to be a head injury. The driver was not wearing the available lapbelt. None of the train crew were injured.

Soledad, California
Case No. 177

The truckdriver had driven from Buttonhill, California, to Soledad, California, a distance of approximately 190 miles, on the morning of the accident. He had just departed McDonalds restaurant on the south edge of Soledad several minutes before the crash.

The lead locomotive was driven on its own power back to the yards in Salinas. An examination of the engine revealed damage to the left front near the steps.

The entire front of the 1987 Peterbilt tractor, including the dash and steering wheel, was ripped off by the lead locomotive. According to local police who measured the scene, parts were scattered in a wide area, with the driveshaft coming to rest 140 feet away. A California Highway Patrol commercia vehicle officer conducted a limited inspection, as a complete inspection was not possible, and failed to find any mechanical problems that could be related to the accident. The regular radio in the tractor was found in the "off" position and the citizen's band radio was removed from the truck prior to arrival by the NTSB investigator.

The Southern Pacific Railway in this vicinity consisted of a main line track and a siding 7450 feet long. According to the Western Region Timetable, the speed limit in this vicinity was generally 70 mph for passenger trains and 60 mph for freight. According to current operating rules, this train was only permitted 55 mph. The east approach to the crossing had a "Stop Sign" with a railroad symbol and a "No Trespassing" sign below it. This sign was a type approved by California P.U.C. An additional railroad warning sign was put in place by the property owner which states "Look - Listen -Danger."

Although this was a main line, it was generally only used a few times a day, with two of them being by Amtrak. According to a truck company spokesman, the driver had been using this crossing several times a year for the past 8 years and knew a railroad was there. The truck was en route to X G H Harvesting, just over the crossing on the west side of the tracks, where company employees acknowledged knowing this driver. It is not known whether the driver had ever saw a train at this crossing.

The engineer related to the NTSB investigator that he began blowing his whistle at the "whistle board" (located about 1320 feet north of the crossing). There were four witnesses at their respective places of employment about 200 feet east of the crossing and all of them related that they either heard or saw the crash right after they first heard the whistle. The engineer related that he put the brakes into "emergency" near the south edge of the red building (this was approximately 400 feet from the crossing). Since the front of the train didn't come to a stop until it was 1900 feet beyond the crossing, this means that it took approximately 2300 feet for an 8 unit train traveling 48-49 mph, ascending a slight grade (.2 percent), to come to a complete stop after activating the "emergency" braking system. No testing was done on the braking system of the train.

Soledad, California
Case No. 177

The driver attended a commercial driving school in 1979. Although he worked for this company under its current name since May of 1983, he had worked at the same establishment driving trucks for the past 8 years. A driver record check with the State of Georgia revealed that he had a current Class 2 and 5 driver license, and had 2 speeding tickets in the past 3 years. It did not reveal any accidents. A 50-state record check reveled that he had a current Georgia license and was suspended from driving in Florida for "failure to appear" for a traffic violation. It also revealed that he had once held a valid Alabama license that he let expire in 1975. A check with the National Driver Register (NDR) revealed no revocations or suspensions.

The driver held an expired medical certificate, as his most recent D.O.T. physical examination was August 13, 1986. Official records indicated that the driver had a mild case of diabetes, high blood pressure, and had recently been treated for a back/kidney ailment. However, there was no relationship established between any possible physical problems and this accident. It was also not determined if he was currently taking medication, or being treated for any of these conditions.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's failure, for unkrown reasons, to stop short of the tracks and yield to the passing train.

CASE NO.: 178

Investigation No.: OEN-88-K-TR24
Accident Location: State Road 45, 9 miles south of Hamilton City, California
Lanes: 2-lane, undivided
Shoulders: 3 feet, gravel--both sides
Median: None
Features: At grade
Date and Time: September 30, 1988, 6:15 a.m.
Ambient Conditions: Clear, dry, dark
Heavy Truck Involved: 1971 Kenworth tractor in combination with two loaded 24-foot flatbed trailers
Motor Carrier: G. A. Hanks and Sons
Type of Operation: Common Carrier
Size of Operation: 7 power units
Total Weight of Truck: 79,500 pounds (approximate)
Total Length of Truck: 56 feet (approximate)
Other Vehicle Involved: 1978 Ford F250 pickup
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 1

FACTUAL SUMMARY:

The 1971 Kenworth combination was traveling north on State Road 45 at a witness stated speed of 45 mph. A 1978 Ford pickup travelling west on County Road 32 pulled into the path of the Kenworth. Westbound traffic at the intersection was controlled by a stop sign. A witness stated that the Ford did not stop for the stop sign before entering the intersection at approximately 15 mph. The Kenworth struck the left rear side of the Ford in an area located three feet east and fifteen feet south of the center of the intersection in the northbound traffic lane. After impact, the Kenworth traveled in a northwesterly direction, leaving 115 feet 6 inches of scrape, gouge, and locked wheel skidmarks to the west edge of the roadway. The vehicle then traveled for another 24 feet in the west ditch to where it came to rest with the tractor inverted, facing southwest. The right front wheel was 21 feet west of the west edge of S.R. 45 and 68 feet north of the north edge of County Road 32. The left rear wheel of the tractor was located 11 feet west of the west edge of S.R. 45 and 75 feet north of the north edge of County Road 32. The semitrailer also came to rest inverted, facing in a southerly direction along the west edge of the road. The pull trailer came to rest on its right side facing west in the southbound lane of S.R. 45. After impact, the Ford traveled in a northwesterly direction for 75 feet to where it struck and came to rest against a tree, with the left front wheel 37 feet west of the west edge of S.R. 45 and 23 feet north of the north edge of County Road 32. There was no evidence of either vehicle leaving any locked wheel skidmarks before impact.

The unrestrained driver of the Kenworth was entrapped in the tractor and received fatal injuries. The unrestrained driver of vehicle #2 remained in the vehicle and received serious injuries. The tractor and semitrailer were destroyed while the second trailer received moderate damage. The Ford received moderate damage to the left side and minor damage to the front.

Hamilton City, California
Case No. 178

The Kenworth driver had 24 years of heavy truck driving experience. He had received formal training with heavy trucks while in the army. He drove for the company from July to November each year. A three year driving record check revealed a conviction for driving while under the influence on March 12, 1985, and for speeding on May 5, 1987. There was no record of accidents during this time. A check of the driving record for the pickup driver revealed seven convictions for traffic violations since 1981 and an accident on September 9, 1987.

There was no record of the carrier having been audited by either the Department of Transportation or California State Public Utilities Commission. The carrier mainly hauled its own produce from the fields to the local mill but did hire out when called. The carrier had been in business since 1951.

Blood samples from the Kenworth Driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained unquantified amounts of caffeine and salicylate (aspirin). No other drugs, as identified by the NTSB testing protocol, were identified.

Toxicological tests of blood samples from the Kenworth driver were not conducted by the State of California.

Blood samples from the driver of the Ford were sent to the CHT for testing. CHT determined that this driver's blood contained 10 ng/ml of the non-psychoactive component of marijuana (COOH-THC). No other drugs, as identified by the NTSB testing protocol, were identified. However, it was noted that the blood sample was not of sufficient quantity to test for BASES, anticonvulsants, and analgesics.

Blood samples from the Ford driver were also tested at the request of the State of California. This screening test revealed the presence of marijuana (THC).

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the Ford driver's failure, for unknown reasons to yield the right-of-way at a controlled intersection. Contributing to the accident severity was the inadequate cab structure of the Kenworth power unit.

CASE NO.: 179

Investigation No.: MKC-88-H-TR24
Accident Location: State Route 32 near Plymouth, North Carolina
Lanes: 2 lanes, undivided
Shoulders: Right, 7 feet; left, 9 feet; both earthen
Median: None
Features: At grade, level
Date and Time: August 8, 1988, 7:48 a.m.
Ambient Conditions: Cloudy
Heavy Truck Involved: 1983 Ford F-350 straight truck
Motor Carrier: Pamlico Distributing Co.
Type of Operation: Private Carrier
Size of Operation: 5 straight trucks
Total Weight of Truck: 10,000 pounds
Total Length of Truck: 22 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1983 Ford F-350 straight truck was northbound on NC-32. Just prior to reaching the city limits of Plymouth, North Carolina, the vehicle traveled onto the right shoulder. It traveled 462 feet along the shoulder and struck a driveway which was about 12 inches higher than the shoulder. The vehicle then became airborne for 42 feet. It continued northbound for 66 feet where it struck a tree with the left front. The vehicle continued north for approximately 12 feet and came to rest on its wheels, bridging a shallow ditch.

The left "A-pillar" was displaced rearward and inboard into the driver's compartment. The left door was crushed inward and the dash was bowed upward toward the windshield. The cases of wine coolers that were in the cargo area came forward against the bulkhead where the passenger compartment was attached to the cargo area, causing a separation of the van body at the left front corner. Also, there was an opening between the front seats to access the cargo area without getting out of the van. During the impact, some of the cargo traveled forward into the driver's compartment. The driver was fatally injured.

This driver had no formal commercial driver training. He had worked for this company for four years, which was the sum of his commercial driving experience. This driver had no violations or accidents for the past three years. A 50-state driver record check was negative.

The driver had surgery in 1971 for the removal of a lesion on the pineal gland. It was the doctor's opinion that, at the time of the accident, the driver was partially or fully disabled as a result of complications from the brain surgery, causing him to lose control of the vehicle. However, he died as a result of internal injuries suffered in the accident.

Plymouth, North Carolina
Case No. 179

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that the blood sample contained 0.02 percent alcohol and 1,600 ng/ml of psuedoephedrine. No other drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the driver were also tested at the request of the State of North Carolina with negative results.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the physical incapacitation of the driver due to his medical condition (resulting from brain surgery). Possibly contributing to the incapacitation was the high concentration of psuedoephedrine.

CASE NO.: 180

Investigation No.: SEA-88-H-TR23
Accident Location: County Road 29, near Davis, California
Lanes: 2 lanes, undivided
Shoulders: Right, 6-10 feet; left, 6-10 feet; both dirt and gravel
Median: None
Features: At grade, level, straight
Date and Time: August 31, 1988; 9:30 a.m.
Ambient Conditions: Daylight, no adverse weather conditions
Heavy Truck Involved: 1977 Lodal 2-axle garbage truck
Motor Carrier Involved: Davis Waste Removal Company, Inc.
Type of Carrier: Private Carrier
Size of Operation: 37 power units, 2 straight trucks)
Total Weight of Truck: 21,680 pounds
Total Length of Truck: 24 feet
Other Vehicles Involved: 4 parked vehicles (cars/pickups)
Truck Fatalities: 1 Truck Injuries: 1
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

This accident occurred as the Lodal garbage truck was eastbound on County Road 29 enroute to a refuse dump. The driver was standing while operating the truck. A tiremark was observed near the broken center line leading about 1.5 to 2 feet into the westbound lane, crossing back into the eastbound lane and continuing to the right edge of the roadway. The truck went off the right side of the roadway into a private parking area, striking parked vehicles, and then the left front of the garbage truck struck a 2.5-foot diameter tree. After striking the first parked vehicle, the exact sequence of damage and pattern of dynamics to the parked vehicles were not analyzed by the NTSB, nor were the parked vehicles examined. The NTSB did not learn of this accident until October 11, 1988, approximately 6 weeks after its occurrence.

The truck sustained severe damage to the ont, left front, and driver's door area. A "ball stud" which connects the right side of the hydraulic steering booster cylinder to a mounting plate on the front axle broke off, thus displacing the hydraulic cylinder from its normal horizontal position. During a visual examination of the "ball stud" fracture by the NTSB investigator, only a clear granular surface was observed. According to the carrier's shop manager, if this fracture had occurred prior to impact, it would still leave the manual steering operative. He also related that he has driven this model truck with the power steering inoperative and the only problem he detected was that it was hard to turn at lower speeds. It should be noted that this truck was equipped with front wheel drive. The refuse container on this truck was centered over the rear axle and extends 7.5 feet behind it.

The driver, who was standing while driving, was unrestrained. The driver was pronounced dead at the scene--the cause of death was listed by the pathologist to be "Crushing Chest Injuries." He also sustained multiple rib fractures and a compound fracture of the right leg.

Davis, California
Case No. 180

A witnesses travelling in the opposite direction related to the California Highway Patrol that the truck was weaving and traveling about 80 mph. However, company officials related that the vehicle was capable of speeds of only 45 to 50 mph. The 1977 Lodal was equipped with a 318 cubic inch Chrysler engine and a 4 speed Allison automatic transmission. The NTSB investigator went for a test ride in another Lodal truck of the same model which was similarly equipped. The top speed attained by this empty vehicle was 48 mph on level ground.

There was a rough pavement edge on the right side of the roadway which began approximately 150 feet prior to where the truck left the roadway. This rough edge was visible in photos taken at the scene on the date of the accident. This condition was repaired prior to the arrival of the NTSB investigator.

The 1977 Lodal was equipped with two operator's compartments, and can be driven from either the left or right side. Each compartment has a steering wheel, accelerator, and foot brake. The transmission lever and emergency brake were located on top of a central console. The steering mechanism on the right side was connected to the steering box (located on the left side) with a heavy duty "roller chain," similar to a motorcycle drive chain. Company policy dictated that the right side position be used only for urban garbage collections when the truck has frequent stops and was driven at slow speeds. In this instance, the driver was occupying the left compartment and was standing while driving, a common practice in this vehicle.

The driver started to work for this company on August 30th, the day prior to the accident. On his first day, after being instructed on how to give the truck a safety check, he drove the truck on the company premises for about one hour. He was then taken out with a route supervisor for about 2.5 hours. This was the only known instruction he had with another driver in the vehicle. The next day he followed a route supervisor, who was in another vehicle, and was led to a section of town where he would pick up garbage, then team up with another driver and follow him to the landfill. He was following another vehicle on his way to the landfill when the accident occurred. The company route supervisor who trained the driver related that he cautioned him on the previous day about driving too close to the right edge of the roadway. According to the driver's wife, the only prior truckdriving experience he had was driving a truck for a friend a couple of times a year.

A driver record check with the State of California revealed no violations or accidents during the past 3 years. A 50-state check revealed that the driver held only a California drivers license.

Blood samples from the driver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. CHT determined that

the blood sample contained 1,700 ng/ml of caffeine. No other drugs, as identified by the NTSB toxicological protocol, were identified.

Blood samples from the driver were also tested at the request of the State of California with negative results. The driver had a D.O.T. physical examination just 2 days prior to the accident and no medical problems were noted.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the driver's inexperience with the unique operating characteristics of the truck.

CASE NO.: 181

Investigation No.: DEN-88-H-TR25
Accident Location: U.S. 82, 3 miles east of Pearson, Georgia
Lanes: 4 lanes, divided
Shoulders: Both sides, 9 feet, earthen
Median: 50 feet wide, earthen
Features: At grade
Date and Time: August 31, 1988, 4:40 p.m.
Ambient Conditions: Cloudy, wet
Heavy Truck Involved: 1977 International tractor towing a pick-up truck
Motor Carrier: Better Buy Mobile Homes
Type of Operation: Private carrier
Size of Operation: 3 power units
Total Weight of Truck: 14,700 pounds (approximate)
Total Length of Truck: 38 feet (approximate)
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 1
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The 1977 International tractor towing a one ton escort pick-up was traveling east on U.S. Highway 82. At a point three miles east of Pearson, Georgia, the vehicle went off the right edge of the road, traveled for a short distance along the right shoulder, and then came back onto the traveled portion of the road. The vehicle then traveled in a northeasterly direction, leaving 128 feet of skid/scuff marks while crossing both eastbound lanes. It then traveled for another 151 feet in a northeasterly direction through the median, while simultaneously overturning. The vehicle came to rest on its right side in the westbound traffic lanes with the right rear wheel six feet north of the south edge of the westbound traffic lanes. The towed vehicle broke loose and continued northeast for 112 feet, coming to rest in the north ditch. According to the passenger, the vehicle was traveling at 55 mph when it went off the right edge of the road. The highway was being resurfaced at the time and had a 6 to 8 inch drop from the paved section to the shoulder. It had rained earlier and the road was wet.

The accident resulted in fatal injuries to the unrestrained driver who was partially ejected through the right window. The unrestrained passenger was ejected during the accident sequence and received minor injuries. The tractor received substantial damage, with the cab being torn loose from the frame. The towed vehicle received only minor damage.

The driver had 16 years of heavy truck driving experience. He had been employed with the company for 2 1/2 years. A three year check of the driver's driving record revealed no traffic convictions or accidents. A check of the National Driver Register was negative.

This driver normally worked a dayshift schedule which allowed sufficient rest each night. However, on the date of the accident, he had began his day at 3 a.m. instead of the usual 6:30 a.m.

Pearson, Georgia
Case No. 181

The passenger stated that they stopped for a lunch break and purchased a 12-pack of beer 2.5 hours before the accident. According to the passenger, the driver consumed five or six cans of beer before the accident occurred.

The carrier did not maintain a driver's file on the driver, nor did they keep maintenance records on the accident vehicle as required by the Georgia State Public Service Commission. There was no record of the carrier having been audited by the Department of Transportation or the Georgia State Public Service Commission.

The accident occurred in a construction zone. There was a 45 mph recommended safe speed sign posted at the beginning of the construction zone. There were also "low shoulder" signs posted along both edges of the traveled road surface for a distance of one mile before the accident site.

The vehicle was inspected by an officer from the Atkinson County Sheriff Department and no mechanical defects were noted. Due to the delay in notification, the vehicle had been salvaged for parts and no NTSB examination was conducted.

Blood samples from the truckdriver were not sent to the Center for Human Toxicology.

Blood samples from the truckdriver were tested at the request of the State of Georgia. This test indicated that the driver's blood contained 0.10 percent alcohol.

PROBABLE CAUSE:

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's impairment due to alcohol use and fatigue. Contributing to the accident was a drop of 6 to 8 inches from the pavement to the shoulder and excessive speed for the construction zone.

CASE NO.: 182

Investigation No.: LAX-89-H-TR01
Accident Location: I-710 at Clara Street Overcrossing, Bell, California
Lanes: 8 lanes, divided
Shoulder Right shoulder, 8 feet wide asphalt surface
Median: Blocked-out "W-beam" guardrail with glare screen
Features: At grade, straight, level
Date and Time: September 14, 1988, 7:15 a.m.
Ambient Conditions: Daylight, dry, cloudy, 60°F
Heavy Truck Involved 1977 White Freightliner 3-axle COE tractor
Motor Carrier: U.S. Hyundai Transportation
Type of Operation: Contract Carrier
Size of Operation: 6 power units
Total Weight of Truck: 15,500 pounds
Total Length of Truck: 18 feet
Other Vehicle Involved: None
Truck Fatalities: 1 Truck Injuries: 0
Other Fatalities: 0 Other Injuries: 0

FACTUAL SUMMARY:

The White Freightliner tractor was observed by witnesses to be traveling southbound on I-710 in the acceleration lane south of the Florence Avenue overcrossing at approximately 35-40 mph. The acceleration lane merges into the southbound #4 lane of I-710 north of the Clara Street overcrossing. The tractor was observed following a Volkswagon which slowed suddenly as it attempted to merge with the southbound I-710 traffic flow. The physical evidence on the roadway indicated that the tractor locked its brakes and skidded to the right into a two foot high blocked-out "W-beam" guardrail. The momentum of the vehicle carried it along the guardrail, up a dirt embankment, and into the concrete north face of the Clara Street overcrossing abutment. The unrestrained driver died as a result of his injuries. The Volkswagon observed by witnesses did not stay at the accident scene, nor was it identified. Tire marks found on the roadway were identified by the California Highway Patrol as locked wheel skids and were attributed to the 3-axle tractor. The length of the tire marks were recorded as right side dual marks 80 feet in length and a left side single mark 50 feet in length. Both marks terminated approximately 71 feet north of the Clara Street overcrossing. Further, at the termination of the tire marks at the roadway shoulder the vehicle traveled approximately 20 feet to the guardrail where it climbed the metal beam and slid in the soft dirt embankment for a distance of approximately 50 feet before striking the concrete abutment.

The coroner's investigator's report revealed that the driver was found "jammed against the steering wheel which was bent from the force of impact, the driver's seat was twisted forward. His head and chest showed massive damage from the impact with the steering wheel and windshield." Major damage was sustained by the cab due to rearward deformation. Additionally, the engine, transmission, drive line, and suspension were separated from their mountings to the vehicle frame.

Los Angeles, California
Case No. 182

According to his wife, the driver was enroute to work at U.S. Hyundai and had just left home. Carrier officials related that the driver was employed by them in July 1988, and that they were expecting him to report to work on the morning of September 14, 1988. The son of the accident driver related that he and his dad drove heavy trucks for a living, and that his dad taught him. Further, he related that his dad drove combination vehicles in Mexico for eight years and had driven in the USA for two years. A search of the California Department of Motor Vehicle files indicated that the current Class I operator's license in the drivers possession was issued on 1-13-87 and was due to expire in 1990.

The record listed four moving traffic violations and four violations of an administrative nature. The abstract also revealed that he was involved in one accident in a passenger vehicle in February 1988. His license was void of any restrictions. A 50-state check and a National Driver Register check were completed, and the driver was not found to be suspended, revoked, or licensed in any other state.

The 3-axle tractor was equipped with a air/mechanical brake system. The front axle lining was approximately 50 percent. The brake lining on axle number two had approximately 70 percent remaining. The lining available on axle number three was approximately 50 percent on the left and 40 percent on the right. Due to the extensive damage to the vehicle, the brake adjustment could not be determined. A visual inspection revealed no major oil leaks or brake contamination, and in general the vehicle appeared to be well maintained.

The carrier had been in interstate operation for two years. An examination revealed that the carrier did not maintain maintenance records on leased vehicles nor qualification files on leased or casual operators. As a rule the carrier hired casual drivers as the need arose, with little or no background investigation on the driver or the equipment. The accident vehicle, under verbal contract to the carrier as agreed to by the vehicle's owner, was not insured. The carrier leased the vehicle and driver without prior verification of liability coverage from the vehicle's owner. The owner of the accident vehicle drove another tractor, which he owned, for the same carrier. The carrier had never been audited by State authorities.

Blood samples from the truckdriver were sent to the Center for Human Toxicology (CHT) at the University of Utah for screening, confirmation, and quantification according to the toxicological protocol. No drugs, as identified by the NTSB testing protocol, were identified.

Blood samples from the truckdriver were also tested at the request of the State of California with negative results.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the truckdriver's inappropriate evasive action as he attempted to avoid the slow moving passenger car.

APPENDIX A

GLOSSARY OF TERMS AND ABBREVIATIONS

This glossary briefly describes certain terms, as they are used throughout the case summaries, that may be unfamiliar to the reader. Many of the definitions are transcribed directly from the Federal Motor Carrier Safety Regulations, others are taken from industry publications.

AASHTO--American Association of State Highway and Transportation Officials

BAC--blood alcohol content

BAL--blood alcohol level

BMCS--Bureau of Motor Carrier Safety. (Now the Office of Motor Carriers)

COE--cab-over-engine; A tractor with the cab positioned over the engine.

Combination--a highway vehicle composed of two or more detachable units, such as a tractor and semitrailer or a tractor, a semitrailer, and a full trailer.

Common carrier--a for-hire trucking company that offers its transportation services to the general public on an equal basis.

Contract carrier--a for-hire trucking company that provides a specialized transportation service under contract with one, or a limited number of, shipper(s).

Conventional cab--a tractor with the cab positioned behind the engine.

Converter dolly--a device used as an auxiliary axle for conversion of a semitrailer to a full trailer. Used to couple the trailers of a multiple trailer combination.

DOT--Department of Transportation

Doubles combination. A tractor in combination with a semitrailer and a full trailer.

EPA--Environmental Protection Agency

Exempt carrier--common or contract carriers of property which is exempt from economic regulation.

Fifth wheel--matching plates mounted above the rear frame of a tractor and below the front end of a semitrailer, with a vertical connecting pin, that bears the weight of the front end of a semitrailer and is the pivot point between the two vehicles.

APPENDIX A

FMCSR--Federal Motor Carrier Safety Regulations

Full trailer--any motor vehicle, with or without motive power, other than a "pole trailer," designed to be drawn by another motor vehicle and so constructed that no part of its weight except the towing device rests on the towing vehicle. A semitrailer equipped with an auxiliary front axle (dolly) shall be deemed a "full trailer."

GADOT--Georgia Department of Transportation

ICC--Interstate Commerce Commission

Motor carrier--except as otherwise specifically provided, the term "motor carrier" includes a common carrier by motor vehicle, a contract carrier by motor vehicle, and a private carrier of property by motor vehicle.

NTSB--National Transportation Safety Board

OMC--Office of Motor Carriers

Owner-Operator--an individual who owns and operates his own truck as a business.

Pintle hook--an attachment unit, consisting of a latching hook at the rear of a vehicle coupled to a drawbar eyehook extending from a full trailer in tow.

Pole trailer--the term "pole trailer" means any vehicle without motive power, possibly of variable wheelbase, designed to be drawn by another motor vehicle, and attached to the towing vehicle by means of a "reach," or "pole," or by being "boomed" or otherwise secured to the towing vehicle, and ordinarily used for transporting long or irregular-shaped loads such as poles, pipes, or structural members capable generally of sustaining themselves as beams between the supporting connections.

Power unit--see "truck tractor"

Private carrier--any person or entity, who or which transports property by motor vehicle which it owns, leases, is bailee of, or is in the furtherance of that person's commercial enterprise.

Semitrailer--any motor vehicle other than a "pole trailer," with or without motive power, designed to be drawn by another motor vehicle and so constructed that some part of its weight rests upon the towing vehicle.

Straight truck--a truck with the engine, cab, and freight compartment all on the same frame.

Trailer--the cargo-carrying unit in a combination truck.

Truck--any self-propelled motor vehicle except a truck tractor, designed and used, or exclusively used whether or not so designed, for the transportation of property.

Truck tractor--a self-propelled motor vehicle designed and used primarily for drawing other vehicles and not so constructed as to carry a load other than a part of the weight of the vehicle and load so drawn. Also referred to as "power unit."

Twin trailer combination--see "doubles combination"

Vehicle--any conveyance of any type whatsnever operated upon the highways.

APPENDIX B

PHASE II HEAVY TRUCK INVESTIGATIONS

CASE NUMBER	REGIONAL OFFICE NUMBER	DATE	TIME	LOCATION
001	LAX-88-H-TR01	10/02/87	3:00 PM	MONTEREY PARK, CA
002	LAX-88-H-TR02	10/05/87	5:40 PM	FRESNO, CA
003	ATL-88-H-TR01	10/06/87	8:05 AM	NEW BERN, NC
004	MKC-88-H-TR01	10/08/87	9:30 AM	JACKSON, TN
005	DEN-88-H-TR01	10/09/87	3:52 AM	PAGOSA SPRINGS, CO
006	ATL-88-H-TR02	10/10/87	11:15 PM	MIDWAY, GA
007	SEA-88-H-TR01	10/12/87	10:35 AM	GREENFIELD, CA
008	SEA-88-H-TR02	10/13/87	12:40 PM	KYBURZ, CA
009	LAX-88-H-TR03	10/16/87	8:10 AM	LACANADA, CA
010	FTW-88-H-TR01	10/16/87	2:40 PM	FOUR OAKS, NC
011	CHI-88-H-TR01	10/19/87	6:41 AM	BRISTOL, WI
012	LAX-88-H-TR01	10/20/87	3:50 PM	BURBANK, CA
013	LAX-88-H-TR05	10/25/87	10:30 PM	FORT TEJON, CA
014	ATL-88-H-TR03	10/27/87	7:00 PM	BLAKELY, GA
015	NYC-88-H-TR01	10/29/87	7:15 AM	BELVEDERE, NJ
016	SEA-88-H-TR03	10/29/87	5:15 AM	TRACY, CA
017	SEA-88-H-TR04	11/02/87	1:50 AM	BAKERSFIELD, CA
018	LAX-88-H-TR06	11/02/87	3:45 PM	NEWHALL, CA
019	DEN-88-H-TR02	11/02/87	11:55 PM	PIXLEY, CA
020	NYC-88-H-TR02	10/05/87	1:00 AM	WASHINGTON COUNTY, MD
021	NYC-88-H-TR03	10/23/87	11:15 AM	BALTIMORE COUNTY, MD
022	CHI-88-H-TR02	10/28/87	3:15 PM	MOSCOW, MD
023	ATL-88-H-TR04	11/09/87	10:15 AM	OLD FORT, NC
024	LAX-88-H-TR07	11/09/87	10:25 AM	LONG BEACH, CA
025	CHI-88-H-TR03	11/23/87	11:25 AM	EDEN, WI
026	NYC-88-H-TR05	11/28/87	9:30 AM	MONTGOMERY COUNTY, MD
027	MKC-88-H-TR02	12/03/87	4:15 AM	LOS ANGELES, CA
028	DEN-88-H-TR03	12/04/87	8:25 AM	WESTLEY, CA
029	SEA-88-H-TR05	12/04/87	2:25 PM	STOCKTON, CA
030	LAX-88-H-TR08	12/09/87	8:20 AM	DELANO, CA
031	FTW-88-H-TR02	12/11/87	5:50 AM	BAKERSFIELD, CA
032	SEA-88-H-TR06	12/12/87	12:15 AM	VISALIA, CA
033	DEN-88-H-TR04	12/14/87	7:41 AM	SANTA CRUZ, CA
034	MKC-88-H-TR03	12/15/87	5:30 AM	LONE PINE, CA
035	ATL-88-H-TR05	12/14/87	1:35 PM	ATLANTA, GA
036	CHI-88-H-TR04	12/14/87	4:10 PM	RIPON TOWNSHIP, WI
037	MKC-88-H-TR04	11/14/87	10:25 AM	MEMPHIS, TN

APPENDIX B

CASE NUMBER	REGIONAL OFFICE NUMBER	DATE	TIME	LOCATION
038	ATL-88-H-TR06	10/27/87	6:00 PM	ATLANTA, GA
039	FTW-88-H-TR03	01/02/88	5:30 PM	SOLEDAD, CA
040	DEN-88-H-TR05	01/05/88	3:25 PM	WALSH, CO
041	MKC-88-H-TR05	01/06/88	5:30 AM	CLINTON, TN
042	LAX-88-H-TR09	01/08/88	11:50 PM	MOJAVE, CA
043	NYC-88-H-TR06	01/09/88	2:25 AM	BALTIMORE, MD
044	DEN-88-H-TR06	01/09/88	6:00 AM	DEL MAR, CA
045	CHI-88-H-TR06	01/12/88	6:12 PM	PLATTEVILLE, WI
046	NYC-88-H-TR07	01/13/88	4:45 AM	SOMERSET COUNTY, NJ
047	SEA-88-H-TR07	01/20/88	9:30 AM	HANFORD, CA
048	LAX-88-H-TR10	10/02/87	11:05 AM	YUCCA VALLEY, CA
049	ATL-88-H-TR07	02/03/88	6:55 AM	STATESVILLE, NC
050	ATL-88-H-TR08	02/10/88	4:50 AM	BOLIVIA, NC
051	MKC-88-H-TR06	02/10/88	7:40 PM	CLARKSVILLE, TN
052	CHI-88-H-TR07	02/25/88	9:20 AM	DANE COUNTY, WI
053	MKC-88-H-TR07	02/26/88	5:20 AM	SCOTTS HILL, TN
054	CHI-88-H-TR08	02/25/88	4:10 PM	WAUSAU, WI
055	FTW-88-H-TR04	03/01/88	12:20 AM	BEAUMONT, CA
056	NYC-88-H-TR09	03/03/88	6:05 AM	BELLMAWR, NJ
057	DEN-88-H-TR07	03/03/88	9:50 PM	WALKER, CA
058	SEA-88-H-TR08	03/03/88	1:50 PM	NILAND, CA
059	CHI-88-H-TR09	03/10/88	10:16 AM	ABRAMS, WI
060	DEN-88-H-TR08	11/06/87	2:36 PM	PLEASANT HILL, CA
061	SEA-88-H-TR09	03/16/88	1:25 PM	DEL MAR, CA
062	CHI-88-H-TR10	03/16/88	11:30 PM	EAU CLAIRE COUNTY, WI
063	SEA-88-H-TR10	03/21/88	1:20 PM	CARLSBAD, CA
064	DEN-88-H-TR09	03/28/88	7:25 AM	GOLDEN, CO
065	MKC-88-H-TR08	03/22/88	10:30 AM	POPE VALLEY, CA
066	MKC-88-H-TR09	03/31/88	3:05 PM	NASHVILLE, TN
067	MKC-88-H-TR10	04/09/88	2:30 AM	KINGSTON, TN
068	ATL-88-H-TR09	04/18/88	2:15 AM	COMMERCE, GA
069	LAX-88-H-TR11	04/20/88	3:00 PM	MECCA, CA
070	SEA-88-H-TR11	04/23/88	3:30 AM	DOS PALOS, CA
071	LAX-88-H-TR12	04/23/88	10:50 AM	BELLFLOWER, CA
072	LAX-88-H-TR13	01/25/88	8:55 AM	LANCASTER, CA
073	MKC-88-H-TR11	02/23/88	4:35 PM	NORTH FORK, CA
074	ATL-88-H-TR10	04/26/88	1:00 PM	WELDON, NC
075	DEN-88-H-TR10	04/26/88	8:15 AM	SAN BERNARDINO, CA
076	SEA-88-H-TR12	04/27/88	10:10 AM	CHUALAR, CA
077	FTW-88-H-TR06	05/03/88	6:15 AM	DUNSMUIR, CA
078	MKC-88-H-TR12	03/22/88	2:25 PM	BAKER, CA

APPENDIX B

CASE NUMBER	REGIONAL OFFICE NUMBER	DATE	TIME	LOCATION
079	ATL-88-H-TR11	05/14/88	2:10 AM	ASHEVILLE, NC
080	ATL-88-H-TR12	05/16/88	3:40 PM	MARION, NC
081	CHI-88-H-TR11	05/17/88	1:35 PM	FOND DU LAC COUNTY, WI
082	DEN-88-H-TR11	05/20/88	4:42 AM	TRACY, CA
083	MKC-88-H-TR13	05/23/88	5:40 AM	BAILEYTOWN, TN
084	DEN-88-H-TR12	05/23/88	1:30 PM	GALT, CA
085	ATL-88-H-TR13	05/25/88	3:40 AM	MORROW, GA
086	SEA-88-H-TR13	05/26/88	4:40 AM	CROSSVILLE, GA
087	FTW-88-H-TR07	05/28/88	11:40 AM	NILAND, CA
088	MKC-88-H-TR14	05/31/88	11:40 AM	CLEVELAND, TN
089	NYC-88-H-TR12	05/31/88	2:20 PM	BELLCAMP, MD
090	CHI-88-H-TR12	06/03/88	8:08 AM	KENOSHA, WI
091	LAX-88-H-TR14	06/03/88	3:15 PM	THERMAL, CA
092	MKC-88-H-TR15	06/05/88	10:00 PM	CRAB ORCHARD, TN
093	CHI-88-H-TR13	06/08/88	7:38 AM	LADYSMITH, WI
094	LAX-88-H-TR15	05/16/88	1:22 PM	WRIGHTWOOD, CA
095	MKC-88-H-TR16	06/09/88	1:30 PM	BYRDSTOWN, TN
096	CHI-88-H-TR14	06/10/88	4:15 PM	WITHEE, WI
097	ATL-88-H-TR14	06/13/88	6:30 PM	NEW BERN, NC
098	SEA-88-H-TR14	06/16/88	4:40 AM	PALM SPRINGS, CA
099	DEN-88-H-TR13	06/15/88	9:25 AM	TRUCKEE, CA
100	DEN-88-H-TR14	06/20/88	4:15 AM	BEAUMONT, CA
101	LAX-88-H-TR16	07/06/88	5:54 AM	WHEELER RIDGE, CA
102	LAX-88-H-TR17	07/07/88	12:20 AM	CABAZON, CA
103	FTW-88-H-TR08	07/07/88	2:20 PM	COOKEVILLE, TN
104	SEA-88-H-TR15	07/07/88	4:50 PM	VINA, CA
105	ATL-88-H-TR15	07/11/88	7:20 PM	AHOSKIE, NC
106	DEN-88-H-TR15	07/11/88	10:30 PM	MENDOTA, CA
107	ATL-88-H-TR16	07/11/88	8:40 PM	IRWINTON, GA
108	CHI-88-H-TR16	07/14/88	9:50 AM	COVINGTON, TN
109	DEN-88-H-TR16	07/13/88	6:15 AM	REDDING, CA
110	FTW-88-H-TR09	07/20/88	9:10 PM	TAFT, CA
111	NYC-88-H-TR14	07/25/88	2:50 AM	HALETHORPE, MD
112	CHI-88-H-TR17	07/21/88	5:00 AM	POLK COUNTY, TN
113	CHI-88-H-TR18	07/23/88	1:20 AM	EAST RIDGE, TN
114	ATL-88-H-TR17	07/26/88	7:15 PM	CLYDE, NC
115	SEA-88-H-TR16	07/27/88	5:35 AM	CUYAMA, CA
116	CHI-88-H-TR19	07/27/88	10:25 PM	SOLON SPRINGS, WI
117	ATL-88-H-TR18	07/27/88	5:15 PM	WINDSOR, NC
118	DEN-88-H-TR17	07/27/88	4:33 PM	CLAREMONT, NC
119	ATL-88-H-TR19	07/27/88	7:22 AM	MARIETTA, GA

APPENDIX B

CASE NUMBER	REGIONAL OFFICE NUMBER	DATE	TIME	LOCATION
120	LAX-88-H-TR18	08/02/88	5:00 AM	BUTTON WILLOW, CA
121	CHI-88-H-TR20	07/29/88	10:36 AM	GLENDALE, WI
122	MKC-88-H-TR17	08/02/88	11:10 AM	BRISTOL, TN
123	FTW-88-H-TR11	08/08/88	5:40 AM	TRACY, CA
124	FTW-88-H-TR10	08/04/88	1:10 PM	SIERRAVILLE, CA
125	NYC-88-H-TR15	04/07/88	10:40 AM	MORRISTOWN, NJ
126	NYC-88-H-TR16	04/18/88	11:44 AM	ELK TOWNSHIP, NJ
127	NYC-88-H-TR17	05/17/88	11:00 PM	JEFFERSON TOWNSHIP, NJ
128	LAX-88-H-TR19	04/04/88	1:15 PM	WALNUT, CA
129	FTW-88-H-TR12	11/02/87	2:20 PM	DENTON, NC
130	ATL-88-H-TR20	11/14/87	12:06 AM	WINSTON-SALEM, NC
131	FTW-88-H-TR13	11/19/87	12:49 AM	GASTONIA, NC
132	ATL-88-H-TR21	12/14/87	2:18 PM	CARY, NC
133	FTW-88-H-TR14	03/22/88	7:35 PM	LINCOLNTON, NC
134	ATL-88-H-TR22	04/06/88	6:30 AM	BLADENBORO, NC
135	DEN-88-H-TR18	12/29/87	2:04 PM	WAYCROSS, GA
136	DEN-88-H-TR19	01/21/88	11:15 AM	ADEL, GA
137	DEN-88-H-TR20	01/26/88	10:50 AM	BAXLEY, GA
138	ATL-88-H-TR23	02/14/88	6:55 PM	MACON, GA
139	ATL-88-H-TR24	02/19/88	10:50 PM	WARM SPRINGS, GA
140	CHI-88-H-TR21	02/24/88	8:52 AM	CARTERSVILLE, GA
141	ATL-88-H-TR25	03/15/88	7:40 PM	PERRY, GA
142	DEN-88-H-TR21	03/21/88	1:20 PM	GUYTON, GA
143	CHI-88-H-TR22	03/21/88	1:50 PM	DALTON, GA
144	ATL-88-H-TR26	03/22/88	12:15 PM	TALLAPOOSA, GA
145	CHI-88-H-TR23	04/21/88	6:30 AM	CANTON, GA
146	CHI-88-H-TR24	04/23/88	5:15 PM	CLARKSVILLE GA
147	ATL-88-H-TR27	05/31/88	10:20 AM	COLUMBUS, GA
148	ATL-88-H-TR28	06/07/88	11:15 PM	ATTAPULGUS, GA
149	NYC-88-H-TR18	08/10/88	11:58 AM	MITCHELL COUNTY, NC
150	ATL-88-H-TR29	08/11/88	10:15 PM	PINE MOUNTAIN, GA
151	NYC-88-H-TR19	08/12/88	8:34 AM	BELLMAWR, NJ
152	SEA-88-H-TR17	08/13/88	11:07 PM	LATHROP, CA
153	MKC-88-H-TR18	04/23/88	12:01 AM	ADAMSVILLE, TN
154	MKC-88-H-TR19	04/25/88	11:20 AM	MEMPHIS, TN
155	MKC-88-H-TR20	05/12/88	12:40 PM	DUNLAP, TN
156	DEN-88-H-TR22	08/16/88	8:30 AM	KERMAN, CA
157	LAX-88-H-TR20	08/18/88	3:00 AM	BLYTHE, CA
158	NYC-88-H-TR21	08/19/88	6:20 AM	CAMP SPRINGS, MD
159	SEA-88-H-TR18	08/22/88	4:45 PM	TRACY, CA
160	ATL-88-H-TR30	07/25/88	6:50 AM	DARIEN, GA

APPENDIX B

CASE NUMBER	REGIONAL OFFICE NUMBER	DATE	TIME	LOCATION
161	ATL-88-H-TR31	07/26/88	3:00 PM	LEXINGTON, GA
162	DEN-88-H-TR23	08/29/88	3:25 PM	LIMON, CO
163	MKC-88-H-TR21	08/28/88	5:45 AM	WHITEVILLE, IN
164	NYC-88-H-TR20	08/26/88	2:56 PM	BERNARDS TOWNSHIP, NJ
165	NYC-88-H-TR22	06/11/88	9:15 PM	GRANTSVILLE, MD
166	CHI-88-H-TR25	08/30/88	3:30 AM	MADISON, GA
167	SEA-88-H-TR19	05/27/88	6:10 AM	MERCED, CA
168	LAX-88-H-TR21	06/27/88	12:35 PM	LOS ANGELES, CA
169	SEA-88-H-TR20	07/13/88	1:50 PM	KINGSBURG, CA
170	CHI-88-H-TR26	09/04/88	2:06 AM	STATESVILLE, NC
171	LAX-88-H-TR22	09/06/88	11:27 PM	PALM DESERT, CA
172	MKC-88-H-TR22	09/09/88	2:30 PM	SHALLOTTE, NC
173	FTW-88-H-TR15	09/14/88	2:10 AM	MONROE, NC
174	MKC-88-H-TR23	09/14/88	9:50 PM	GREENSBORO, GA
175	LAX-88-H-TR23	09/14/88	10:50 AM	VALLEY CENTER, CA
176	NYC-88-H-TR23	08/18/88	3:40 PM	BALTIMORE, MD
177	SEA-88-H-TR22	09/27/88	10:59 AM	SOLEDAD, CA
178	DEN-88-H-TR24	09/30/88	6:15 AM	HAMILTON CITY, CA
179	MKC-88-H-TR24	08/08/88	7:48 AM	PLYMOUTH, NC
180	SEA-88-H-TR23	08/31/88	9:30 AM	DAVIS, CA
181	DEN-88-H-TR25	08/31/88	4:40 PM	PEARSON, GA
182	LAX-89-H-TR01	09/14/88	7:15 AM	BELL, CA

★U.S.GOVERNMENT PRINTING OFFICE:1990-261-991:03048

END

DATE

FILMED

5-11-90

NTIS