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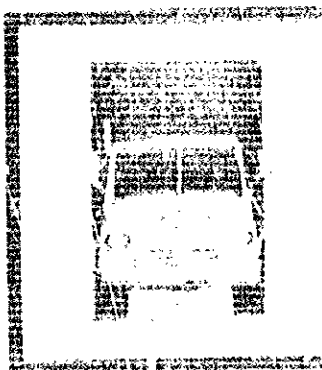
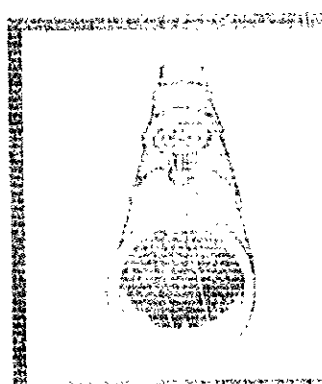
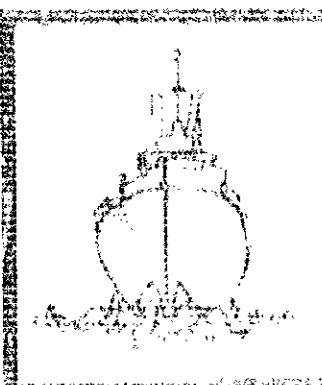
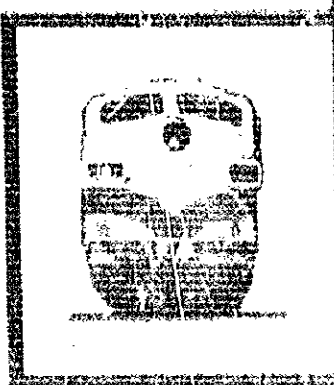
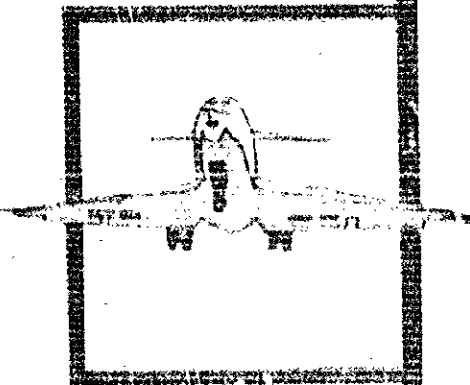
RAILROAD ACCIDENT REPORT

HEAD-ON COLLISION OF
CSX TRANSPORTATION FREIGHT TRAINS
EXTRA 4443 NORTH AND EXTRA 4309 SOUTH
EAST CONCORD, NEW YORK
FEBRUARY 6, 1987

NTSB/RAR-88/03

UNITED STATES GOVERNMENT

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16. Abstract On February 6, 1987, two CSX Transportation freight trains collided head-on at East Concord, New York. Both trains were operating on dispatcher-issued train orders in nonsignaled territory. Two crewmembers were killed, one crewmember was injured seriously, and six crewmembers received minor injuries. Damage was estimated at \$2,009,950. The safety issues examined were transmission of train orders and messages via telecopier to an unstaffed train order office; verification of train orders and messages received by traincrews at an unstaffed train order office; management oversight in the delivery of train orders and in rules compliance; radio communications; and delay in taking toxicological samples.			
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CONTENTS

EXECUTIVE SUMMARY	iii
INVESTIGATION	
The Accident	1
Injuries to Persons	4
Damage	5
Train Information	5
Track Information	7
Personnel Information	7
Traincrews	7
Operator/Clerk	7
Dispatcher	8
Method of Operation	8
Meteorological Information	11
Medical and Pathological Information	11
Survival Aspects	12
Tests and Research	12
Other Information	12
ANALYSIS	
General	13
Train Orders	13
Management Oversight	15
Radio Communications	15
Toxicology Tests	16
Survival Aspects	16
CONCLUSIONS	
Findings	17
Probable Cause	17
RECOMMENDATIONS	18
APPENDIXES	
Appendix A--Investigation	19
Appendix B--Personnel Information	21
Appendix C--Excerpts from CSX Operating Rules	23
Appendix D--Train Order No. 1	25
Appendix E--Train Order No. 2	27
Appendix F--First Clearance Form A	29
Appendix G--Train Order No. 4	31
Appendix H--Second Clearance Form A	33
Appendix I--Superintendent's Bulletin Supplement S-7-A	35
Appendix J--Trainmaster's Bulletin No. 4	37
Appendix K--Administrative Wire Message, July 12, 1985	39
Appendix L--Superintendent's Bulletin Supplement S-7-B	41

EXECUTIVE SUMMARY

On February 6, 1987, two CSX Transportation freight trains collided head-on at East Concord, New York. Both trains were operating on dispatcher-issued train orders in nonsignaled territory. Two crewmembers were killed, one crewmember was injured seriously, and six crewmembers received minor injuries. Damage was estimated at \$2,009,950.

The safety issues discussed in this report include:

1. Transmission of train orders and messages via telecopier to an unstaffed train order office;
2. Verification of train orders and messages received by traincrews at an unstaffed train order office;
3. Management oversight in the delivery of train orders and in rules compliance;
4. Radio communications;
5. Delay in taking toxicological samples.

The National Transportation Safety Board determines that the probable cause of this accident was the failure of CSX management to issue and enforce procedures for traincrews to verify the accuracy of train orders before departing East Salamanca, which permitted the undetected inadvertent transmittal of train orders to the wrong station.

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.**

RAILROAD ACCIDENT REPORT

**HEAD-ON COLLISION
OF CSX TRANSPORTATION FREIGHT TRAINS
EXTRA 4443 NORTH AND EXTRA 4309 SOUTH
EAST CONCORD, NEW YORK
FEBRUARY 6, 1987**

INVESTIGATION

The Accident

At 11:47 p.m., on February 5, 1987, CSX Transportation train Extra 4443 North, consisting of a four-unit, diesel-electric locomotive, 24 loaded and 19 empty freight cars, and a caboose, departed the Larkey Town Road crossing, 2 miles north of Du Bois Yard, Du Bois, Pennsylvania, for Buffalo Creek, New York. (See figure 1.)

At 1 a.m., on February 6, 1987, Extra 4443 North was stopped at Johnsonburg, Pennsylvania, where three cars were uncoupled and placed on a siding. Fifteen minutes later, the train continued northward. At 2:20 a.m., the train dispatcher, located at Punxsutawney, Pennsylvania, aligned the track to permit the train to enter a westward siding at Boyer, Pennsylvania, and allow two southbound trains to pass. Extra 4443 North entered the siding, where it remained until about 5 a.m.

About 4:16 a.m., the dispatcher consecutively issued train orders 1 and 2 to the operator/clerk (hereafter called operator), also located in Punxsutawney. (See appendices D and E.) The train orders were addressed to Extra 4443 North at East Salamanca, New York, and authorized Extra 4443 North to move from Ashford, New York, to Buffalo Creek on the main line track of the Third Subdivision. (See figure 1.) The operator transcribed the train orders, which the dispatcher had dictated, and filled out a Clearance Form A. (See appendix F.) The operator then repeated all the information back to the dispatcher, who responded by saying "OK." The dispatcher recorded the information in the Daily Train Order Book (DTOB). The operator completed the entry by recording the time of completion and his initials on the Clearance Form A.

The operator transmitted train orders 1 and 2 and the Clearance Form A to a telecopier unit at the unstaffed and unsupervised train order office at East Salamanca where the crew of Extra 4443 North would stop to receive the documents. The telecopier log at East Salamanca indicated that documents were received from the telecopier in Punxsutawney between 4:18 a.m. and 4:20 a.m.

At 4:45 a.m., the dispatcher was informed that a train from Conrail was en route to the CSX at Buffalo Creek. He called a crew for the train, which he designated as Extra 4309 South, and ordered the crew to report at Buffalo Creek at 7:15 a.m. The train was to move south on the main line track of the Third Subdivision.

About 4:50 a.m., the dispatcher talked by radio with the crew of Extra 4443 North as they were preparing to leave the siding at Boyer. He requested and received their assistance in clearing the siding's north switch of snow. During that communication, the dispatcher did not mention train

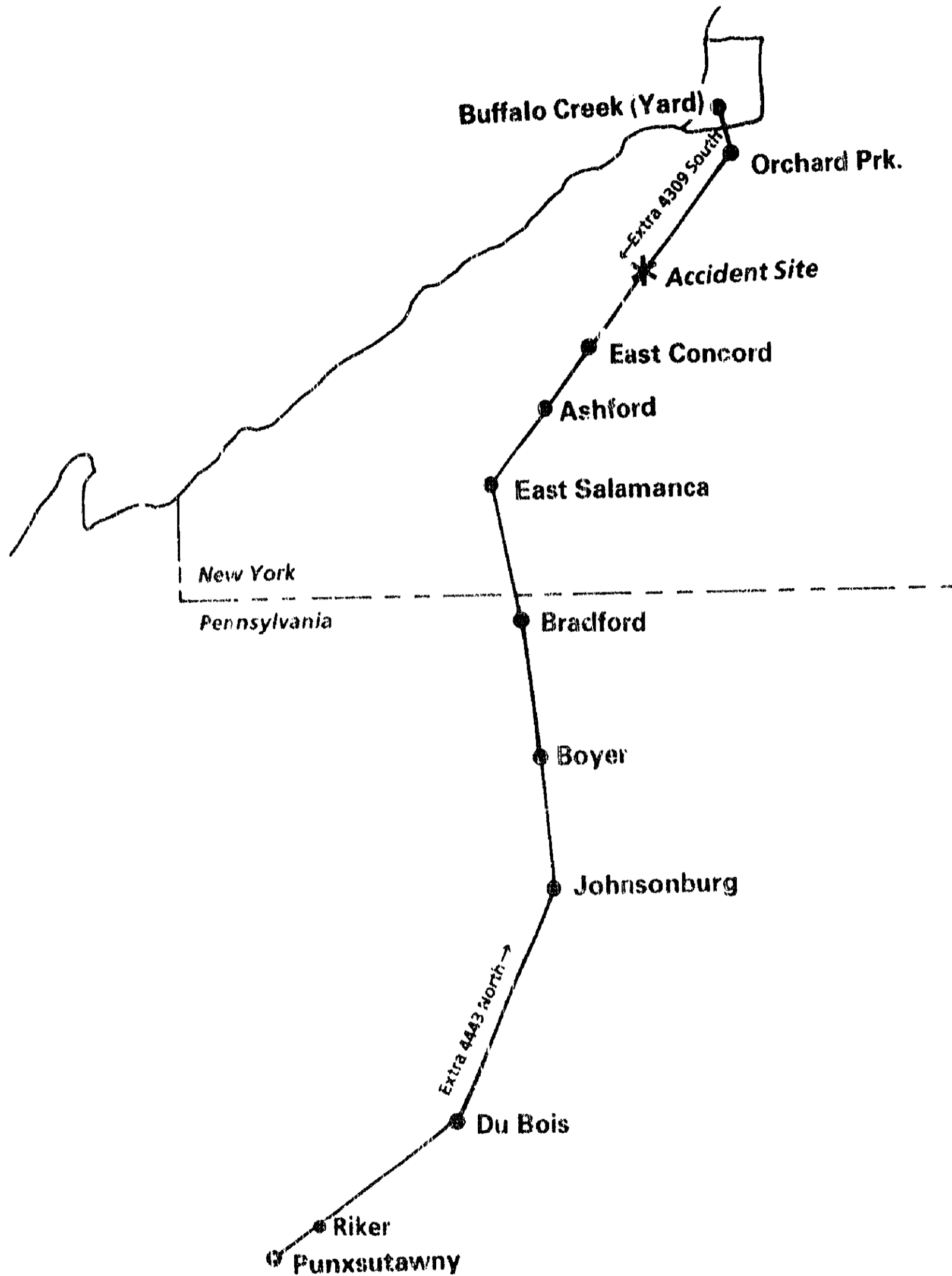


Figure 1.--Buffalo Division station locations.

orders 1 and 2, which the crew would not receive until Extra 4443 North reached East Salamanca, and did not mention Extra 4309 South. Extra 4443 North resumed its northbound trip about 5 a.m.

At 5:06 a.m., the dispatcher issued train order 4 to the operator. (See appendix G.) Train order 4 was addressed to Extra 4443 North at East Salamanca and to Extra 4309 South at Buffalo Creek. Train order 4 instructed Extra 4443 North to take a siding and meet Extra 4309 South at East Concord, New York. (See figure 1.) The dispatcher also issued a second Clearance Form A, which listed train order 4 and train orders 1 and 2 issued earlier to Extra 4443 North. (See appendix H.) The operator repeated the information back to the dispatcher, who voided the copy of the first Clearance Form A in the DTOB. The dispatcher and the operator did not discuss destruction of the first Clearance Form A at the East Salamanca train order office. The operator said that he then transmitted train order 4 and the second Clearance Form A to Extra 4443 North at the train order office at East Salamanca via telecopier about 5:12 a.m. The telecopier log at East Salamanca did not indicate that this transmission was received there. However, the telecopier log at the Du Bois Yard indicated that documents were received from the telecopier in Punxsutawney at 5:12 a.m.

At 6:07 a.m., the dispatcher issued nine train orders, some messages, and a Clearance Form A to the operator. The documents were addressed to Extra 4309 South at Buffalo Creek. Included in the documents was train order 4, which instructed Extra 4443 North to take the siding at East Concord, and train order 6, which authorized Extra 4309 South to occupy the track between Buffalo Creek and Ashford southbound. The telecopier log at Buffalo Creek indicated that documents were received from the telecopier in Punxsutawney at 6:18 a.m.

At 6:25 a.m., Extra 4443 North arrived at East Salamanca, after stopping at Bradford, Pennsylvania, to set off 13 cars. The engineer, front brakeman, conductor, and fireman went into the train order office, and the rear brakeman remained on the caboose. An agent/operator, who was scheduled to go on duty at East Salamanca at 7 a.m., was in the building, but he had not noted or handled any documents from the telecopier. According to the conductor and fireman, the conductor removed from the telecopier two copies of train orders 1 and 2 and the Clearance Form A, which authorized Extra 4443 North to occupy the track between Ashford and Buffalo Creek northbound. The four crewmembers discussed the train orders and left the office together. According to the conductor and fireman, neither train order 4, instructing Extra 4443 North to take the siding at East Concord, nor the Clearance Form A listing train orders 1, 2, and 4 were among the documents received or discussed. The fireman stated that it was neither a practice nor a requirement for a crew to contact the operator or the dispatcher at Punxsutawney about the contents of clearance forms received at East Salamanca.

At East Salamanca, nine cars were set off and five cars added to Extra 4443 North. About 7:20 a.m., while the crew was performing the required airbrake test on the additional cars, the dispatcher contacted the conductor by radio and asked if the train was ready to depart. The conductor said that when he talked to the dispatcher, there was no mention of train order 4. Extra 4443 North departed East Salamanca at 7:25 a.m. with the engineer at the controls and the front brakeman in the lead unit. The conductor was in the second unit, and the rear brakeman was in the caboose. The fireman left the train in East Salamanca.

At 7:55 a.m., Extra 4309 South, consisting of a two-unit locomotive and 10 container cars, departed Buffalo Creek. The fireman, who was a qualified locomotive engineer, was seated at the controls, the engineer was in the middle seat, and the rear brakeman was seated on the left (east) side of the lead unit. The conductor and head brakeman were located in the second unit.

The conductor and engineer of Extra 4309 South had received the Clearance Form A listing the nine train orders issued by the dispatcher at 6:07 a.m., including train order 6, which authorized Extra 4309 South to occupy the main line track between Buffalo Creek and Ashford southbound.

The crew said they did not contact either the operator or dispatcher at Punxsutawney to verify the train orders.

The dispatcher stated that the dispatcher-controlled signal at Ashford governing entrance to the single main line track was displaying a clear signal, which was favorable for the northbound movement of Extra 4443 North. The train continued past the siding in East Concord and, about 2 1/2 miles north of East Concord, Extra 4443 North, while traveling at 32 mph, collided head-on with Extra 4309 South at 8:47 a.m.

Approaching the accident site from the north, the track curved 3°08' to the right, and then 5°06' to the left. The crewmembers on the lead unit of Extra 4309 South said that as their train rounded the curve to the right, Extra 4443 North came into view, with headlight illuminated. The sight distance was restricted due to a side hill cut located east of the track. The fireman on Extra 4309 South said his train was traveling at 30 mph.

The locomotive units from both trains derailed, as did eight freight cars from Extra 4443 North and three cars from Extra 4309 South. Locomotive fuel tanks were breached during the collision, but the spilled fuel did not ignite. After Extra 4309 South came to rest, the fireman assisted the engineer and the rear brakeman through the rear cab door of the lead unit. The engineer assisted the fireman in getting the rear brakeman down the ladder. While walking toward the front of the locomotive, the engineer of Extra 4309 South found the fatally injured engineer of Extra 4443 North on the west side of the track under the cab of the train's inverted lead unit and the injured front brakeman of Extra 4443 North in the cab of the lead unit. According to the engineer and fireman of Extra 4309 South, the brakeman of Extra 4443 North told them that his train did not have a train order that instructed it to take the siding at East Concord. He died before arriving at a hospital. Rescue personnel found the seriously injured conductor of Extra 4443 North in the second locomotive unit.

Train orders 1 and 2 and the first Clearance Form A were found in the possession of the front brakeman of Extra 4443 North. Train order 4 and the second Clearance Form A, both addressed to Extra 4443 North, were found at the Du Bois Yard. A brakeman going off duty at Du Bois had observed train order 4 at Du Bois about 6:55 a.m. He said that he thought finding train order 4 and the Clearance Form A at Du Bois was strange, but he did not inquire into the matter further. He stacked the train order, along with about 15 other sheets of paper at the end of the telecopier and left the train order office. At 7 a.m., another brakeman going on duty found train order 4. He noted that it was addressed to a train at East Salamanca and discarded it. Both brakemen stated that they did not notify the dispatcher or CSX supervisors. (Rule F(3) of the Chessie System Operating Rules required that unusual conditions be reported to a division officer by the quickest available means of communications.) After hearing of the accident, the second brakeman informed another crew going on duty in Du Bois of the discarded train order. The crew retrieved the order and delivered it to a trainmaster in East Salamanca about 9 p.m.

Injuries to Persons

	Extra 4443 North	Extra 4309 South	Total
Fatal	2	0	2
Nonfatal	2	5	7
None	0	0	0
Total	4 1/2	5	9

1/ The fireman was not on board at the time of the accident.

Damage

The two lead locomotive units of Extra 4443 North were destroyed. The car body of the lead locomotive unit was sheared off at the platform level. It overturned toward the west, and the operating compartment was crushed. The second unit overturned and came to rest parallel to the lead unit. The third and fourth units were both derailed, but remained upright. Of the eight cars derailed, six were substantially damaged, and two sustained minor damage. (See figure 2.)

The lead locomotive unit of Extra 4309 South was destroyed, and the second unit was substantially damaged. Three freight cars derailed. (See figure 2.)

CSX estimated damage costs to be as follows:

Damage	Cost
Equipment (locomotives)	\$1,362,000
Equipment (cars)	481,450
Track	6,500
Wreckage clearance	<u>160,000</u>
Total	\$2,009,950

Train Information

The locomotive of Extra 4443 North consisted of four diesel-electric units. The first two units were model GP-40-2, 3,000-horsepower, four-axle units. The third and fourth units were model SD 26 (remanufactured SD-24 models), 2,400-hp, six-axle units. All units were manufactured by the Electro-Motive Division of the General Motors Corporation. The units were equipped with 26-L airbrake systems, dynamic brakes, and speed indicators. The lead unit was equipped with an operable radio. The fourth unit was equipped with an operative mechanical speed recorder. The total locomotive weight was about 1,340,000 pounds. At the time of the accident, the train contained 2 loaded freight cars, 21 empty freight cars, and a caboose, for a trailing tonnage of 860 tons and a total length of 1,640 feet. The caboose was not equipped with an operable radio, but the rear brakeman was carrying an operable portable radio.

The locomotive of Extra 4309 South consisted of two diesel electric units, both model G1-40-2, 3,000-hp, four-axle, 510,000-pound units manufactured by the Electro-Motive Division of the General Motors Corporation. The lead unit was not equipped with an operable radio, but the engineer used a portable radio, which had been issued at Buffalo Creek. The units were equipped with 26-L airbrake systems and dynamic brakes. The lead unit was equipped with an operable mechanical speed indicator/recorder. The fourth unit was equipped with a speed indicator. At the time of the accident, the train contained 10 cars, each consisting of 5 articulated units, each unit carrying two double-stacked containers. The train had a trailing tonnage of 1,141 tons and a total length of about 2,568 feet. The train operated without a caboose and employed an end-of-train telemetry device, which was operating as intended.



Figure 2 --Eastward view of accident site showing Extra 4309 South (left) and Extra 4443 North (right)

Track Information

At the accident site, the single main track was constructed of 100-pound RE continuously welded rail (CWR). The rails were laid on single-shouldered tie plates atop 7-inch by 9-inch by 8-foot 6-inch treated hardwood crossies. Approaching the accident site from the south, the track proceeded through a 1,090-foot, 5°6' curve to the right, through a tangent for about 380 feet, and through a 400-foot, 3°8' curve to the left. The track profile is 1.25 percent descending northward.

The track met the minimum standards of the Federal Railroad Administration (FRA) track safety standards for class 3 track, which permitted a maximum speed of 40 mph for freight trains. On the east side of the track structure, trees and foliage were within about 20 to 30 feet of the track. On the west side of the track structure, scattered trees and shrubs were within 20 feet of the track. A creek paralleled the track on the west side. A side hill cut about 50 yards southeast of the point of collision limited visibility. During the postaccident repair of the damaged track, the alignment was altered to a more tangent configuration.

Personnel Information

Traincrews—All crewmembers on both Extra 4443 North and Extra 4309 South were qualified by CSX standards for their respective positions; all were current on the Chessie operating rules. (See appendix B.)

The fireman of Extra 4443 North did not ride the train with the rest of the crew when the train departed East Salamanca. Instead, he picked up his automobile and then drove from East Salamanca to Buffalo Creek, planning to pick up the train's engineer. It was customary for the two men to return to East Salamanca, where they both lived, in the fireman's automobile.

After the accident, the fireman and the conductor of Extra 4443 North said they believed that a member of the crew could leave the train to transport other crewmembers and that this practice was tacitly approved by supervisors. However, the conductor said he was unaware that the fireman had left the train at East Salamanca. The rear brakeman also stated that he thought the fireman had remained with the train.

The second paragraph of Rule P of the Chessie System Operating Rules states: "No employee will absent himself from duty, nor engage a substitute to perform his duties without permission from the immediate supervisor." There was no supervisor on duty at East Salamanca, and the conductor did not give the fireman permission to leave the train.

Operator/Clerk—The operator at Punxsutawney had been employed by CSX and its predecessors for about 38 years. (See appendix B.) He was qualified for his position and was current on the Chessie System Operating Rules. He worked the "Extra Board," a list from which employees are called to cover vacancies, and was called when he was needed to perform service as an operator. Due to being assigned to the "Extra Board," he often had to rotate among the first (7 a.m. to 3:30 p.m.), second (3 p.m. to 11:30 p.m.) and third (11 p.m. to 7 a.m.) shifts. In addition to train order duties, the CSX operators at Punxsutawney are required to perform clerical, wire chief, and crew caller duties. The operator said he ran the computer, recorded train times, copied train orders, and transmitted data via the telecopier to three train order offices. He said he had the phone numbers for the three offices memorized and mentally checked them before dialing. ¹⁷ He also received and compiled information about crew activities for pay purposes. The operator described his workload on the morning of February 6 as "really busy," between 4 a.m. and 6 a.m. He answered phone calls from various foremen inquiring about track availability. He said he handled as many as six trains

¹⁷ The phone numbers were DuBois yard, 814-375-1131, East Salamanca, 716-945-1085, and Buffalo Creek, 716-826-0665.

during the shift. He said that, since the East Salamanca train order office became an unstaffed office on July 12, 1985, his workload for the second and third shifts had doubled. He said that while he handled about the same number of trains, he copied many more train orders.

Dispatcher.--The dispatcher controlling train movements between Du Bois Yard and Buffalo Creek had been employed by the CSX and its predecessors for about 37 years. He had held positions as student operator, operator, clerk train dispatcher, and chief train dispatcher. (See appendix B.) The dispatcher worked a combined job, that of chief train dispatcher and train dispatcher, and was responsible for setting on-duty times for trains and for issuing train orders to the operators. In describing his job, he said, "I am in charge of whatever goes on, on the railroad . . . I have one operator and we run the whole Buffalo Division." He said he was "always busy," and "You do a little here and a little there and the telephone interrupts you. . . . You just literally go in there and go nuts for eight hours." He said he was "lucky" if he could take two trips to the restroom on any given shift.

The dispatcher told investigators that he had "some fleeting thoughts several times to talk to the Extra 4443 North crew just to be sure they had received train order 4," but that he "was absolutely prevented from doing so due to his workload." He said he could have stopped Extra 4443 North:

if I would have known it, but I was continually without let up, busy, never a moment's let up between telephone calls, radio communications with other trains and a train at Johnsonburg having some problems . . . I never ever got back to that 4443, I never got a chance to listen to them or talk to them.

Method of Operation

CSX Transportation was formed in 1980 from a merger of nine separate railroads. The portion of the railroad on which this accident occurred was formerly the Chessie System, and Chessie System Operating Rules were in effect at the time of the accident. The track between Du Bois and East Salamanca was designated as the Second Subdivision, and the track between East Salamanca and Buffalo Creek was designated as the Third Subdivision. (See figure 1.) The subdivisions were part of the Pennsylvania Division, headquartered at Pittsburgh, Pennsylvania.

The Chessie System, Pennsylvania Division Timetable No. 4, stipulated the maximum authorized speed for the main line track of the Third Subdivision as 40 mph. The maximum permitted speed between Ashford and Buffalo Creek was 30 mph due to a permanent timetable speed restriction. Traincrews that operated over this territory originated at the CSX terminal facility in Buffalo Creek and laid over as necessary in Du Bois. The line between Buffalo Creek and Du Bois in both directions was controlled by the dispatcher in Punxsutawney.

From 1912 to 1962, train movements on the Main Line Third Subdivision were controlled by timetable schedules and train order authority. An Automatic Block Signal (ABS) system was installed to provide protective separation of trains. In ABS territory, automatic signals convey the condition (occupied or unoccupied) of blocks (portions of track of defined limits). The signals also convey permission for trains to proceed or to stop and stay. The signals operate automatically as trains pass from one block to another. The dispatcher also can control some of the signals.

On February 26, 1962, Chessie requested permission from the Interstate Commerce Commission (ICC) to discontinue the ABS system between Ashford and Buffalo Creek. In its request Chessie stated, "No change is proposed in the open stations or the manner in which track motor cars will be protected." At the time of the request, 14 northbound and 14 southbound freight trains operated each week between Ashford and Buffalo Creek. Passenger train service had been discontinued in 1955. (At the time of this accident an average of nine northbound and nine

southbound freight trains operated each week between Ashford and Buffalo Creek.) On July 19, 1962, the ICC approved the removal of the ABS system between Ashford and Buffalo Creek.

In 1962, trains began operating between Ashford and Buffalo Creek on non-signalized, single-track territory by train orders and were governed by operating rules, timetables, and special instructions. Train order operation under Chessie System Operating Rules include the following actions: The dispatcher issues train orders to the operator, who transcribes the orders onto a train order form and verbally repeats the instructions back to the dispatcher. The operator then completes a Clearance Form A, which notes the total number of train orders, any messages, the latest Superintendent's Bulletin Supplement, and the numbers of the train orders for delivery to the correct train. The operator also repeats the contents of Clearance Form A to the dispatcher, who records it in the daily train order book (DFOB). If the information on the Clearance Form A is correct, the dispatcher confirms its accuracy by saying "OK." The operator then notes the time and the initials of the dispatcher on the Clearance Form A. Finally, the operator issues the train orders and Clearance Form A to the traincrew by phone, radio, hand-delivery, or telecopier. A traincrew cannot act on train orders until they also receive a Clearance Form A from the dispatcher. Once a traincrew receives a properly executed Clearance Form A and has the listed train orders, their train has the authority to occupy the track within the limits stated in the orders. If it becomes necessary to issue a second Clearance Form A after the first Clearance Form A has been approved by the dispatcher, the Chessie System Operating Rules require that all copies of the first Clearance Form A must be destroyed. The only exception is the operator's copy, which must be marked "void" and kept on file in the DFOB.

For some time before July 12, 1985, train orders and Clearance Form As were issued by the dispatcher to the operators on duty at train order offices at Du Bois, Riker, and East Salamanca. (See figure 1.) The orders were communicated directly via speaker or telephone to these operators who repeated them back to the dispatcher. The dispatcher approved them, and the operator delivered them to the traincrew. If a dispatcher issued the train order to the wrong location, the operator would inform the dispatcher of an error in the train order address.

On July 12, 1985, Superintendent's Bulletin Supplement S-7-A closed the East Salamanca train order office and abolished the operator position there. (See appendix I.) Train orders, messages, Clearance Form As, and other documents were thereafter to be transmitted by a telecopier, which had been previously installed at the office. Trainmaster's Bulletin No. 4 (see appendix J), dated July 12, 1985, and addressed to all East Salamanca-area employees, explained how to gain entry to the locked building. The bulletin also instructed train conductors to call the operator at the Riker train order office 2 miles north of Punxsutawney to verify orders and messages received from the telecopier at East Salamanca. The Riker operator was then to complete the Clearance Form A and transmit it on the telecopier to East Salamanca. Also on July 12, 1985, an administrative wire message sent by a freight agent explained how to deliver train orders and messages to crews originating at East Salamanca via the operator at Riker. (See appendix K.)

On July 16, 1985, Superintendent's Bulletin Supplement S-7-B was issued reestablishing a staffed train order office at East Salamanca from 7 a.m. to 3 p.m., Monday through Friday. (See appendix L.) On May 14, 1986, Superintendent's Bulletin Supplement S-5-C was issued, closing the Riker train order office. The Safety Board investigation did not reveal any instructions issued by CSX management explaining how traincrews were to verify train orders received at East Salamanca after the Riker train order office closed. On September 3, 1986, a letter addressed to "All crews at Du Bois" instructed crews going on duty at Du Bois to verify the train orders taken from the telecopier machine at Du Bois. Crews at East Salamanca were not mentioned. This letter was signed by the road foreman of engines and the trainmaster, who supervised the crews at East Salamanca and Du Bois. Rule A-1 of the Chessie System Operating Rules states: "Rules will be added, changed or canceled only by special instructions or train order."

The use of duplicating machines for the reproduction or transmission of train orders is addressed in the "Exception" to Rule 209A in the CSX Rules for Movement by Train Order. (See appendix C.) Telecopiers are considered by the CSX as duplicating machines. The operator involved in the East Concord accident said the "telecopiers are wonderful instruments," but "they do not tell you if the orders arrive." He also said that traincrews did not call from the East Salamanca train order office to verify train orders because "their instructions are to go in and pick up their orders." The dispatcher said that he did not operate the telecopier machines, and therefore would not know if an operator sent the orders to the wrong office. There was no indication that the dispatcher ever brought this lack of oversight to the attention of CSX management.

The dispatcher and operator in Punxsutawney were in separate but adjacent offices. The operator could not communicate by radio with traincrews and was not required to. The dispatcher could communicate with traincrews by radio from his office. Neither the dispatcher's nor the operator's position is considered supervisory, and no supervisor is assigned to the Punxsutawney office between 11 p.m. and 7 a.m.

The dispatcher and the operator said that from the time the train order offices at East Salamanca, Riker, and Du Bois were closed, there had been no procedures for traincrews to follow to confirm the accuracy and currency of train orders before departing a given location. The dispatcher said that with the replacement of operators by telecopiers, there was no way to destroy transmissions that had already been made. The investigation did not disclose any CSX instructions for annulling and reissuing Clearance Form As.

The train dispatcher told Safety Board Investigators:

There is no way to destroy any transmission that is already up there [East Salamanca]. It's laying there on the table near the machine. There is nothing we can do about it. The only thing we can do is send a second Form A, with a later time, maybe showing with an additional order or maybe a message would take precedence over an earlier one. The later one with the later time is the one they would keep.

An assistant superintendent told Safety Board investigators that he was responsible for initiating the practice of issuing the Clearance Form A prior to a traincrew verifying that they had received train orders. However, in a later statement to investigators, he said, "But not before the crew called the operator and read the orders back to him."

Between January 1986 and January 1987, CSX management made six efficiency test observations related to the movement of trains by train orders. These observations were office tests made on the legibility of train orders. No observations were made regarding receipt or delivery of train orders, or the destruction of a Clearance Form A after the issuance of a second Clearance Form A countermanding the first.

A trainmaster headquartered at Buffalo and a road foreman of engines headquartered at Punxsutawney were first-line supervisors of train operations at East Salamanca. The trainmaster typically worked daylight hours. He reported for work about 7 a.m. on the day of the accident; the road foreman reported for duty at 6:50 a.m. When not on the property, both the trainmaster and the road foreman were subject to 24-hour call. In addition, they were expected to make periodic surprise efficiency tests at night. At the time of the accident there was no set number of trains that they were required to ride. When performing efficiency tests, they generally did so independently. On occasion, they were accompanied by one or more supervisors, including the assistant superintendent. The assistant superintendent and superintendent were CSX management employees.

The division manager, who was headquartered in Pittsburgh, had been in that position for 1 year. During his tenure as division manager, he conducted three seminars, in Pittsburgh, Punxsutawney, and Grafton, West Virginia. He said that at the seminars he requested attendees to suggest improvements that might improve and/or eliminate unsafe conditions. Although many suggestions were made, he said, none related to train order operations. He further stated that no complaints had been received from the operating unions or their members regarding unsafe train order operation. The division manager said that he was not aware that the completed Clearance Form As were being transmitted before a traincrew verified that they had received train orders.

On February 8, 1987, 2 days after the East Concord accident, the dispatcher at Punxsutawney issued train order 800 addressed to the "Conductors and Engineers of All Trains" via the operator at Punxsutawney. The train order was as follows:

AFTER RECEIVING YOUR TRAIN ORDERS AND MESSAGES FROM THE TELECOPIER THE CONDUCTOR OR ENGINEER WILL CALL NX (PUNXSUTAWNEY) OPERATOR AT 220, 219 OR 1 814 938 2557. THE OPERATOR WILL THEN COMPLETE THE FORM A AND TRANSMIT SAME ON THE TELECOPIER TO THE TRAIN.
C.C.I.
MADE COMPLETE 5:51 P.M.

On March 1, 1987, Timetable No. 1 was placed in effect, changing the method of operation in the area of the collision to that of Direct Traffic Control Block System Rules. This method of operation requires a qualified and designated employee located at a control station to give verbal permission to a train to enter a block. When the conductor, engineer, or any crewmember under the direct supervision of the conductor or engineer receives authority for the train to enter a block, that person is to repeat the authorization back to the control station employee. This employee records the verification (with initials, time, and date) on a Direct Traffic Control Form.

CSX also placed a new rulebook in effect on March 1, 1987. The rules require that when train orders or instructions are received at an unstaffed train order office, the conductor or engineer of the train addressed must contact the operator or dispatcher and confirm such orders and instructions with the dispatcher before proceeding.

Meteorological Information

At the time of the accident, it was daylight, the weather was clear, and the ambient temperature was 16° F. There was 24 inches of snow on the ground with drifts up to 48 inches.

Medical and Pathological Information

The engineer of Extra 4443 North died as a result of injuries received during the collision. The front brakeman of train Extra 4443 North was seriously injured and suffered a fatal heart attack while en route to the hospital. The engineer and front brakeman were both current in their CSX-required medical examinations. Neither man was known to have any medical problems.

The front brakeman of Extra 4309 was hospitalized for possible back injury and broken ribs. The remaining crewmembers were all treated for minor injuries and released.

Toxicological analyses of urine samples obtained from the dispatcher on duty at the time of the accident and from the dispatcher and operator on duty when train orders 1, 2, 4, and 6 were issued and transmitted were negative for alcohol and drugs. The samples were taken about 7 hours after the accident. Blood and urine samples were obtained from the engineer of Extra 4443 North 4 hours after the accident. The results were negative for alcohol and drugs. The remaining crewmembers of both trains also had negative results for alcohol and drugs.

Survival Aspects

The engineer and the front brakeman of Extra 4443 North were in the forward unit of the locomotive at the time of the accident. The lead unit of Extra 4309 South climbed over the front of the lead unit of Extra 4443 North, tearing the operating compartment from the frame. The operating compartment was thrown to the west of the track, and the fatally injured engineer was found under the inverted cab. The front brakeman was found in the remains of the cab. The injured conductor was found in the cab of the second unit. The operating compartment of the lead unit of Extra 4309 South remained relatively intact.

The Kissing Bridge Ski Patrol and local residents notified emergency response personnel of the accident. The Erie County Sheriff's Department, Erie County Emergency Services, East Concord Volunteer Fire Department, Colden Fire Company, and La Salle Ambulance Company's Mercy Flight Helicopter quickly responded to the scene. Snowdrifts hindered the rescue effort.

Tests and Research

A postaccident inspection of the train's locomotives was not possible because of the severity of the collision and subsequent derailment. However, testing of the undamaged cars on both trains indicated that the automatic airbrake equipment functioned as intended, with no noted defects.

The tapes removed from the speed recorders of Extra 4443 North and Extra 4309 South indicated speeds of 32 mph and 30 mph, respectively, at the time of collision.

Other Information

The Safety Board examined the results of efficiency tests performed between January 1986 and January 1987 by CSX management on the main line track of the Second and Third Subdivisions. The findings were as follows:

Number of officers participating	6
Total rule tests made	2,865
Surprise tests performed	1,828
Casual observations	1,037
Failures noted	320

Of the 2,865 rule tests performed, 367 were conducted on the third shift (11 p.m. - 7 p.m.). None of the 218 tests conducted at East Salamanca were on the proper receipt of train orders.

The rules observed were as follows:

Radio Procedures	876
Use of Handbrakes and Switches	873
Safety	340
Miscellaneous	396
Use of Drugs or Alcohol	167
Train Handling	96
Use of Marker Devices	58
Observation of Trains by Crew	41
Fixed Signals	9
Movements by Train Order	6
Speed Rules	0
Rule 34 (Crew Communication of Signals)	0

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According to the CSX, ^{2/} its efficiency test objectives are as follows:

1. To eliminate human failure accidents.
2. To improve employee compliance with the operating rules.
3. To determine the degree of compliance or failure to comply with the operating rules.
4. To determine on what rules and in what areas concentration is needed to improve employees' knowledge of the operating rules and special instructions.

ANALYSIS

General

The operating crews of both trains were qualified, no defects were found in the remaining equipment or track, the weather was not unusual, and the limited sight distance only contributed to the severity of the collision. There is no evidence that the health of the traincrews, operator, or dispatcher was a factor in the accident. Drugs or alcohol were found not to be involved. Therefore, the Safety Board concludes that none of these factors contributed to the cause of this accident.

Train Orders

The dispatcher issued train orders 1 and 2 and a Clearance Form A addressed to Extra 4443 North at 4:16 a.m., and the documents were received at the East Salamanca train order office at 4:18 a.m. The dispatcher issued train order 4 and another Clearance Form A addressed to Extra 4443 North at 5:06 a.m., but these documents were never received at East Salamanca. When the crew of Extra 4443 North arrived at East Salamanca at 6:25 a.m., the only train orders they found were train orders 1 and 2 and a Clearance Form A that authorized Extra 4443 North to occupy the main track from Ashford to Buffalo Creek northbound. They did not receive train order 4 and the second Clearance Form A that instructed Extra 4443 North to take a siding at East Concord so that Extra 4309 South could pass on the main track southbound. The evidence shows that the operator mistakenly sent train order 4 and the second Clearance Form A to the Du Bois train order office.

The dispatcher issued train order 6 and a Clearance Form A addressed to Extra 4309 South at 6:07 a.m., and the documents were received at Buffalo Creek at 6:18 a.m. Included with the documents were copies of train orders 1, 2, and 4 to Extra 4443 North. These documents authorized Extra 4309 South to occupy the main track from Buffalo Creek to Ashford southbound. The crew of Extra 4309 South, who had no reason to believe that the crew of Extra 4443 North had not received train order 4, was expecting to pass Extra 4443 North on the siding at East Concord.

The dispatcher and operator at Punxsutawney were required by the Chessie System Operating Rules to ensure the destruction of the first Clearance Form A sent by telecopier to East Salamanca at 4:18 a.m. before they issued and transmitted the second Clearance Form A at 5:06 a.m. Their failure to do so set the stage for a conflict between the two trains. However, the CSX did not have procedures by which the dispatcher and operator could ensure the destruction of documents sent by telecopier to unstaffed train order offices. The CSX also did not require traincrews who received train orders and Clearance Form As at all unstaffed train order offices to verify their accuracy with

^{2/} "Chessie System Railroad, Efficiency Test, Form CDT-66," effective January 1, 1984, updated September 1, 1985.

the dispatcher. Compounding the problem was the practice, which CSX management did not prohibit, of sending Clearance Form As at the same time as the train orders.

When the East Salamanca train order office was closed on July 12, 1985, train conductors who received train orders by telecopier at East Salamanca were required to verify these orders through the operator at the Riker train order office. The Riker operator then completed a Clearance Form A and transmitted it by telecopier to East Salamanca while the conductor was in the train order office. On May 14, 1986, when the train order office at Riker was also closed, the CSX did not issue any specific instructions to traincrews about new procedures to follow to verify train orders received at East Salamanca.

The dispatcher, unlike the operator, could communicate with traincrews by radio. Although the dispatcher stated that he had thought about talking to the crew of Extra 4443 North to be sure they had received their updated orders but that he "was absolutely prevented from doing so due to his workload," the facts do not support that his workload did not allow him time to communicate with the train. The dispatcher twice talked to the crew of Extra 4443 North by radio, once after learning of the approaching Conrail train that would become Extra 4309 South, and again just before Extra 4443 North departed East Salamanca. At either time he could have informed the crew of Extra 4443 North of his intention to put their train in the siding at East Concord to meet Extra 4309 South. He also could have communicated with Extra 4443 North by changing the signal to stop at Ashford before the train entered the single main track. Therefore, the Safety Board concludes that the dispatcher's workload was not a factor in the accident.

CSX management was responsible for providing a procedure for destroying a clearance form A that had been superseded by another clearance form A. The dispatcher was responsible for reporting to his supervisors any unusual conditions that impeded the safe operation of trains, such as the lack of a procedure for destroying clearance form As, when necessary, at unstaffed train order offices. There was no evidence that the dispatcher had informed anyone about the practice of issuing a second clearance form A to an unstaffed train order office even though there was no procedure to destroy the preceding clearance form A. Without destruction and verification of destruction, there was no safety redundancy.

The operator said he handled six trains during his shift. This number of trains is not considered a heavy workload in an 8-hour shift. The operator's error in sending the train order and Clearance Form A to the wrong train order office is referred to in the literature ^{3/} as a "capture error" or "slip." Essentially, this kind of error can occur almost automatically because there is already a strong tendency to perform an action (e.g., sending train orders is both a routine and necessary function of an operator's job) and because circumstances for the action are almost identical to circumstances for another closely related action (e.g., sending train orders to East Salamanca required the operator to perform the same sequence of actions as sending train orders to Du Bois except for the phone number that is dialed on the telecopier). The operator stated that on any given shift he sent an average of three train orders (e.g., two train orders and a Clearance Form A or six train orders and three Clearance Form As) to East Salamanca and twice that amount to Du Bois. There was a significant difference between the phone number of the East Salamanca train order office and the phone number of the Du Bois train order office, however.

One technique for preventing such errors is to provide a "checks and balance" type of feedback mechanism, that for example, would require an operator to verify the destination for a set of orders against its corresponding telecopier number before sending. Another more effective technique (which CSX has instituted since the accident) would require a traincrew to call the

^{3/} Wickens, Christopher D (1984) *Engineering Psychology and Human Performance*. Columbus, Ohio. Charles E. Merrill Publishing Company

dispatcher or operator to confirm their train orders before receiving the Clearance Form A they need to depart a train order office.

Management Oversight

The job performance of both the operator and dispatcher was influenced by the absence of management-imposed safety-critical redundancies in train order operations. Before the CSX closed the train order offices at East Salamanca, Riker, and Du Bois, managers should have thoroughly reviewed and discussed the effect the closings would have on train operations. In the absence of official instructions, the traincrews, dispatchers, and operators were left to use their own judgment in train operations. The employees apparently did not realize the risks involved in operating in this manner. CSX management was responsible for creating a safe operating environment for its employees. The accident resulted from a failure of management to issue and enforce procedures for traincrews to verify the accuracy of train orders before departing East Salamanca. The CSX should evaluate its procedures for the use of train orders being transmitted by telecopier in nonsignaled territory to determine that safe operating practices are not being compromised. The Safety Board is also concerned that other railroads may not have considered all the consequences of traincrews using train orders that are transmitted by telecopier in nonsignaled territories and concludes that the FRA should evaluate such use to determine that safe operating practices are not being compromised.

Although the CSX has acted since this accident to change its method of operation in the accident area, the factors that led to this accident existed for 9 months without being detected by CSX management. Title 49 CFR 217.9 requires railroads to perform efficiency checks of its method of operations. If the CSX had performed efficiency tests regarding the receipt of train orders by telecopier, the tests likely would have revealed (1) the lack of procedures for verifying train orders, (2) the practice of transmitting Clearance Form As at the same time as the train orders, and (3) the absence of specific procedures for the destruction, when necessary and required by the operating rules, of Clearance Form As at unstaffed train order offices.

A review of the efficiency tests made on the Second and Third Subdivisions revealed that train order operation was not examined. It is also apparent that the rules that were tested had little to do with the over-the-road operations of freight trains. Only nine fixed signals were examined and no speed rule checks were recorded. Of the 2,865 tests performed, only 367 were conducted on the third shift. None of the 218 tests conducted at East Salamanca were on the proper receipt of train orders. The CSX should revise its methods for conducting efficiency checks to place appropriate emphasis on critical safety activities.

CSX management's lack of oversight in train operations was also apparent in two other instances related to this accident. When the fireman left Extra 4443 North in East Salamanca, he violated Rule P. The fireman and the conductor of Extra 4443 North both stated that they believed that a member of the crew leaving the train at East Salamanca for the purpose of providing transportation for crewmembers was tacitly approved and that it was a common practice. CSX management should have been aware of this practice. Also, when the brakeman in Du Bois did not report the "unusual conditions" of finding a train order addressed to the wrong location, he violated Rule F(3). CSX management should review its methods for strictly enforcing full and uniform compliance with all company operating rules and for discovering violations of its rules by employees. Oversight by a system or division rules examiner would have identified the absence of safety redundancies.

Radio Communications

Since the dispatcher was aware that verification of the receipt of train orders had been abandoned and that there was no procedure in place for destroying a Clearance Form A that had

already been transmitted, as an added precaution he could have radioed the crew to determine that they had received the proper train orders.

The Safety Board has long been interested in the application of radio use to railroad operations. Safety Recommendations have been issued to the FRA addressing the need for radios to be required equipment on trains, the need for compatibility of radios between railroad properties, and the need for standards governing the use of radios in the railroad industry. Recommendations also have been issued to the individual railroad companies on the same issues. As a result of its investigation of a passenger train accident near Essex Junction, Vermont, on July 7, 1984, ^{4/} the Safety Board issued a recommendation to the FRA on January 15, 1986:

R-85-129

Establish regulations that address the issues surrounding the use of radios for operational purposes on trains to include, but not be limited to, requirements for inter- and intra-train communications; usage requirements for dispatching and control operations; frequency compatibility requirements; and maintenance, inspection, and testing requirements.

The FRA initiated a special safety inquiry on radio communications in 1987, and the Safety Board provided testimony. The Safety Board is unaware of any further regulatory action by the FRA since this inquiry. This accident again illustrates the need for the FRA to move swiftly in its efforts to address the use of radios and radio communication standards to improve operational safety in the railroad industry. The Safety Board reiterates Safety Recommendation R-85-129, which is currently in an "Open--Unacceptable Action" status.

Toxicology Tests

The toxicology samples from the dispatcher and operator involved in this accident were not taken until 7 hours after the accident. The results were negative for alcohol and drugs. There was no evidence that alcohol or drugs were a factor in this accident. However, the Board is concerned with the lack of timely testing of the railroad employees. Because alcohol and drugs are metabolized at different rates by different persons, the usefulness of the tests in determining the employee's physical condition at the time of the accident is strongly dependent on the timeliness of testing.

Survival Aspects

The rescue personnel were timely, efficient, and well-organized in their response efforts, despite initial difficulties encountered with a recent heavy snowfall. Because of the severity of the crash forces incurred by the lead locomotive unit of Extra 4443 North, survivability in that unit was not likely, due to the cab deformation.

^{4/} Railroad Accident Report--"Derailment of Amtrak Passenger Train No. 60, The Montrealer, on the Central Vermont Railroad, Essex Junction, Vermont, July 7, 1984" (NTSB/RAR-85/14)

CONCLUSIONS

Findings

1. The traincrews, operator, and train dispatcher involved were all qualified by carrier standards.
2. There was no evidence that defective equipment, defective track, and drug and alcohol use were factors in the accident.
3. The operator inadvertently sent train order 4 and the second Clearance Form A to the wrong train order office.
4. CSX management failed to issue and enforce specific procedures for traincrews to verify the accuracy of train orders before departing East Salamanca.
5. The CSX had not performed efficiency tests regarding the receipt of train orders by telecopier which would have revealed (1) the lack of procedures for verifying train orders, (2) the practice of transmitting Clearance Form As at the same time as the train orders, and (3) the absence of specific procedures for the destruction, when necessary and required by the operating rules, of Clearance Form As at unstaffed train order offices.
6. CSX management's supervision of employees was not adequate to detect rules violations.
7. The CSX did not take timely toxicological samples from the dispatcher and operator involved in this accident.

Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was the failure of CSX management to issue and enforce procedures for traincrews to verify the accuracy of train orders before departing East Salamanca, which permitted the undetected inadvertent transmittal of train orders to the wrong station.

RECOMMENDATIONS

As a result of its investigation of this accident, the National Transportation Safety Board reiterated Safety Recommendation R-85-129 and made the following recommendations.

--to CSX Transportation:

Evaluate procedures for the use of train order being transmitted by telecopier in nonsignaled territory to determine that safe operating practices are not being compromised. (Class II, Priority Action) (R-88-51)

Revise methods for conducting efficiency checks to place appropriate emphasis on critical safety activities. (Class II, Priority Action) (R-88-52)

--to the Federal Railroad Administration:

Evaluate use of train orders being transmitted by telecopier in nonsignaled territory to determine that safe operating practices are not being compromised. (Class II, Priority Action) (R-88-53)

Review the monitoring system for rule compliance on CSX Transportation to ensure that there is enforcement of the rules that provide for a safe and efficient operation. (Class II, Priority Action) (R-88-54)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JIM BURNETT
Chairman

/s/ JAMES L. KOLSTAD
Vice Chairman

/s/ JOHN K. LAUBER
Member

/s/ LEMOINE DICKINSON, JR.
Member

JOSEPH T. NALL, Member, did not participate.

June 7, 1988

APPENDIXES**APPENDIX A****INVESTIGATION**

The National Transportation Safety Board was notified of the accident about 11:50 a.m., on February 6, 1987. The Safety Board immediately dispatched investigators from its Atlanta Field Office and Washington, D.C. headquarters to the site.

Groups were formed to investigate the human performance, mechanical, operational, survival factors, toxicological, and track structure aspects of the accident. Parties to the investigation were CSX Transportation, the Federal Railroad Administration, the Brotherhood of Locomotive Engineers, the Brotherhood of Railway Signalmen, the United Transportation Union (Train & Engine), the New York State Department of Transportation, and emergency response personnel. The investigation was directed by Safety Board Investigators.

APPENDIX B
PERSONNEL INFORMATION

Dispatcher, Punxsutawney

F.D. Smith, Jr., 57, was employed by the Baltimore and Ohio Railroad on May 23, 1949, as a student operator. He worked various clerical and operator positions until his appointment to dispatcher on August 22, 1969. He attended a rules examination on May 12, 1986, and was last medically qualified on December 12, 1986.

Records indicate that during his employment, he had been reprimanded twice in the 1950's, commended four times, and suspended once. The suspension was for failure to record the delivery of a train order in June 1974. He was restored to service in July 1974.

Operator/Clerk, Punxsutawney

Donald C. Fetterman, 56, was employed by the Baltimore and Ohio Railroad on May 28, 1949 and had worked in various clerical positions. He had attended a class on rules instruction on December 11, 1986. He was last medically qualified on November 23, 1984.

In December 1984, the chief train dispatcher disqualified the operator from an assignment as Wire Chief at Punxsutawney. Records indicate that this disqualification was "directly attributable to an inability to qualify on the train and engine payroll portion of the position, as well as non-operating payroll."

Engineer, Extra 4443 North

Sidney T. Smith, 45, was employed by the Baltimore and Ohio Railroad on October 5, 1964, as a locomotive fireman and promoted to the position of engineer in 1972. He attended a rules examination on December 16, 1986, and was last medically qualified on December 15, 1985.

Conductor, Extra 4443 North

William Weir, Jr., 55, was employed by the Baltimore and Ohio Railroad on June 10, 1955. He was promoted to the position of conductor on July 27, 1960. He had attended a rules examination on April 19, 1986, and was last medically qualified on December 1, 1986.

Fireman, Extra 4443 North

Mark S. Ambuske, 34, was employed by the Baltimore and Ohio Railroad on June 16, 1976, and successfully completed his engineer training on December 17, 1978. He had attended a rules examination on December 16, 1986, and was last medically qualified on February 22, 1985.

Rear Brakeman, Extra 4443 North

D. L. Hoffman, 60, was employed by the Baltimore and Ohio Railroad on January 7, 1952, as a trainman. He was transferred to the position of brakeman on November 24, 1965. He had attended a rules examination on December 11, 1986, and was last medically qualified on November 11, 1986.

Front Brakeman, Extra 4443 North

David L. Varner, 52, was employed by the Baltimore and Ohio Railroad as a trainman on February 5, 1956. He transferred to the position of brakeman on May 6, 1977. He attended a rules examination on April 10, 1986, and was last medically qualified on June 17, 1985.

Engineer, Extra 4309 South

James R. Poole, 38, was employed by the Baltimore and Ohio Railroad as a fireman on June 23, 1966, and successfully completed his engineer training on February 6, 1977. He attended a rules examination on December 12, 1986, and was last medically qualified on September 30, 1986.

Conductor, Extra 4309 South

Louis J. Lalumia, 54, was employed by the Baltimore and Ohio Railroad on August 24, 1959, and promoted to the position of conductor on February 4, 1976. The Safety Board could not determine when he last attended a rules examination. He was last qualified medically on September 24, 1986.

Fireman, Extra 4309 South

Bradley J. Brown, 37, was employed by the Baltimore and Ohio Railroad on February 21, 1968, and was promoted to the position of engineer on June 19, 1976. He attended a rules examination on December 11, 1986, and was last medically qualified on November 10, 1986.

Rear Brakeman, Extra 4309 South

John C. Cournan, 45, was employed by the Baltimore and Ohio Railroad on March 19, 1977. He had attended a rules examination on April 23, 1986, and was last medically qualified on October 14, 1986.

Front Brakeman, Extra 4309 South

P.J. Trimble, 60, was employed by the Baltimore and Ohio Railroad on May 4, 1948, as a trainman, and was promoted to conductor on January 7, 1959. He attended a rules examination on April 26, 1986. CSX records indicate that he was overdue for a medical examination.

APPENDIX C
EXCERPTS FROM
CSX OPERATING RULES

The following are excerpts from the Chessie System Operating Rules that were in effect at the time of the accident:

MOVEMENT OF TRAINS

S-97. Trains must be authorized to run by train order Rule 235 S-G or 235 S-H except where the following rules are in effect; 89, 93, 105, 235 O, 235 W, S-241, S-242, 261, 265, 381, 525 or 605.

Where Rules 93, 265-272, or 605-670 are in effect within the limits of train order Rule 235 S-G or 235 S-H, those rules will take precedence over the order.

RULES FOR MOVEMENT BY TRAIN ORDER

209-A. If the required number of copies of train orders cannot be made at one writing, Operators must make others from the original copy and repeat to the Train Dispatcher from the new copies. They must retain a copy of each train order. The name of the original receiving Operator will be shown, with initials of the Operator who recopies the train order. The Train Dispatcher will make a notation in the train order book at the time of the repetition, but the original date and time completed will not change.

EXCEPTION

Duplicating machines may be used to reproduce or transmit train orders. Such copies must be legible and contain all information of the original order.

210-A. The Train Dispatcher and Operator are responsible for delivery of all orders addressed to a train, except when delivered by a member of a train or engine crew, or Yardmaster.

210-B. Engineers must show train orders to other employees on the engine. Conductors must show train orders when practicable to trainmen. Trainmen and other employees are required to read the orders, acknowledge their understanding and remind Engineers and Conductors of their contents when practicable to do so.

211-A. A Clearance Form "A" must be delivered together with all train orders to each person addressed. Conductors and Engineers must, and when practicable trainmen will, see that the Clearance Form "A" is properly addressed and the information shown thereon corresponds with the train orders received.

After a Clearance Form "A" has been OK'd by the Train Dispatcher and it becomes necessary to issue a second Clearance Form "A", all copies of the first Clearance Form "A" must be destroyed except for the Operator's copy which must be marked "VOID" and kept on file. The second Clearance Form "A" must show all train orders addressed to the train at that office.

214. When a train order has been repeated, and before "Complete" has been given, the order must be treated as a holding order for the train addressed, but must not be otherwise acted on until complete has been given.

If the means of communication fails before an employee has repeated an order, the order for that employee is of no effect and must be treated as if it had never been sent.

215. When a train order is to be used to protect a train, equipment or condition and the order cannot be placed at an open train order office, such order will be addressed to "Dispatcher" made complete in the usual manner and notation made in the address "Dispatcher protect". When so addressed, trains will not be authorized to enter the territory affected until they have received a copy of the order.

217. A train order to be delivered to a train at a point not a train order office or at which the office is closed, must be addressed "C&E...at (or between)...care of...", and forwarded and delivered by the Engineer or other person in whose care it is addressed and who is responsible for its delivery.

The number of such train orders must be shown in the usual manner on Clearance Form "A" of the train making the delivery and on a separate Clearance Form "A" for the train addressed.

When the superiority of the train is thereby restricted, "Complete" must not be given to a train order for an inferior train until the Train Dispatcher has received advice that the train order has been delivered to the Conductor and Engineer of the superior train.

APPENDIX D
TRAIN ORDER NO. 1

NSD-420 Form COT 40
Rev. 4-69
Made in USA

TRAIN ORDER NO. 1 DATE FEBRUARY 19 87

TO C&E By 4443 at Shennock VEG of NX

AT NX

THIS MARGIN NOT TO BE WRITTEN UPON

THIS MARGIN NOT TO BE WRITTEN UPON

*By 4443 see other
Clipboard to get
Boat Cuffel's name*

D.D.A.

MADE COMPLETE 4/12 D Letherman Opt

Each employee addressed must be delivered a copy of order.

APPENDIX E

TRAIN ORDER NO. 2

TRAIN ORDER NO. <u>2</u>		DATE <u>FEBRUARY 6</u> 19 <u>87</u>
TO <u>C&E EXTRA 4443 NORTH AT SALAMANCA VIA OP NX</u>		
AT <u>NX</u>		
EFFECTIVE 401 AM TODAY FOLLOWING MOVEMENTS ARE NOT PERMITTED BEHIND EXTRA 4443 NORTH BETWEEN ASHFORD AND YARD LIMIT BOARD BUFFALO CREEK		
F.D.S.		
MADE COMPLETE <u>416</u> <u>A</u> M. <u>FETTERMAN</u>		
Each copy of order addressed must be delivered a copy of order.		

THIS MARGIN NOT TO BE WRITTEN UPON

THIS MARGIN NOT TO BE WRITTEN UPON

APPENDIX G
TRAIN ORDER NO. 4

TRAIN ORDER NO. 4 DATE FEBRUARY 6 1917

TO EXTRA 4443 NORTH AT SALAMANCA VIA OP NX
AND EXTRA 4309 SOUTH AT BUFFALO CREEK
VIA OP NX

AT NX

EXTRA 4443 NORTH TAKE SIDING AND MEET EXTRA 4309 SOUTH AT
EAST CONCORD.

F.D.S.

MADE COMPLETE 505 A.M. FETTERMAN

Each copy of order must be delivered a copy of order.

THIS MARGIN NOT TO BE WRITTEN UPON

THIS MARGIN NOT TO BE WRITTEN UPON

APPENDIX H
SECOND CLEARANCE FORM A

CLEARANCE FORM A

STATION NX DATE FEBRUARY 6 1947
C&E Tran 4442 north and south via NX

I have 3 order/s and 2 message/s for your train. (If no orders or messages operator will so state). Orders No. 1

No. 2 No. 4 No. No. No. No. No. No. No. No. No.
No. No. No. No. No. No. No. No. No.
No. No. No. No. No. No. No. No. No.
No. No. No. No. No. No. No. No. No.
No. No. No. No. No. No. No. No. No.

MESSING SYSTEMS DIVISION
NEW HART MADE IN U.S.A.

Latest Superintendent's Supplement in effect or to become effective
PITTSBURGH BUFFALO Div./Dist. No. 5-12-5
Div./Dist. No.
Div./Dist. No.
Div./Dist. No.

Manual Block Must be shown "Clear" or "Occupied"
Between _____
and _____
Between _____
and _____
Between _____
and _____

Trains ahead must be listed if block is occupied

2	TRAIN	BETWEEN

You are authorized to occupy _____
3 between _____ and _____
and _____
between _____ and _____

per Rule S 241
Time Ok 506 A S.D.S. Train Dispatcher
H. Allen Operator

APPENDIX I

SUPERINTENDENT'S BULLETIN
SUPPLEMENT S-7-ACHESSIE SYSTEM
PITTSBURGH DIVISION
OFFICE OF SUPERINTENDENT-OPERATIONS

BUFFALO DISTRICT SUPERINTENDENT'S BULLETIN SUPPLEMENT S-7-A

Pittsburgh, Pa., July 8, 1985 bad

ALL CONCERNED: MAIN LINE 2ND AND MAIN LINE 3RD SUBDIVISION

EFFECTIVE: 11:00 PM, FRIDAY, JULY 12, 1985

MAIN LINE 2ND SUBDIVISIONTIMETABLE MODIFICATION

ITEM:

1. TTSI 59.02, TRAIN ORDER OFFICE OPEN, Page 46, is modified to delete East Salamanca (SI) as a Train Order office.
 - A. Buffalo District Superintendent's Bulletin No. 7, Item 68 on Page 12, is modified in part, to delete East Salamanca as Train Order office. Remainder of item unchanged.
2. TTSI 59.03, DESIGNATION AND USE OF MAIN TRACKS, Page 46, is modified in part, to read as follows for track section between East Salamanca and Killbuck:

BETWEEN	AUTHORITY FOR MOVEMENT	TRACK/S
East Salamanca MP 106.9 and Killbuck MP 108.0	Rule 93	Two

TTSI 59.03, Note 1, is cancelled.

3. TTSI 59.10, LOCATION OF STANDARD CLOCKS, BULLETINS AND NOTICES, Page 49, is modified, in part, to read:

STATION	STANDARD CLOCK	BULLETINS & NOTICES
East Salamanca	Yard Office	Yard Office

Remainder of TTSI 59.10, is unchanged.

4. TTSI 59.17, RADIO BASE STATIONS, Page 50 is modified to delete Salamanca as a Base Station.
5. TTSI 59.20, ADDITIONAL INSTRUCTIONS APPLYING TO OPERATING RULES, Item C, Rule 81, TRAIN PROFILE REPORT, Page 50, is modified to read as follows:

Salamanca: Inbound crew will leave Train Profile Report on engine for use of outbound crew.

BUFFALO DISTRICT SUPERINTENDENT'S BULLETIN SUPPLEMENT S- July 8, 1985

MAIN LINE 2ND SUBDIVISION (Concluded)

TIMETABLE MODIFICATION (Concluded)

ITEM:

6. TTSI 59.20, ADDITIONAL INSTRUCTION APPLYING TO OPERATING RULES, Item E, Rule 93, Yards, Page 50, is cancelled.

MAIN LINE 3RD SUBDIVISION

TIMETABLE MODIFICATION

7. TTSI 60.02, TRAIN ORDER OFFICES OPEN, Page 51, is modified to delete East Salamanca (SI) as Train Order office.
8. TTSI 60.03, DESIGNATION AND USE OF MAIN TRACKS, Page 52, is modified in part to read as follows for track section between North End East Salamanca and East Salamanca:

BETWEEN	AUTHORITY FOR MOVEMENT	TRACK/S
North End East Salamanca Yard and East Salamanca	Rule 93	Two

TTSI 60.03, Note 3, is cancelled.

9. TTSI 60.10, LOCATION STANDARD CLOCKS, BULLETINS AND NOTICES, Page 54, is modified, in part, to read:

STATION	STANDARD CLOCK	BULLETIN & NOTICES
East Salamanca	Yard Office	Yard Office

Remainder of TTSI 60.10 is unchanged.

10. TTSI 60.20, ADDITIONAL INSTRUCTIONS APPLYING TO OPERATING RULES, Item E, Rule 81, Train Profile Report, Page 55, is modified as follows:
- Trains originating will receive Train Profile report at Buffalo.
 - Salamanca: Inbound crew will leave Train Profile report on engine for use of outbound crew.

D. R. Danie's
Superintendent-Operations

RETARDERS GIVE A SAVINGS SQUEEZE - CONTROL CAR COUPLING SPEEDS PLEASE.

APPENDIX J
TRAINMASTER'S BULLETIN No. 4



East Salamanca, New York
July 12, 1985

TRAINMASTER'S BULLETIN #4

TO ALL SALAMANCA AREA EMPLOYEES

Procedure for entering Salamanca Yard Office and signing up train after 3:00 P.M. weekdays and all day Saturday, Sundays, and Holidays.

Entrance door to station building is secured with switch lock. To enter Yard Office use switch key to open box on wall by door. Inside box is a key to the Yard Office door. After opening door, replace key in box and lock the box. Inside the office a Telecopier machine is setting on a table beside the Operators desk. The orders and any messages will be on the Telecopier. After receiving your orders and messages the Conductor will call Riker Operator at 231, 242, or 1-814-938-5504. He will verify the order numbers and messages with the Operator. The Operator will then complete the Form A and transmit same on the Telecopier.

The Conductor can tell the Operator at Riker the radio numbers.


S. F. Snow
Trainmaster

APPENDIX K

ADMINISTRATIVE WIRE MESSAGE
JULY 12, 1985

0001 ROCHEY BUFFAY EASNY PUNKSY 01M

PUNKSUTANNEY, PA. JULY 12TH 1985

ALL CONDS., ROCHEY
ALL CONDS., BUFFAY
ALL CONDS., EASNY
ALL CONDS., PUNKSY
ALL CONDS., PUNKST
01M 1985 JBA JLS LLR FLG PUNKST

EFFECTIVE 1100PM THIS DATE 7/12/85 ALL TRAIN ORDERS AND MESSAGES
FOR CREWS ORIGINATING AT SALAMANCA WILL BE GIVEN TO THE OPERATOR
AT RIKER WHO WILL TELECOPY TO SALAMANCA NY. CONDUCTOR AT
SALAMANCA SHOULD CALL THE OPERATOR RIKER FOR FORM "A"

F L GIGLIOTTI AGENT

APPENDIX L

SUPERINTENDENT'S BULLETIN
SUPPLEMENT S-7-BCHESSIE SYSTEM
PITTSBURGH DIVISION
OFFICE OF SUPERINTENDENT-OPERATIONS

BUFFALO DISTRICT SUPERINTENDENT'S BULLETIN SUPPLEMENT S-7-B

Pittsburgh, Pa., July 11, 1985 bad

ALL CONCERNED: MAIN LINE 2ND AND MAIN LINE 3RD SUBDIVISION

EFFECTIVE: 7:00 AM, TUESDAY, JULY 16, 1985

MAIN LINE 2ND SUBDIVISION

ITEM:

- Item 1 on Buffalo District Superintendent's Bulletin Supplement is cancelled.
- TTSI 59.02, TRAIN ORDER OFFICE OPEN, Page 46, is modified as:

OFFICE	OFFICE HOURS		REMARKS
	FROM	TO	
E. Salamanca (SI)	7:00AM	3:00PM	Monday thru Fri.

MAIN LINE 3RD SUBDIVISION

- Item 7 on Buffalo District Superintendent's Bulletin Supplement is cancelled.
- TTSI 60.02, TRAIN ORDER OFFICE OPEN, Page 51, is modified as:

OFFICE	OFFICE HOURS		REMARKS
	FROM	TO	
E. Salamanca (SI)	7:00AM	3:00PM	Monday thru Fri.

D. R. Daniels
Superintendent-Operations

RETARDERS GIVE A SAVINGS SQUEEZE - CONTROL CAR COUPLING SPEED