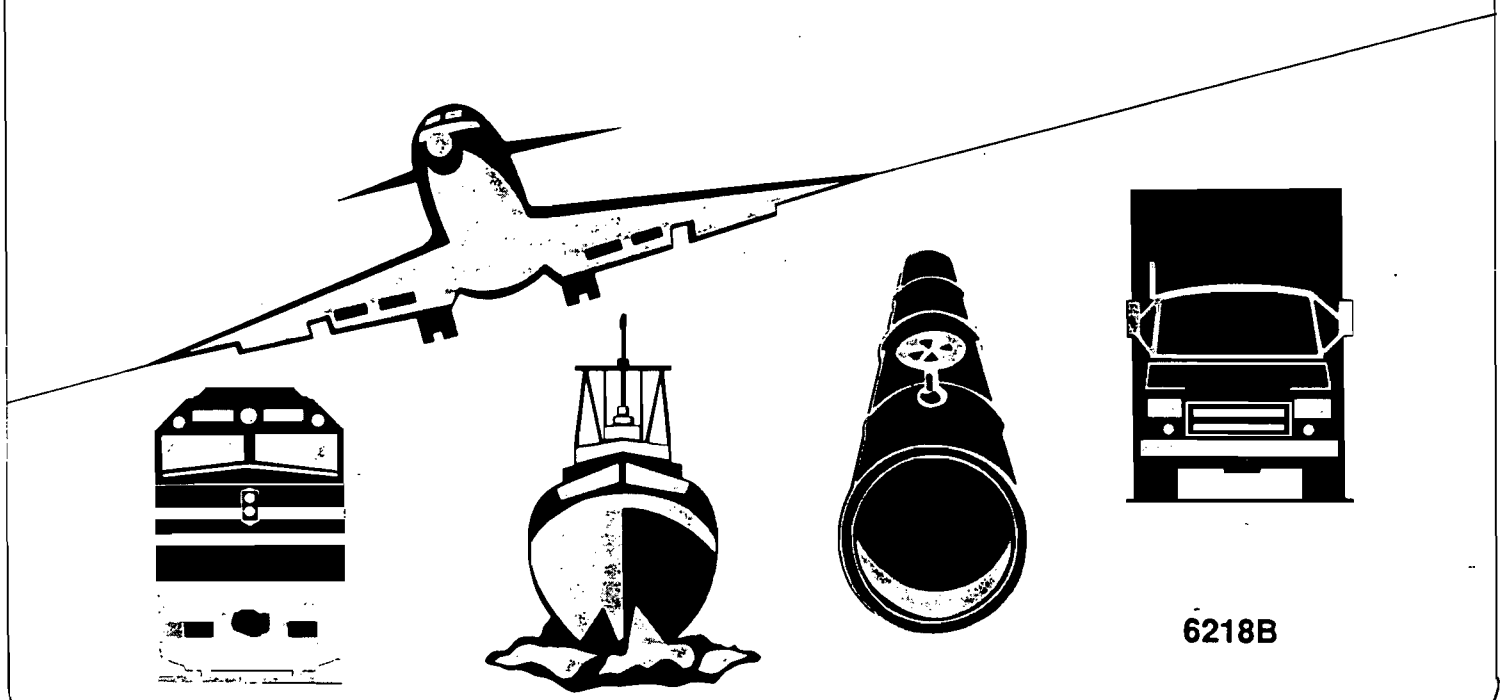
PB94-910405
NTSB/AAR-94/03

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

AIRCRAFT ACCIDENT REPORT

CONTROLLED FLIGHT INTO TERRAIN
FEDERAL AVIATION ADMINISTRATION
BEECH SUPER KING AIR 300/F, N82
FRONT ROYAL, VIRGINIA
OCTOBER 26, 1993



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Adopted: April 12, 1994
Notation 6218B

Abstract: This report explains the crash into mountainous terrain of a Beech Super King Air 300/F, N82, owned by the Federal Aviation Administration, near Front Royal, Virginia, on October 26, 1993. The safety issues discussed in the report focused on the Federal Aviation Administration's flying program operations and the flight safety management system. Recommendations concerning these issues were addressed to the Federal Aviation Administration.

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EXECUTIVE SUMMARY

On October 26, 1993, about 1552, N82, a Beech Super King Air 300/F, owned by the Federal Aviation Administration and operated by the Atlantic City, New Jersey, Flight Inspection Area Office, was destroyed when it crashed into mountainous terrain near Front Royal, Virginia. The three flight crewmembers aboard received fatal injuries.

The National Transportation Safety Board determines that the probable causes of this accident were the failure of the pilot-in-command to ensure that the airplane remained in visual meteorological conditions over mountainous terrain, and the failure of Federal Aviation Administration executives and managers responsible for the FAA flying program to: (1) establish effective and accountable leadership and oversight of flying operations; (2) establish minimum mission and operational performance standards; (3) recognize and address performance-related problems among the organization's pilots; and (4) remove from flight operations duty pilots who were not performing to standards.

The safety issues in this report focused on the Federal Aviation Administration's flying program operations and the flight safety management system.

Eight Priority Action safety recommendations concerning these issues were addressed in this report to the Federal Aviation Administration. Also, as a result of the investigation of this accident, on November 24, 1993, the Safety Board issued one Urgent Action recommendation and seven Priority Action recommendations to the Federal Aviation Administration that are contained in Appendix D of this report.

NATIONAL TRANSPORTATION SAFETY BOARD
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1. FACTUAL INFORMATION

1.1 History of the Flight

On October 26, 1993, about 1552,[1] N82, a Beech Super King Air 300/F (BE-300/F), owned by the Federal Aviation Administration (FAA) and operated by the Atlantic City (ACY), New Jersey, Flight Inspection Area Office (FIAO), was destroyed when it crashed into mountainous terrain near Front Royal, Virginia. The three flight crewmembers aboard received fatal injuries.

The airplane had departed the nearby Winchester Regional Airport (W16) in visual meteorological conditions (VMC) on a routine point-to-point flight to Newport News/Williamsburg International Airport (PHF), Virginia. Witnesses described low clouds that were consistent with instrument meteorological conditions (IMC) in the area of the accident site, which was about 15 miles south of the departure airfield. An instrument flight rules (IFR) flight plan to PHF was on file in the air traffic control (ATC) system, but the flight plan had not yet been activated. The flight was operating under the provisions of Title 14 Code of Federal Regulations (CFR), Part 91.

The three flight crewmembers of N82 were assigned to inspect airways facilities at several airports during a scheduled 5-day work week, beginning on Monday, October 25, 1993. The pilot-in-command (PIC) and the electronic technician (ET) had been off duty the previous weekend. The second-in-command (SIC) pilot had worked over the weekend with another flightcrew.

[1] All times herein are eastern daylight time, in accordance with the 24-hour clock.

Upon reporting for work on the morning of October 25, the flightcrew was notified that their assigned airplane was not operational due to maintenance. The mission was rescheduled for the following day, and the flightcrew proceeded with nonflying duties.

On Tuesday, October 26, the flightcrew planned a morning departure to inspect the instrument landing system (ILS) localizer at W16; however, they incurred another maintenance delay. While the maintenance was underway, the flightcrew remained at the FIAO facility performing nonflying duties.

FIAO personnel stated that they observed the flightcrew in the office environment, that they appeared to be in good health and spirits, and that they did not express any complaints.

The PIC met with the FIAO manager in the late morning. He explained that the ground technician servicing the Winchester Airport ILS was required to drive 3 hours each way to the airport. The PIC expressed his concern that the previous day's mission had been canceled due to airplane maintenance, and this had caused a round trip inconvenience to the ground technician. The PIC expressed a desire to complete the inspection procedure at Winchester that day. He suggested that if he departed from ACY by 1400, he could finish the mission and still proceed to his planned over-night stop. The FIAO manager gave the PIC verbal approval for 1 hour of overtime for the flightcrew of N82 to complete the mission.

About midday, the PIC of N82 filed an IFR flight plan to Winchester Airport with the Millville, New Jersey, Automated Flight Service Station, received a weather briefing from the Direct User Access Terminal System (DUATS), and departed ACY at 1332.

The flight from ACY to Winchester was uneventful. The PIC[2] made initial contact with the Washington Dulles International Airport (IAD) approach control at 1408. Several transmissions were made between N82 and the controller concerning the type of approach, weather conditions and whether N82 could

[2] Air traffic control recording tapes from conversations between N82 and IAD approach control were examined in the Safety Board's Engineering Services Laboratory in Washington, D.C., in the presence of the FIAO manager. He identified the voice on all transmissions from N82 as that of the PIC. It was also his very strong opinion that the PIC would have been seated in the right cockpit seat in order to handle all communications. He opined that in accordance with ACY custom, the SIC would therefore have been the pilot flying from the left cockpit seat.

maintain visual flight rules (VFR). During one of the transmissions, the controller advised N82 that the minimum vectoring altitude in the area of the Winchester facility was 4,000 feet. After discussion, the PIC advised the controller that they would execute the full ILS approach to Winchester. At 1421, the controller cleared N82 for the ILS approach. About 1430, the PIC of N82 canceled their IFR clearance and advised the controller "we're going to maintain two thousand and ah appreciate provide us VFR advisories at two thousand feet going back and forth across the localizer." The controller responded that he would comply with the request.

The IAD approach control area of responsibility divides in the vicinity of the Winchester Airport. When N82 reached the edge of the south controller's area of responsibility, the flight was given a frequency change to the IAD west arrival controller.

N82 was still operating under VFR when the PIC contacted the west controller around 1444. About 1450, the PIC asked the controller "what's the lowest altitude IFR you can give us." The controller responded with "the lowest there is three thousand and...that's only from where you are for a little while, most of where you, south of you, is four thousand, is my minimum vectoring altitude." The PIC then requested, and the controller issued, an IFR clearance to 4,000 feet to complete the inspection of the ILS localizer.

While flying the ILS approach, the PIC stated to the controller,"...you can cancel IFR and...we'll...land out of this and...we'll call you when we jump up again if you could...work something up down near Harcum to Newport News." The controller acknowledged the request and advised, "affirmative we'll put something in for you."[3]

The ground technician at the Winchester Airport stated that he made radio contact with N82 about 1400 and that the flight inspection began between 1415 and 1425. At the completion of the flight inspection, he observed the airplane land on runway 32, taxi back to the runway threshold, and remain there for about 3 minutes to complete the ILS facility check.

Prior to N82's departure, the ground technician invited the flightcrew for coffee in the airport terminal. The PIC declined the offer stating they were

[3]This conversation pertained to filing an IFR flight plan to PHF.

behind schedule and needed to get on to the next destination. The PIC advised the technician to have a safe drive back to Richmond, Virginia, because the weather was worsening along the way.

Winchester Airport personnel observed N82 take off and depart the airport area. The airplane remained clear of the clouds and appeared to be in VMC.

The first record of an attempt by the flightcrew of N82 to obtain an IFR clearance after departure[4] was at 1541.[5] The PIC contacted IAD approach control and advised, "just off of Winchester, see if you got...anything you can give us heading on down towards Harcum." The west arrival controller advised N82 to, "maintain VFR for right now, it's going to be about 5 minutes before I can get to you, I'm extremely busy at the moment."

At 1548, transcripts indicate that the PIC attempted to communicate; however, transmissions from the airplane were largely unintelligible. At 1549, the PIC reported, "we're over Linden VOR [very high frequency omnidirectional radio range] at 2,000, can you get us a little higher, VFR on top and we'll be on our way."[6]

At 1550, the IAD approach controller replied to N82, "standby, I have traffic just over the VOR right now descending to five, he's out of seven point five...." There was an unintelligible aircraft response. The controller then stated, "O.K. thanks, standby one - and I'll have an IFR clearance for you in just a moment."

At 1552, the controller advised N82 to "maintain VFR please and can you contact Dulles on one two four point six five, you're just about to enter his

[4]Organizational directives stated, "A VFR or IFR flight plan or ATC flight following is required for each flight. When flight plan filing facilities are not available, the flight plan may be filed in the air immediately after departure...."

[5]The Winchester Regional Airport does not have an active control tower. A remote communication outlet (RCO) is available on the airport to provide direct contact with IAD approach control. (See section 1.10 for more information.)

[6]The Linden (LDN) VOR is approximately 17 miles south-southwest of the Winchester Airport. The transmitter site is on top of a mountain at 2,472 feet mean sea level (msl) and is within a published "Designated Mountainous Area." The valley elevation west of the VOR is approximately 700 feet msl. The mountain ridges extend upward to 4,000 feet on both sides of the valley. The Washington VFR sectional aeronautical chart depicts the Linden VOR in a 30-nautical mile (nmi) quadrangle with a published maximum elevation figure (MEF) of 4,400 feet. The MEF represents the highest known feature of terrain and obstructions within that quadrangle.

airspace down there." This action was intended to forward N82 to the south arrival controller for an IFR altitude assignment and clearance to the destination. There were no further transmissions received from N82. After the west controller was relieved of his position, he asked the south controller if he had contact with N82. The south controller still had the inactivated flight strip in front of him. He related that the accident airplane, N82, never "came up" on his frequency. The area manager was then informed of the possible accident.

Several witnesses in the area of Front Royal, Virginia, observed a twin engine, silver and blue airplane about the time of the accident orbiting in and out of the clouds. One witness reported that the tops of the hills in the area were covered with fog. A witness driving a truck very close to the accident site reported that he heard a "smooth" noise getting louder and coming closer, a "swoosh" for 3 or 4 seconds, a loud "whack," and that he then saw explosions and parts flying.

The airplane struck trees about 1552 in daylight conditions along a ridge line about 1,770 feet msl and came to rest in a wooded area at approximately 38 degrees, 54 minutes north latitude, and 78 degrees, 7 minutes west longitude.

1.2 Injuries to Persons

Injuries	Flightcrew	Other	Total
Fatal	3	0	3
Serious	0	0	0
Minor/None	0	0	0
Total	3	0	3

1.3 Damage to Aircraft

The airplane received major structural damage as it made initial contact with trees. Tree limbs more than 8 inches in diameter were fractured. Much of the airplane was destroyed by impact, and it was largely consumed in a postcrash fire. The value of the airplane was estimated at around $4,000,000.

1.4 Other Damage

The initial impact was within a National Park Service forest preserve. There was no property damage other than trees.

1.5 Personnel Information

The flight crewmembers of N82 were qualified in accordance with applicable FAA and operating unit regulations and procedures.

1.5.1 Pilot in Command (PIC)

The PIC, age 55, born July 9, 1938, held Airline Transport Pilot Certificate No. 1911260 for single and multi-engine land, and was type rated in the Jet Commander, BE-300, BE-300/F and the BE-1900. He also held an Airspace System Inspection pilot certificate, issued on November 15, 1990. He held a flight instructor certificate for airplane single and multi-engine land that expired on September 30, 1991. His total flying experience was about 6,700 hours, of which approximately 2,000 hours were in the BE-300.

His last proficiency check in the BE-300 was in September 1993; his last BE-300 simulator pilot refresher course was in April 1993; and his last mission check was in February 1993. He accrued approximately 38 hours of flight time in the preceding 30 days, 67 hours of flight time in the preceding 60 days, and 108 hours of flight time in the past 90 days.

His most recent FAA first class medical certificate was issued on September 3, 1993, with the limitation that corrective lenses shall be worn for near and distant vision while exercising the privileges of his airman certificate. The visual acuity listed on this record was 20/400, corrected to 20/25. A review of previous records revealed that a visual acuity of 20/200 was documented back to 1966. A waiver of demonstrated ability for limited vision was issued by the FAA Medical Certification Branch in February 1973, January 1986, January 1990, and updated in October 1992.

1.5.1.1. PIC Background Information

The PIC retired from the U. S. Air Force in 1977, as a noncommissioned officer. His last military assignment was in meteorology. He

obtained his pilot certificates and ratings independent of his military duties during nonduty time. He held a commercial pilot certificate with flight instructor rating and appropriate second class medical certification intermittently from 1971 through 1985. After retiring from the Air Force, he attended the University of Hawaii and earned a Bachelor's degree. He was hired by the FAA in 1983 as an air traffic assistant. In 1985, he attained his initial airman instrument-airplane rating. His first flight exam for the airline transport pilot (ATP) certificate was unsatisfactory, and he earned the ATP certificate in 1986. In October 1987, he was selected for a position as an airspace system inspection pilot in the ACY FIAO. This position in ACY was in the procedures section where, in addition to developing instrument procedures, he also served as a SIC for flight inspection.

The PIC remained in the flight procedures section for about 2 1/2 years. His supervisor stated that prior to upgrading to PIC, he had developed a maximum of 12 instrument procedures at the time of his upgrade. He added that the PIC was slow in developing the procedures and appeared uninterested in instrument procedures development work. The supervisor further stated that there were significant objections to his selection for the PIC position. Several of the SICs expressed a desire not to fly with him at that time.

The FAA airmen records also revealed that the PIC failed his first two check rides in his attempt to obtain a BE-300 type rating. The first attempt resulted in an unsatisfactory oral test on February 15, 1989. He reportedly received additional formal training. The second attempt resulted in unsatisfactory instrument procedures on February 21, 1989. He returned to his unit and later received approval to attend the upgrade course again. On April 4, 1989, his third attempt at the BE-300 type rating was satisfactory. He was upgraded to PIC in the BE-300 on November 18, 1990.

The PIC requested transfers from the ACY FIAO on three different occasions (1988, 1989, 1991) to either Tokyo, Japan, or Honolulu, Hawaii. His supervisors denied each request due to what they said was a shortage of qualified personnel at the ACY FIAO.

During interviews at the Atlantic City FIAO, Safety Board investigators were told by flight crewmembers that the PIC involved in the accident had demonstrated poor judgment on previous flights. It was alleged that he:

Continued on a VFR positioning flight into IMC,

Conducted VFR flight below clouds at less than 1,000 feet above the ground in marginal weather conditions,

Replied to an ATC query that the flight was in VMC when it was in IMC,

Conducted departures without the flightcrew's knowledge of essential flight planning information, such as IFR/VFR/en route filing/weather briefing/ultimate destination or routing,

Departed on positioning flights without informing other crewmembers whether he had obtained weather information or filed an appropriate flight plan,

Disregarded checklist discipline on numerous occasions,

Refused to accept responsibility that his failure to adhere to a checklist had caused an engine damage incident in January 1993,

Performed a "below glide path check" in IMC when VMC conditions were required by FIAO requirements, and refused to answer a SIC query regarding the reason for his alleged violation of VFR requirements in an incident 2 weeks before the accident.

Following this incident, the SIC formally complained to the flight operations/scheduling supervisor (FO/SS) for management resolution of this matter; however, no action was taken, and no one above the FO/SS was informed of the incident. Those interviewed indicated that other complaints were handled in a similar manner. Following some of these complaints, the FO/SS, in the most recent performance appraisal period, rated the PIC "proficient" on his interpersonal skills and complimented him on his productivity and ability to "get along with his fellow workers."

1.5.1.2 Medical Records/DUI Information

A review of the PIC's FAA medical records revealed that he had received two convictions for driving under the influence (DUI) of alcohol, the

most recent event occurring in May 1991, when his New Jersey driver's license was suspended. His medical records revealed that his first DUI occurred in the summer of 1987. In accordance with 14 CFR 67.20 (1), the PIC was required to report the conviction on his application for an airman medical certificate. He reported the conviction in a letter, dated March 29, 1989, to the FAA's Civil Aeromedical Institute (CAMI). In response, CAMI admonished him to fully report any history of traffic violations on his airman medical certificate applications.

In May 1991, the captain was convicted again of a DUI offense in New Jersey. Subsequently, his New Jersey driver's license was suspended while he held a PIC position at the ACY FIAO. Although he reported this conviction correctly on his airman medical certificate application of September 26, 1991, he did not report the conviction within 60 days to the FAA's Civil Aviation Security Division, as required under 14 CFR 61.15(c). The FAA could have denied his airman certification, and personnel action could have been taken against him as an FAA employee. The Safety Board was unable to determine why FAA action was not taken.

A review of the PIC's New Jersey DMV driver's record revealed that his New Jersey driver's license was also suspended on January 18, 1993, for nonpayment of the automobile insurance surcharge. It was suspended again on March 1, 1993, because he failed to comply with the state alcohol and drug Counter Measures Program, and it was still suspended at the time of the accident.

Although the PIC had not resided in Mississippi for more than 20 years, he maintained a Mississippi driver's license, which was last renewed on July 29, 1993. New Jersey law requires that as part of the license application process, applicants must relinquish another state's license.

1.5.1.3 PIC Performance History

In January 1993, the PIC received a letter of reprimand from the flight operations/scheduling section supervisor (FO/SS) stating, "...While readying the aircraft for flight you failed to follow required standard operating procedures which resulted in substantial damage to the left engine....Specifically, you failed to follow the appropriate checklist. Additionally, there appears to have been a lack of communication and coordination between you and your second-in-command...."

According to the FO/SS, the PIC was upset with the reprimand and believed that he should not be held responsible because the SIC was responsible for starting the engines and he, the PIC, was looking elsewhere at the time of occurrence.

The manager of the Airspace Systems Assurance Division, Oklahoma City (OKC), reported that the PIC was involved in another incident in the summer of 1993, while he was on temporary assignment to the OKC FIAO. During a long taxi to the runway, the airplane had to be slowed down more than normally expected, and the brakes would not hold during the pretakeoff checks. The airplane was then taxiied back to the ramp, and maintenance personnel found that the brakes were overheated and required replacement. Maintenance personnel also found that the ground idle/low pitch stop circuit breaker was popped. This condition simulated "weight off the wheels" and set the engine power to flight idle, accounting for the tendency of faster taxi speed. This circuit breaker is in an area that is accessible to the pilot in the right seat. The PIC on the accident flight occupied the right seat during this incident. No operations investigation took place as a result of the incident, and no disciplinary action was taken against the flightcrew.

1.5.2 Second in Command (SIC)

The SIC, age 50, born May 16, 1943, held ATP certificate No. 1688411 for airplane multi-engine land, with type ratings in the DC-3, NA-265, SF-340, BE-300, BE-300F, BE-1900, and the HS-125. He held commercial pilot privileges for airplane single-engine land and rotorcraft helicopter, instrument helicopter, and glider aerotow. He held a current flight instructor certificate, issued on May 5, 1993, for airplane single and multi-engine land, instrument airplane. His total flying experience was about 13,800 hours, of which approximately 1,000 hours were in the BE-300.

The SIC received his initial training and type rating in the BE-300 in December 1989. His last proficiency check in the BE-300 was accomplished in January 1993, and his last BE-300 simulator pilot refresher course was in May 1993. All check rides and evaluations were satisfactory. He had accrued approximately 13 hours of flight time in the preceding 30 days, 50 hours of flight time in the preceding 60 days, and 79 hours in the past 90 days.

The SIC's most recent FAA first class medical certificate was issued on May 20, 1993, with the limitation that the holder shall wear corrective lenses while exercising the privileges of his airman certificate.

The SIC's FAA airman record from 1966 contained his commercial pilot certificate and instrument rating. He attained an Airline Transport Pilot (ATP) rating in 1973. Thereafter, he worked as a corporate pilot and also flew for the National Guard. He was employed by the FAA in July 1989 as an Airspace System Inspection Pilot, GS-09, in the ACY FIAO. The primary duties of this position were to develop instrument procedures. He also served as a SIC for flight inspection. Within 30 months of employment, he had progressed to full performance level in the procedures section as a GS-13. He also served as the ACY additional duty flight safety officer (FSO) for more than 1 year during 1992 and 1993.

The SIC's FAA medical records revealed that he had reported a DUI conviction for June 16, 1992.

1.5.3 Electronic Technician (ET)

The ET, age 55, born June 27, 1938, held an FAA electronic technician certificate issued by AVN. Although not required for his position, he held a student pilot certificate, issued on July 9, 1993.

The ET had accrued approximately 15 hours of flight time as an ET in the preceding 30 days, 27 hours of flight time in the preceding 60 days, and 69 hours in the past 90 days. A record of his total historical flight time was not available. His flight time for fiscal year 1993 was about 184 hours, and an estimate for his 20 years was 6,000 hours as a technician.

The ET's most recent FAA third class medical certificate was issued on July 9, 1993, with the limitation that the holder shall wear corrective lenses for near vision while exercising the privileges of his airman certificate.

The ET had been employed by the FAA in the flight inspection program for over 20 years. He had been assigned to several FIAOs including Tokyo and Honolulu. He was assigned to the ACY FIAO in June 1993.

1.5.4 Flight Operations/Scheduling Supervisor (FO/SS)

The FO/SS began employment with the FAA as an airways facility technician in 1961. In 1963, he transferred to the Kennedy Airport FIAO as an ET. He remained with the FIAO when the office moved to ACY in 1964. In 1971, he upgraded to pilot and flight inspection status. He was promoted to supervisor of the flight inspection section in 1983. He holds an ATP certificate and has about 9,600 hours of pilot flight experience.

The FO/SS directly managed all the PICs and an aircraft dispatcher. He also managed the electronic technicians through an ET supervisor. FIAO personnel described the FO/SS position as similar to a domicile chief pilot in a scheduled air carrier operation (see figure 1).

1.5.5 Flight Inspection Area Office (FIAO) Manager

The FIAO manager is a retired U. S. Air Force officer pilot. He has been with the FAA for almost 20 years in both Flight Standards and Flight Inspection offices. He accrued more than 13,000 flight hours in various airplanes, with type ratings in the Boeing 727 and the Sabreliner. He described himself as full performance in inspection procedures, and as a full performance procedures PIC. He had been the FIAO manager for about seven months at the time of the accident.

The FIAO manager was responsible for all functions of a self-supporting location, such as operations, aircraft maintenance, administration, and financial management.

1.5.6 Manager, Airspace System Assurance Division

The Manager, Airspace System Assurance Division (AVN-800), located in OKC, is a retired U. S. Air Force officer pilot. He was employed in the private sector as a corporate pilot for 3 years prior to joining the FAA in 1977. He possesses an ATP certificate and has about 7,000 hours of flight experience.

He was initially trained in flight inspection and instrument flight procedures. He taught terminal en route procedures (TERPS) at the FAA Academy for 3 years. From 1983 to 1985, he worked in Saudi Arabia for the International Civil Aviation Organization (ICAO) as a technical advisor. From

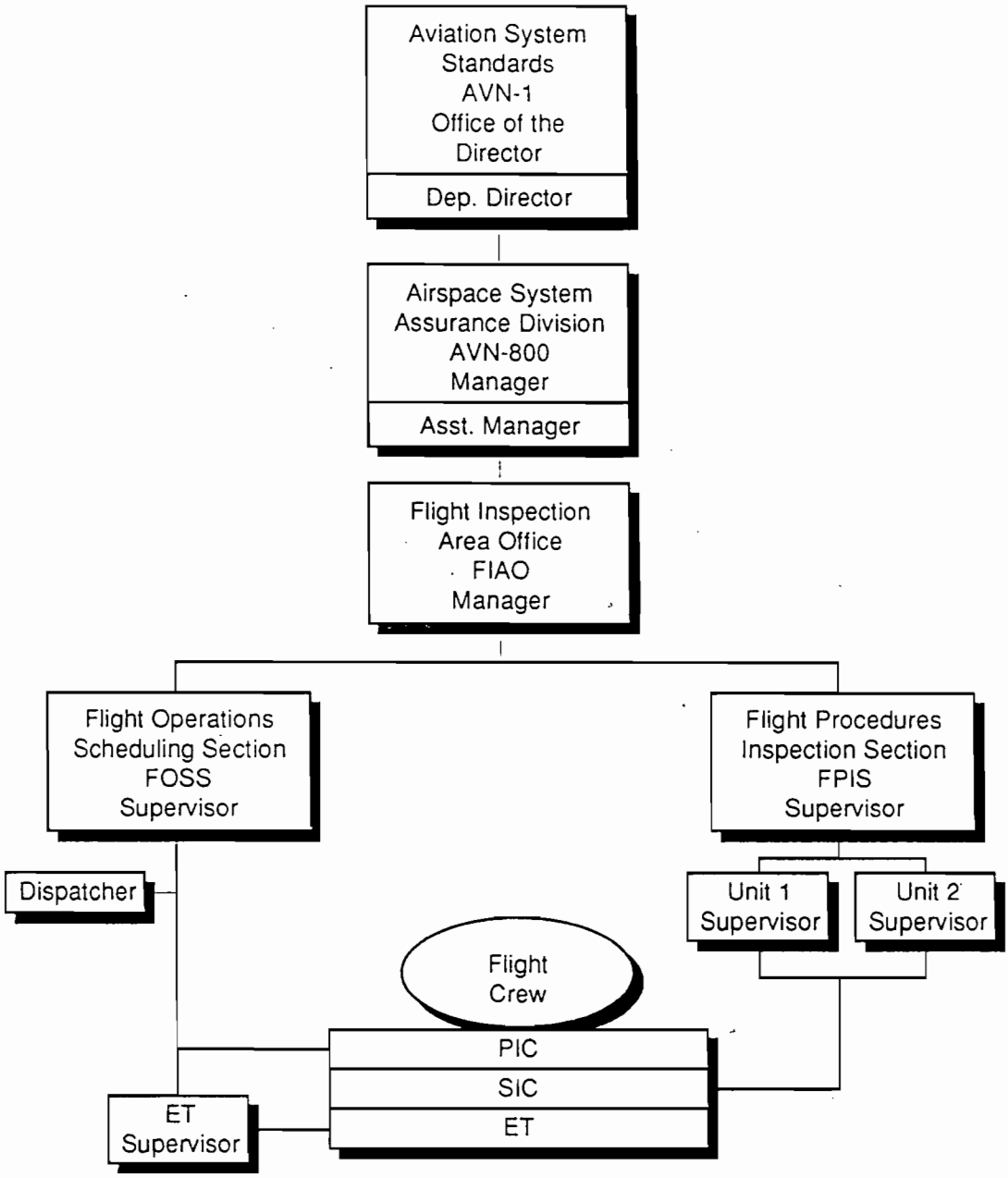

Figure 1.--FIAO organizational structure.

1985 to 1992, he worked at a variety of FIAO and AVN staff positions. In 1992, he was selected as the manager of the ACY FIAO, and served in that position for about 7 months. In 1993, he returned to OKC to fill his current position. As the manager of AVN-800, he was responsible for the "headquarters-level" supervision and oversight of the nine FIAOs operating worldwide.[7]

1.5.7 Director of Aviation System Standards (AVN)

The Director of AVN began his career with the FAA in 1971 in the Flight Standards Division. He held a variety of positions, including operations inspector, aviation safety inspector, and airport certification inspector. He has been in FAA management positions since 1980. He holds an ATP certificate with a variety of ratings. He assumed his position as Director of AVN in 1991.

1.6 Airplane Information

N82, a Beech Super King Air 300/F, serial number FF-17, was one of a group of 19 airplanes produced for the FAA flight inspection mission. The airplane required a specific pilot type rating, although it was similar to the King Air 300 model. The airplane's maximum gross weight limit at takeoff was 14,000 pounds. The usable fuel capacity was 539 gallons. The minimum flightcrew was two pilots. The flight inspection mission required an electronics technician (ET) in the cabin to operate an automated flight facility inspection module. The ET's view looking toward the cockpit area is partially obscured by this module. There were provisions for one spare flightcrew seat in the cabin.

The airplane was powered by two Pratt and Whitney Canada PT-6A-60A engines that produced 1,050 horsepower each, with Hartzell four-bladed propellers.

N82 weighed approximately 12,314 pounds at the time of the accident. The center of gravity was about 187.9 inches, and the limits were from 182.5 to 192.1 inches aft of the datum plane.

The airplane was equipped with pilot and copilot flight director displays that contained electronic attitude director and horizontal situation

[7] The nine FIAOs are Atlantic City, New Jersey; Atlanta, Georgia; Battle Creek, Michigan; Oklahoma City, Oklahoma; Sacramento, California; Honolulu, Hawaii; Anchorage, Alaska; Tokyo, Japan; and Frankfurt, Germany.

indicators. The attitude director indicators provided for selection of a radio altimeter alphanumeric readout of absolute altitude in feet. A single radio altimeter indicator was located on the lower left side of the instrument panel.

The airplane was not equipped with a ground proximity warning system (GPWS). A new FAA regulation, effective April 20, 1994, requires a GPWS on all airplanes operated under the provisions of Title 14 CFR, Part 135. The airplane was equipped with a TCAS (traffic collision avoidance system).

At the time of the accident, the FIAO estimated that N82 had about 200 gallons of Jet A fuel on board, or about 1 hour and 40 minutes of endurance at normal cruising altitude and airspeed.

The airplane's flight log was available in the ACY maintenance area, except for the last page, which was kept aboard the airplane. The inspection of the flight logs and maintenance records did not indicate any deferred maintenance items or other irregularities. All engine, propeller, and airframe inspection cycles and applicable ADs were current with approved directives.

1.7 Meteorological Information

The prevailing weather at the time of the accident was a moist, easterly flow of air over northern Virginia and Maryland with widespread low ceilings, fog, and scattered light rain.

The closest weather observation to the accident site was about 15 miles north at Winchester Regional Airport (W16), Virginia. The weather observations were accomplished by an automated weather observing system (AWOS). Observations for times closest to the accident were:

> Time--1545; 1,900 feet scattered, 2,600 feet broken, 4,000 feet overcast; sensor visibility 10 miles, temperature 61 degrees F, dew point 55 degrees F.
>
> Time--1601; ceiling 1,700 feet broken, 2,700 feet broken, 3,900 feet overcast; sensor visibility 10 miles, temperature 61 degrees F, dew point 55 degrees F.

A National Weather Service in-flight advisory pertinent to the flight of N82 was, in part:

> AIRMET SIERRA - issued October 26, at 0945 for IFR and mountain obscuration valid until October 26, 1600.
>
> AIRMET Instrument Flight Rules - Pennsylvania, New Jersey, Virginia, Maryland, Delaware, District of Columbia and Coastal Waters. Occasional ceilings below 1,000 feet/visibilities below 3 miles in fog/precipitation. Conditions spreading westward across the area...and continuing beyond 1600 through 2200.

1.8 Aids To Navigation

Linden (LDN) VOR was the closest navigational aid to the accident site and was about 5 nautical miles (nmi) southwest of it. There were no reported equipment outages or discrepancies that would have contributed to this accident.

Radar data from the automated radar terminal system (ARTS IIIA) of the IAD terminal radar approach control (TRACON) indicated portions of the flightpath of N82. At 1542, the data indicated that N82 was tracking to the southwest of W16 at an altitude of 1,800 feet msl. The recordings of the target were in segments and consistent with that of airplanes flying below the usable radar capabilities of the system. The Blue Ridge Mountains with elevations to about 2,400 feet msl were situated between the crash site and the radar antenna site. The final recorded radar position of N82 occurred at 1550. The recorded target was approximately 12 nmi southwest of W16 and 3 nmi northeast of the LDN VOR at 1,700 feet msl.

1.9 Communications

There were no reported communications difficulties or outages at IAD around the time of the accident. The IAD approach control communications recordings and transcription concerning the accident contained several unintelligible transmissions that may have been from the accident airplane. The Blue Ridge Mountains were between the crash site and the communications site at IAD.

1.10 Aerodrome Information

The accident occurred about 15 nmi from the Winchester Regional Airport. Although the airport is not equipped with an air traffic control tower, a remote communication outlet (RCO) transmitter/receiver site on the airfield provides direct contact with IAD approach control. The FAA Airport Facilities Directory lists this capability. The RCO allows pilots to file and receive an IFR clearance and to handle other IFR tasks, such as to adjust their release time or cancel a clearance, while on the ground at W16. The flightcrew of the accident airplane was reminded of this facility equipment capability by an IAD approach controller during the approach to the W16. A review of the frequency indicated that the flightcrew of N82 did not attempt to contact IAD approach control through the RCO frequency.

1.11 Flight Recorders

The airplane was neither equipped with a cockpit voice recorder (CVR) or flight data recorder (FDR) nor was it required to be under FAA rules. Other airplane types in the FAA flight inspection fleet are equipped with flight recorders. During the early FAA procurement stages of the King Air 300/F, recorders were included in the specifications. However, during subsequent revisions intended to reduce weight and costs, the requirement for flight recorders was eliminated by the FAA. However, the FAA required similar airplanes, such as the Beech 1900, to be equipped with CVRs for flight when operating in accordance with 14 CFR, Part135, air taxi rules.

1.12 Wreckage and Impact Information

The wreckage was scattered on a north-northeasterly path in descending terrain for a distance of about 1,300 feet. The wreckage was characterized by major fire damage involving the fuselage and powerplants. The initial impact point was in trees on top of a ridge line at around 1,770 feet msl.

Both wings had separated from the fuselage, and both engines had separated from their respective wing attachments. The majority of the aircraft systems, the entire front part of the fuselage, the cockpit area, and the main wing structures were consumed by fire. All of the airplane's flight control surfaces, propellers, engines, and structural components were found at the site. Small

pieces of the aircraft located between the impact point in the trees and the main wreckage area did not have evidence of fire or soot.

The only readable cockpit instrument was the right side barometric altimeter, which indicated 1,900 feet. The engine control stand was sufficiently deformed and melted to preclude any control position determination. The landing gear system components were found in positions consistent with the retracted position. The right flap actuator was found in a position consistent with a flap extension setting of 15 degrees. The engines exhibited counterclockwise torsional deformation and buckling consistent with power delivery at the time of impact or sudden stoppage. The propellers exhibited deformation consistent with high power delivery at the time of sudden stoppage. The initial impact area contained many tree slashes, also consistent with propeller high power rotation.

1.13 Medical and Pathological Information

The Virginia Medical Examiner (ME) reported that the cause of death of the three crewmembers was multiple severe injuries. Although no smoke or soot was found in the respiratory tracts of the crewmembers, their remains were severely burned in the postcrash fire.

During the autopsies conducted by the ME, specimens were collected for toxicological analysis for both the ME and the Armed Forces Institute of Pathology (AFIP). The AFIP reported that the specimens it received for all the crewmembers were negative for alcohol and drugs. However, the ME reported that the blood specimen from the SIC contained 0.04 percent alcohol. Additional SIC specimens from the liver, kidney and blood were sent to an independent laboratory, which reported that the liver and kidney specimens tested negative for alcohol and the blood specimen contained an alcohol concentration of 0.02 percent. The positive blood alcohol results on the SIC are consistent with post-mortem generation from exposure of the body to heat.

The independent laboratory reported that the specimens on the other crewmembers tested negative for alcohol or drugs. Because of the extensive heat damage, the Safety Board did not undertake further blood sample testing.

The FAA Regional Headquarters decided shortly after the accident not to conduct toxicological testing of the controllers or supervisor involved in the handling of the accident airplane.

1.14 Fire

The wreckage site was located a sufficient distance from any road or logging path to preclude fire control or rescue effort. The wreckage was destroyed by a deep-seated, jet fuel-fed ground fire. There was no evidence of fire in flight.

1.15 Survival Aspects

The accident impact was not survivable.

1.16 Tests and Research

None.

1.17 Additional Information

1.17.1 The FAA Flying Program

According to the FAA Aircraft Review, during fiscal year 1993 the FAA flew 49,481 hours in support of the FAA flying program. Of this flight time, 16,408 hours were in rental aircraft, and 2,029 hours were in leased aircraft.

The FAA flying program consisted of five separate organizational users of FAA aircraft at various locations within the FAA organization structure (see figure 2). The flying organizations were:

FIAOs subordinate to the Airspace System Assurance Division (AVN-800), located in Oklahoma City, Oklahoma.

Washington Headquarters Support (AVS-60), located at Washington National Airport, Alexandria, Virginia.

Regional Support Programs located in nine areas, responsible to the individual Regional Flight Standards Division Managers, who report to the Director, Flight Standards Service, AFS.

The Technical Center (ACN-700), located in Atlantic City, New Jersey.

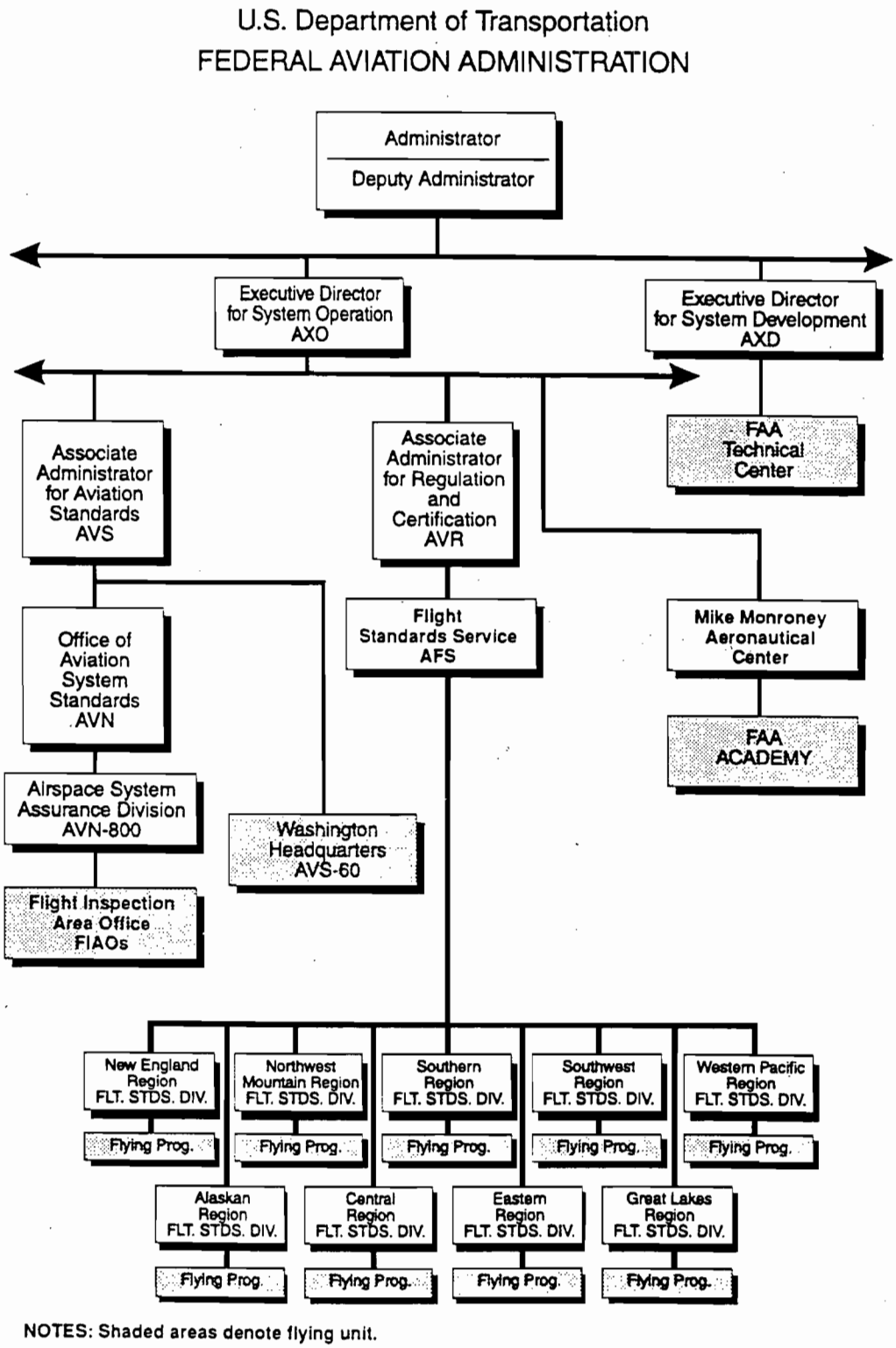

Figure 2.--Operating units of the FAA flying program.

The FAA Academy (AMA-200), located at Oklahoma City, Oklahoma.

The FAA owned 53 aircraft in 1993 of 13 different types. They also rented several different airplanes and helicopters. This fleet size is comparable to the commercial air transport operations of Skywest Airlines or Henson Airlines.

1.17.2 Aviation System Standards Organization and Information

The duties and responsibilities of AVN are listed in FAA publications as follows: Manages the agency aircraft program; administers flight inspection, procedures, and fleet maintenance programs; provides regulatory support; and administers the registry of civil aircraft and airman records programs. Flying activity within the direct line authority of AVN is conducted by nine subordinate FIAOs performing flight inspection missions (see figure 3).

1.17.2.1 Flight Inspection Area Office (FIAO)

The organization of the ACY FIAO was representative of the five FIAOs in the continental U.S. The office was headed by a manager whose responsibilities include the management and evaluation of the FIAO program. The position description does not require pilot operational experience or currency. The manager was responsible for the FIAO flight safety program and accomplished this through the designation of an additional duty unit flight safety officer (FSO).

An assistant manager position was identified for the FIAO, but was not funded. The Safety Board learned that some of these positions have been filled on a temporary basis by persons without pilot operational experience.

The manager of the ACY FIAO had been assigned to the office approximately 7 months before the accident. During this time, he stated that he had not yet reviewed the pilot personnel records and that he was not aware of any SIC or ET complaints about this PIC. He was vaguely aware of the previous reprimand given to the PIC before the manager's assignment. He had not been informed of the October 1993 incident of flying below the glidepath in IMC until after the accident, when he was interviewed by Safety Board investigators. He stated that he conducted weekly meetings with all FIAO supervisors. He further stated that he "did not wish to micromanage."

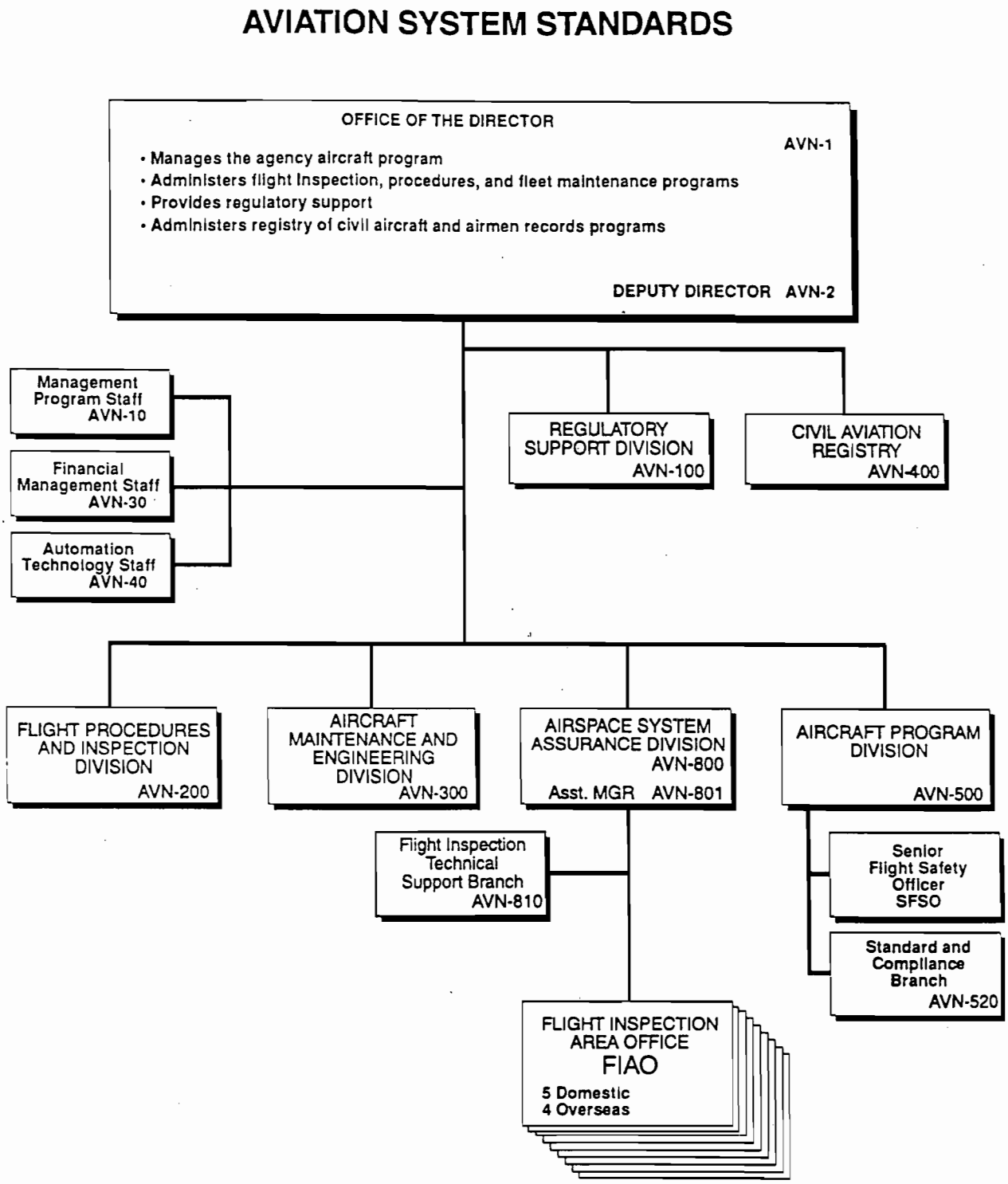

Figure 3.--Organizational structure of Aviation System Standards (AVN).

The FIAO was divided into two sections. The Flight Operations/Scheduling Section contained the PICs and the ETs. The section was supervised by the FO/SS. He managed the PICs and a unit supervisor who managed the ETs.

The other FIAO section was the Flight Procedures/Inspection Section. This section contained procedures-development personnel, whose primary duty is the design and redesign of instrument procedures. These personnel perform the SIC duties for the FIAO mission.

The ACY FIAO was authorized and staffed with six funded PIC positions. The principal duty of the PIC was to fly the flight facilities inspection missions. However, PIC positions were GM-14 grade with management responsibilities. In addition to flying, item number three of the PIC's position description required that he recommend selection of pilots for upgrading, and evaluate performance and recommend disciplinary action of SICs. The PIC was required to write an end-of-the-week evaluation of SIC's performance.

PICs normally flew 2 out of 4 weeks, and accumulated approximately 600 hours of flight time annually. Preparation and planning for the missions, the conduct of the missions, and postmission paper work involved 90 percent of the PIC's duty time. Ten percent of the PIC's time was allocated to additional duties.

At the time of the accident, the ACY FIAO was authorized 20 Procedures/SIC positions. Eleven of those positions were funded. The mission schedule required the SIC to fly 1 week out of 4 and accumulate 200 to 225 flight hours a year. The majority of the SIC duty days were spent in the design and review of published instrument procedures. Flying duties appeared as the last item on the job description and involved about 15 percent of the SIC's duty time.

The normal work program for the FIAO was to schedule three of the four airplanes each week to support inspection missions. The FO/SS received the facilities inspection requirements from AVN. The FO/SS established the mission schedule, assigned PICs, and requested SICs from the available pool in the procedures section.

A flight safety officer (FSO) position was identified in each FIAO. In the ranking of organizational positions, the FSO was listed fourth, behind the

manager, assistant manager, and the FO/SS. Duties and responsibilities were established in AVN operating directives. The FSO performed this assignment in the 10 percent of his duty time allotted for additional duty work. During this assignment, the FSO was supposed to continue the FSO tasks through his normal line supervisor rather than through the FIAO manager.

The FIAO manager stated that the ACY safety program was "average to above average." He stated that the FSO position is an additional duty assigned to a SIC or PIC. He also stated that he believed the FSO duties can reasonably be accomplished in the 10 percent of duty time allotted to the additional duties. He said that the FSO assignment was treated as any other additional duty, such as the training officer or ATC liaison officer.

The FSO at ACY said that he had been assigned this duty about 1 month prior to the accident. He stated that he had taken a correspondence course a few years ago while he was in the National Guard, but that he had not attended formal or resident safety schools.

Safety Board investigators interviewed more than one-half of the FIAO employees. In general, the ACY pilot staff stated that they believed the local flight safety program was intended to simply "fill a square." They said that informative meetings were not conducted and that incident reporting and evaluation were not entertained. They added that ACY management emphasis was on the "mission priority."

1.17.2.2 Airspace System Assurance Division (AVN-800)

The manager of the Aerospace System Assurance Division was responsible for operational control and conduct of AVN flight procedures and flight inspection missions carried out in the nine FIAOs. Within AVN-800, there exists a Flight Inspection Technical Support Branch (AVN-810) to provide oversight of flightcrew performance. It should be noted that a Standards and Compliance Branch (AVN-520) inspects for the entire FAA flying program's compliance with operations, maintenance and training directives, which are described in paragraph 1.17.2.5.

1.17.2.3 Flight Inspection Technical Support Branch (AVN-810)

The AVN-810 branch ensures that flight inspection activities comply with FAA policies and directives. Personnel in AVN-810 conduct the in-flight evaluation of FIAO flightcrews and provide evaluations of inspection missions and pilot performance.

The manager of AVN-810 was appointed to his current position in January 1993. Before that time, he had served as a technician, an ET supervisor and as the manager, Policy and Standards (AVN-550), and acting ACY FIAO manager. He does not possess any pilot ratings.

There are four inspection pilots assigned to AVN-810. These pilots are designated as check airmen by AVN-800. There is no formal published training program for qualifying the check airmen at OKC or in the individual FIAO's. The Practical Flight Test Standards used for an ATP certificate are used as a guide for the flight evaluation. AVN-810 is responsible for administering the standardization and evaluation of Flight Inspection Program personnel only. AVN-810 does not oversee the standardization of the other four FAA flying programs.

AVN-810 check airmen administer check flights to selected FIAO supervisory pilots who then administer required evaluations at the FIAO level.

The AVN-810 guideline is to conduct a review of each FIAO every 18 months. AVN-810 also serves as a team member during technical audits of FIAO organizations, as conducted by AVN-520. During unit reviews and audits, the AVN-810 staff evaluate selected FIAO flight inspection missions. However, AVN-810 does not maintain central standardization records or make an overall AVN organizational evaluation.

1.17.2.4 Aircraft Programs Division (AVN-500)

This division is responsible for developing policy governing operation and maintenance of all FAA aircraft by developing programs and fleet requirements. The division contains the FAA flight safety program administered by the senior flight safety officer (SFSO). The Standards and Compliance Branch (AVN-520), which is subordinate to the division, provides oversight of all operating units of the entire FAA flying program.

1.17.2.5 Standards and Compliance Branch (AVN-520)

AVN-520 was created as a result of a recommendation made in the 1989 System Safety Survey Review. The survey recommended that a position be established to oversee standardization/evaluation of the entire FAA flight program from the AVN director's level. As indicated above, AVN-520 is subordinate to the Manager, Aircraft Programs Division (AVN-500), who, in turn, reports to the Director of AVN. The unit does not maintain a central repository of training or operations records for evaluation. It inspects the unit's activities and records for compliance with existing directives.

AVN-520 conducts technical audits of all the FAA flying programs. The audits are intended to inspect records and reports in the areas of maintenance, operation, and training.

Audits of all organizations that participate in the FAA flight program are scheduled to be conducted on a triennial basis. The ACY FIAO received a "satisfactory" audit from AVN-520 in 1993.

The manager of AVN-520 has been a flight instructor, FAR Part 135 operator, and check airman. He possesses an ATP certificate and has accumulated about 11,000 flight hours. In 1984, he was employed by the FAA in Flight Standards, and he transferred to AVN in 1992.

As previously noted, the evaluation of flightcrew performance is not a function of AVN-520. Flight standardization for the FIAOs is a function of AVN-810. The other FAA flight programs are responsible for their own standardization programs.

1.17.2.6 Senior Flight Safety Officer (SFSO)

The SFSO position was created in 1990 as a result of a recommendation made in the 1989 System Safety Survey. The survey recommended that a position be established for the safety program at the AVN director's level. The SFSO was ultimately assigned to the Aircraft Programs Division (AVN-500) and reports to the division manager, who, in turn, reports to the Director of AVN.

The Director of AVN is responsible for the management and operation of the complete FAA flying program. The SFSO, in the performance of her duties and responsibilities, is the SFSO of the five FAA flight safety programs. These include Flight Inspection (AVN-800), the FAA Academy (AMA-200), the FAA Technical Center (ACN-700), the Washington D.C. Headquarters (AVS-60), and the nine FAA regional flight programs.

In this position, the SFSO oversees a safety program that spans the authority of two executive directors for the FAA Administrator, three associate administrators, nine regional division managers, numerous office/branch managers, and includes over 100 FSOs.

In June 1993, the SFSO coordinated and conducted the first planning conference with all of the FAA aircraft program users. During this meeting, goals and objectives of the safety program were established. Representatives of all FAA flight programs were invited to attend.

The SFSO developed two documents as the basis for the FAA flight safety program. The "Program Strategic Plan" established the goals and objectives, programs, committees and assignments for the safety program. Included were milestones and a schedule for implementation or completion. The "Program Strategic Plan Milestones" established a schedule for programmed events though fiscal year 1996. The program has yet to be initiated.

When she was asked about the AVN crew resource management (CRM) program, the SFSO stated that the program was "still in the initial development stage."

The SFSO has employment experience with a FAR Part 135 operator, and she has been a certified flight instructor. She started FAA employment as a Flight Standards Operations Inspector. She possesses an ATP certificate and has accumulated approximately 10,000 flight hours. She had been assigned as the AVN SFSO for about 1 year at the time of the accident. Her safety background included an assignment as the Western Regional Safety Specialist, attendance at the University of Southern California's Flight Safety Officer's Course, and the Navy Commander's School for Safety.

The SFSO stated that she was often "left out of the loop with management regarding safety." She said that operational decisions were often

made without flight safety office involvement and that the degree of support for field FSOs varied by location.

The SFSO said that she had completed 10 site visits to FAA field offices in the past year, including the ACY FIAO. She stated that her visits to the flying units revealed that not all of the program requirements were being accomplished in the field. She said that all incidents in FIAOs that occur in the field should be reported to her office. She also said that anything presented as a potential safety hazard must be reported. During the past 12 months there were about 20 incident reports submitted by FIAOs, many of which related to the King Air landing gear struts. The investigation revealed that many incidents and safety hazards were not reported and further that the SFSO was not informed, involved, or consulted in the incident report process.

The January/February 1994 issue of AVN's *FOCUS* stated that the "Gateway to Quality" program "received about 30 suggestions in 1993." In that program, the Director "determines what is required on each recommendation and forwards it to the appropriate organization for action. The name of recommending employee is removed first." However, investigators learned that the program did not have guarantees against reprisals for employees who brought safety-related concerns to the attention of management.

Investigators learned that the Deputy Director of AVN issued instructions that prevented the SFSO from participating in the investigation of this accident.

1.17.3 Federal Aviation Regulation Compliance

Public use aircraft, such as those in the FAA flying program, have historically presented special challenges to fleet managers regarding compliance with the FARs. For example, an FAA internal memorandum, dated September 1984, stated:

> Should an incident occur, the only portions of the FAR's that shall be enforced by GADO (General Aviation District Office, now FSDO [Flight Standards District Office]) personnel are those portions of FAR 91 that regulate air traffic, air space restrictions and aircraft registration. Any other violation uncovered shall be

> handled by internal disciplinary action taken by the supervisor. This would include violations such as expired medical certificates.

However, by August 1989 the policy had changed. The manager of the Fleet Management Branch, AVN-510, stated:

> The FAA does require its pilots and flight crewmembers to hold appropriate U.S. Airman Certificates and therefore, agency pilots are subject to reexamination under Section 609 of the Act for reasons of competency. These are the views and understanding of Section 609 of the Act from the Office of Flight Standards in Washington Headquarters.

A memorandum from the Manager, Flight Procedures and Inspections Division, AVN-200 (now AVN 800), was issued in September 1989 and reiterated that "agency pilots are subject to reexamination under Section 609 of the Act for reasons of competency."

At the completion of the System Safety Survey in 1989,[8] there was a general movement within the FAA flying program to comply with the regulations applicable to commuter operators and air carriers. FAA Orders stated that Parts 121 and 135 of the FARs would be used as a framework for the development of management, operating, training, and maintenance procedures.

In November 1990, FAA Notice 4040.36 was published. It referred to FAA aircraft and stated, "...All aircraft will be operated and maintained in compliance with those Federal Aviation Regulations (FAR) that ensure a level of safety equivalent to the aviation industry."

The Notice further stated, "...the FAA shall utilize Parts 91, 121, and 135 of the FAR to govern its flight operations. This should not be construed to mean that total compliance with all of the air carrier rules is necessary." The notice also stated that manuals would be developed for operations, training and maintenance for the five FAA flying programs, and that Parts 121 and 135 would be used as a framework for developing these procedures.

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[8] See section 1.17.6.4 for information on the System Safety Survey.

In December 1990, AVN-2 sent a letter to the Director of Flight Standards Service (AFS-1) stating that the Associate Administrator for Aviation Standards had adopted the recommendation of the 1989 System Safety Survey to establish a joint AVN/AFS team to:

> ...(1) conduct a review of regulations to determine the extent to which various flight programs will comply with Federal Aviation Regulations and (2) to work with the flight program elements in certifying that various manuals and training programs meet regulatory requirements.

In January 1991, AFS responded to this request in a letter which appointed the manager of the Flight Standards Division (ASW-200) to assist AVN in establishing an AVN/AFS certification team. The team was responsible for certifying the FAA flying programs through a review of the FARs to determine the applicability and compliance levels; and working with FAA flight program elements to certify the various manuals and training programs.

FAA Order 4040.23, dated November 25, 1991, signed by AVN-1, was published to establish the FAA procedures for determining the level of compliance with the FAR under the FAA's Aircraft Management Program (see appendix B). This document set a different tone for compliance. It established the Director of AVN as responsible for the management and operations of the FAA aircraft. Paragraph four stated, "The FAA aircraft shall be certified, operated and maintained in accordance with the FAR." However, the next sentence stated, "The determination of applicable regulations shall be made by the Director of AVN." The Order also stated that representatives of AVN and AFS would assist each FAA program activity in developing the respective manuals. In addition, it stated, "Final determination and acceptability of the manuals and subsequent revisions shall be made by the Director of AVN. Manuals shall be coordinated with Flight Standards Service prior to implementation."

Investigators learned that some midlevel managers believed that AVN must retain in-house final approval authority for their procedures and manuals based on overall "mission requirements." Several managers stated that it was their desire to avoid Flight Standards oversight and that they were "intimidated" by the possibility of Flight Standards ramp checks, proficiency examinations, and enforcement action.

1.17.4 Certificate Management Office (CMO) Oversight

In June 1991, the FAA CMO, located in Dallas/Ft. Worth (DFW), Texas, was designated by AFS to oversee the FAA flying program as managed by AVN. A principal operation inspector (POI), principal maintenance inspector (PMI), and a principal avionics inspector (PAI) were assigned to the AVN flying program, and they began negotiations for the "oversight" role.

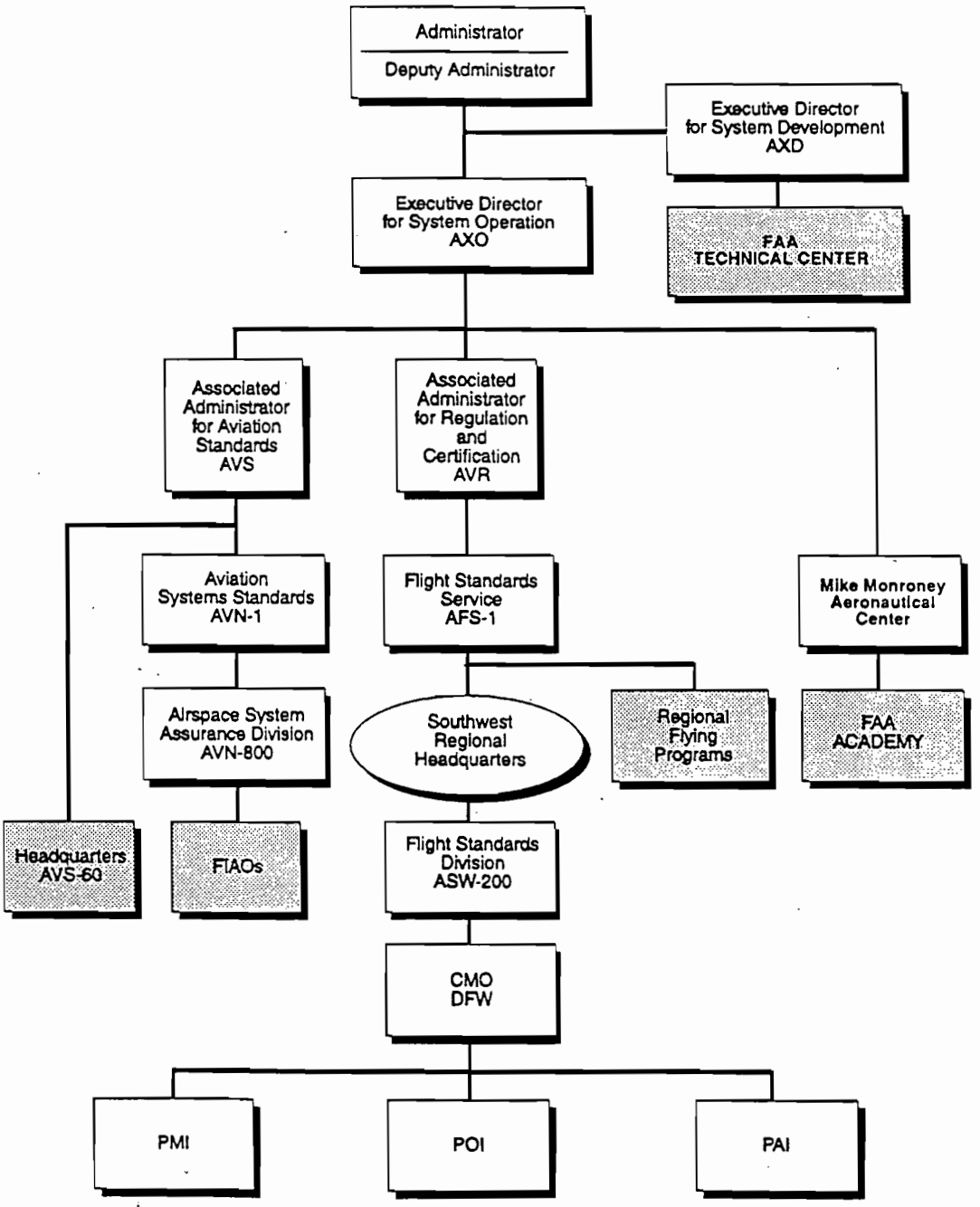
The CMO at DFW was selected to oversee AVN management of the FAA flying program due to their experience with operators covering a wide geographical area, such as AVN and their proximity to the AVN Headquarters in OKC. Sufficient personnel were available in the DFW office to accomplish the mission.

The CMO has an established chain of command reporting through the DFW Flight Standards Division, through the Director of Flight Standards Service (AFS), to the Associate Administrator for Regulations and Certification (AVR).

The Office of Aviation System Standards (AVN) reports to the Associate Administrator for Aviation Standards (AVS). The Associate Administrators (AVS and AVR) report to the Executive Director for System Operation (AXO). This is the lowest level on the organizational chart where the executives of the operating unit and the oversight unit fall under a common supervisor (see figure 4).

The investigation revealed that at the time of the accident, neither FAR Parts 135 or 121 operations specifications had been issued for any of the AVN operations. Manuals were in various stages of development and implementation. However, none of the manuals had been "approved" by the CMO. Instead, there was an accommodation to allow AVN to "coordinate" the acceptance of manuals with the CMO.

The Required National Flight Standards Program Work Function, N1800.132, provided guidance to the Flight Standards field offices for development and execution of the annual National Work Program Guidelines (NWP). This document identified the required work functions ("R" items) that were specific inspections that needed to be accomplished, and made up the basic inspection program at each FSDO. Planned inspections ("P" items) were the discretionary work functions that regions, district offices and principals determined



NOTES: Shaded areas denote flying unit.

Figure 4.--Organizational structure for CMO oversight.

to be important (work schedule permitting), but they were not required to be accomplished.

The DFW CMO removed the "R" items from the computer printout for fiscal year 1994. The inspections were retained as "planned only" items for three reasons: the FIAOs were "public-use" rather than 135 operators; the FIAOs did not have an approved check airmen qualification program; and the FIAO check airmen were designated internally within their own organization rather than certified by an FSDO inspector.

During Safety Board interviews at the CMO, personnel indicated that "if a review of the 1989 survey was accomplished at this time, we might find some similarities in the findings. But, due to changes in AVN, there is improvement." The personnel also believed that the AVN internal audit program was still developing and improving.

The POI stated that, in summary, he and the principal inspectors have a basis to conduct inspections and evaluations of Part 135 commercial operators utilizing the Inspector's Handbook. Since AVN does not possess the equivalent of an operating certificate, does not comply with certain FARs, and does not have operations specifications, the situation presents a problem of how to enforce rules on AVN flying activities.

When the POI was asked how the situation of AVN oversight was being communicated to his superiors, he produced a CMO memorandum, dated October 22,1993, just 4 days before the accident, addressed to the Director, Flight Standards Service, which presented the status on seven key issues (see appendix E for complete text). A summary of the topics and their status follows:

a. Self audit program - canceled for CY1993 by AVN,

b. Training program - awaiting flight training video,

c. Response to PTRS [program tracking and reporting system] inspections - AVN opposed to feedback loop,

d. Icing policy - AVN will comply with Part 135, rather than Part 121,

e. Overhaul extension - authorized without engineering authority,

f. Regulatory review - still negotiating with AVN,

g. Surveillance - one FIAO still thought compliance was optional.

1.17.5 Previous AVN Accidents

The FIAO mission experienced two previous major airplane accidents in the past decade. A Rockwell Sabreliner (NA-265) executive jet operated by the OKC FIAO was destroyed in a nonfatal accident in Liberal, Kansas, on September 29, 1986. The accident occurrence was described as "gear collapsed, landing - flare/touchdown." The Safety Board determined that the probable causes of the accident were "procedures/directives - not followed - pilot-in command, and gear retraction - inadvertent - copilot." (See appendix C).

The Safety Board did not make recommendations as a result of this accident. FAA AVN personnel undertook improvements in maintenance procurement and parts inventory control. There was no evidence that changes were undertaken in the area of flight operations.

A Rockwell Jet Commander (1121A), operated by the ACY FIAO, was destroyed near Oak Grove, Pennsylvania, on November 2, 1988. Three flight crewmembers received fatal injuries. The accident occurrence was described as "in-flight encounter with weather, cruise - holding (IFR)." The Safety Board determined that the probable causes of the accident were "ice/frost removal from aircraft - delayed - pilot in command, and compressor, assembly blade - foreign object damage." (See appendix C).

Flightcrew use of alcohol was a "factor" in that accident. Shortly after the accident, and well before the Safety Board's determination of probable cause, the FAA commissioned a Flight Standards Service team to undertake a system safety study of the AVN flying operation. The FAA review resulted in numerous recommendations and suggestions for reorganization (see sections 1.17.6.4 and 1.17.6.5).

1.17.6 AVN Reorganization Studies

The FAA flight facilities inspection mission has been the subject of several management efficiency studies for almost a decade. These studies/surveys/reviews are noted here to better understand the organizational structure of the FAA flying program at the time of the accident.

1.17.6.1 Arthur Young Management Efficiency Study

In December 1985, the FAA Office of Aviation Policy and Plans contracted with the Arthur Young group for a Management Efficiency Study of the Flight Inspection Program. The review concentrated on the operations functions of the flight inspection mission. At the time of the study, facility inspections were carried out by professional flightcrews who were supported by nonflying employees in a Procedures Section that developed and/or revised the instrument procedures. The study found "excess idle time" for the flightcrews and recommended a new organizational structure combining the flight inspection and procedures sections to enhance the cross utilization of personnel.

There was no immediate action taken as a result of the Arthur Young Study. One year later, the FAA conducted an internal study of the Flight Inspection Program, entitled the "Concept of the 90's."

1.17.6.2 Concept of the 90's

In 1986, an internal study of the Flight Inspection Program was initiated taking into consideration the Arthur Young Management Efficiency Study. The study, "FAA Flight Inspection and Procedures Operational Concepts Through the 1990's," was intended to provide recommendations that would enable the Aviation System Standards National Field Office (AVN) management to determine strategies to employ for the Flight Inspection Program through the year 2000.

This study also suggested combining the flight inspection and procedures functions. It was proposed that each FIAO should establish three identical sections with procedures-trained pilots, each with a unit supervisor to manage a smaller group of employees. The Concept of the 90's called for eliminating the ground-based procedures specialist and incorporating the procedures function into the pilots' positions, both PIC and SIC.

This proposal was implemented on a provisional basis only in the Battle Creek, Michigan, FIAO.

1.17.6.3 Concept of the 90's White Paper

In December 1987, at the request of the Director of AVN, the Manager of the Aircraft and Fiscal Programs Division (AVN-40), completed a white paper entitled, "Preliminary Analysis of Concept of the 90's." The paper recognized the previous attempts to improve productivity and stated:

> The Arthur Young recommendation involved flight inspection flight crewmembers being assigned regular duties and activities to support the FIFO's[9] procedures sections. However, in the "Concept of the 90's" organization, the recommendation of Arthur Young was not adopted, and instead, we find a radical departure from previously tried alternatives.
>
> [The study] eliminates the job function/description of copilots. This could present an embarrassing situation to the aviation industry if the U.S. regulatory agency were to eliminate a total category of airmen from its rolls.
>
> Based on the documentation provided to this office, we cannot support the reorganization. AVN program justification and budget posture would be weakened to a point that competition for agency resources would be jeopardized.

As a result of this white paper, AVN implemented an alternative and unique FIAO organizational structure, which existed at the time of the accident (see figure 1).

1.17.6.4 1989 System Safety Survey

After November 1988, following a fatal accident involving an FAA-operated Jet Commander at Oak Grove, Pennsylvania, the FAA initiated an internal inspection of its flying program. In January 1989, the Associate Administrator for Aviation Standards, AVS-1, directed that a System Safety

[9] (FIFO) Flight Inspection Field Office, renamed Flight Inspection Area Office (FIAO).

Survey be conducted by AFS staff. A team of 17 FAA inspectors using contractor support, conducted the survey in two phases, the first phase dealt with the FAA flight facilities inspection program as managed by AVN. The other phase evaluated the operational aspects, policies, and procedures employed in the remainder of the FAA flying program.

Of a total of 409 findings of the survey, 159 findings were identified as "safety or regulatory non-compliance." The survey stated that some findings and recommendations were based on the premise that the FARs were to be followed. This was based on FAA Order 4040.9C which stated "Aircraft operated by the agency are public aircraft and, as such, are not subject to the FARs....However, it is policy that agency aircraft will be...certified, operated and maintained in accordance with the FAR...."

The survey identified problems that could be grouped into a few specific areas. The survey found, "The AVN organization is not following its own guidance for the establishment and conduct of a viable safety program." A recommendation was made that two direct reporting staffs, evaluation/standardization and safety, be established under the Deputy Director (AVN-2).

There was an initial move to establish a safety officer position and a Standardization/Evaluation Branch in the office of the Director of AVN. However, through later staff actions these positions were established within the Aircraft Programs Division (AVN-500). As of the date of the accident at Front Royal, the SFSO position and the Aircraft Programs Standards Branch were under the jurisdiction of the Aircraft Programs Division, AVN-500, located in OKC.

Another recommendation from the study concerned compliance with the FARs. This recommendation was based on the finding that although the FAA Order 4040.9C called for compliance with specific sections of the FARs, there were inconsistencies in the way AVN applied the policy.

The action to satisfy the survey recommendation called for FAR compliance; however, AVN did not indicate total compliance. As stated earlier, FAA Order 4040.23, dated November 25, 1991, stated, in part: "...The FAA aircraft shall be certificated, operated, and maintained in accordance with the FAR. The determination of applicable regulations shall be made by the Director of AVN."

Another recommendation from the study urged that a training position be established in each FIFO. In response, AVN assigned the training duties to the existing FO/SS and to the maintenance supervisor positions.

The study also recommended ensuring that long-range corrective action was implemented, by compiling teams of qualified Flight Standards inspectors to assist AVN in the development of new manuals, minimum equipment lists, directives, and procedures. This was to be accomplished under a phased time schedule. The FAA published Notice 4040.36, which called for separate operations and training manuals for each of the five FAA flight programs. Additionally, a General Maintenance Manual (GMM) was to be published to cover all of the FAA programs.

At the time of the Front Royal accident, a GMM had been published, approved, and implemented by AVN, but it had not been approved by the Certificate Management Office. Of the five operations manuals, three had been implemented but not approved by the CMO; and of the five training programs for each FAA program, none had been implemented.

1.17.6.5 1990 AVN System Safety Survey Review

In November 1990, the Director of AVN requested that a follow-up review be conducted of the 1989 System Safety Survey. This review found several instances in which AVN had considered the survey's findings to have been completed; however, the corrective actions were still in a draft or proposal form. The review stated that no interim guidance or actual changes to FAA Orders had been promulgated to the FIAOs. The review also found that safety and standardization/check airman programs had not been established, and a policy to implement the FARs had not been accomplished.

In its conclusion, the report stated that the actual implementation of the survey's recommendations had been slow due to "various problems including a lack of resources, reluctance to change, lack of interim guidance to the field, and the magnitude of the findings and recommendations."

1.17.7 Postaccident Safety Board Recommendations

During the field investigation of the accident, Safety Board operations and human performance investigators conducted interviews at the Atlantic City

FIAO, and then at the FAA Flight Standards CMO in Dallas, Texas, and at the unit headquarters, AVN, Oklahoma City, Oklahoma.

The Safety Board's investigation found that in November 1990, AVN had issued FAA Notice 4040.36, which directed that FAA aircraft would be operated and maintained in compliance with applicable FARs to ensure a level of safety equivalent to that of the aviation industry. The notice also directed that FAA aircraft "shall be operated in compliance with Parts 91, 121 and 135 of the FAR."

Interviews with the CMO found that operations specifications had not been published for FAA flying activities. An implementation schedule for oversight had not been established by AVN, AFS, or other senior FAA authorities. A positive method to resolve deficiencies or enforcement/disciplinary action suitable to AFS was not in place. Required National Flight Standards Program Work Functions (FAA Order 1800.132) activity, in accordance with required surveillance in the Program Tracking and Reporting System for a Part 135 commercial operator, was not established for FAA flying activity. Traditional surveillance by Flight Standards field office inspectors did not exist at the time of the accident.

Investigators found that at the ACY FIAO, the FO/SS resolved complaints and grievances as part of his responsibilities for effective operations, standardization, and regulatory compliance. Investigators learned of numerous deficiencies that were brought to the attention of the FO/SS; however, these issues and complaints were reportedly not resolved or brought to the attention of the FIAO manager. Some pilots believed that conflicts between flight crewmembers resulted in preferential scheduling by the FO/SS. Investigators found that 8 out of 11 SICs avoided flying with the PIC. Complaints about this pilot had begun when he was selected as a PIC. More complaints were communicated to FIAO management about this PIC than any other flight crewmember in the unit. Crewmembers told Safety Board investigators that a lack of action by the FO/SS or the FIAO manager discouraged flight crewmembers from expressing further concerns or complaints about the PIC or from reporting all incidents that involved him.

Investigators were told by unit pilots that the FIAO organizational structure provided an atmosphere that resulted in a breakdown of the professional flightcrew concept. A SIC supervisor stated that when the current organization

was put in place, it immediately became, "us and them, PIC versus SIC," due to different supervisor inputs. Investigators learned that the SIC, by virtue of the job description and responsibilities, was a secondary participant in the FIAO flight mission. Flight assignments for SICs were normally spaced 4 to 5 weeks apart. SIC flight time was about 1/3 of that accomplished by the PICs. The PIC role functioned at unit level, to extend well past the flight operation and into administrative supervision, including appraisals, promotions, upgrade potential, and reassignments.

During FIAO interviews, one unit supervisor told Safety Board investigators that, "Crew resource management (CRM) is nonexistent." The FIAO manager said that although CRM training had been initiated at some time in the past, lack of funding caused it to be incomplete. He stated that there was no active CRM program at the FIAO. When the AVN staff was queried about CRM, investigators were told that a program that would be suitable to the needs of the FIAO mission was still in the early stages of its development.

During an interview with the news media, the FIAO manager said that he believed a ground proximity warning system (GPWS) would not be appropriate for the mission. He stated that the aural signal would actuate during the typical maneuvers that are required for facilities inspections and that the warning would become a nuisance and a distraction to the pilots.

Preliminary investigative findings indicated that although there were many elements of change within AVN, some of the negative management and organizational flight safety observations identified in the 1989 System Safety Survey were still present at the time of the accident on October 26, 1993. Shortcomings were acknowledged by AVN upon receipt of the survey; however, sufficient and timely corrective actions were not implemented.

The Safety Board was concerned that the basic elements of flight operations and flight safety management that the FAA expected of air carrier and commuter operators were not established in FIAO flight operations. The Safety Board was further concerned that these same basic elements of flight operations safety management were not present in the other elements of the FAA flying program; that is, in the regional and Headquarters units, the Technical Center and the Academy. The Safety Board believed that timely corrective actions were necessary to ensure that all flying missions of AVN operated at a level of safety equivalent to that of the aviation industry.

Therefore, as a result of concerns originating from the events surrounding its investigation of this accident, on November 24, 1993, the Safety Board issued one Urgent Action recommendation and seven Priority Action recommendations to the FAA (see appendix D). The FAA Administrator replied to these recommendations on January 31, 1994. A copy of the response is included in this report (see appendix D). The Safety Board has classified the responses to its safety recommendations as follows:

Recommendation	Action	Classification
A-93-161	Closed	Acceptable Action
A-93-162	Open	Acceptable Response
A-93-163	Open	Acceptable Response
A-93-164	Open	Acceptable Response
A-93-165	Open	Acceptable Response
A-93-166	Closed	Acceptable Response/Superseded
A-93-167	Closed	Acceptable Action
A-93-168	Open	Acceptable Response

1.17.8 Labor Union (PASS) Contribution

The Professional Airways Systems Specialists (PASS) was the union recognized as the bargaining unit for SIC and ET flight crewmembers in the FIAOs, but it did not represent the PIC group. PASS representatives participated in the investigation. They related that their organization was not currently organized with standing committees to address professional standards of their pilot members or flight safety issues. They considered that each issue would be handled on its own merit.

1.17.9 FAA DUI Medical Certification Review

The FAA's Civil Aeronautical Medical Institute (CAMI) maintains airman medical records regardless of the airman's type of employment. Records of pilots who work for the FAA or other government agencies are maintained the same as those for commercial or private pilots.

Persons who hold an airman medical certificate must submit a written report of each motor vehicle DUI conviction or motor vehicle license revocation

related to DUI to the FAA within 60 days of the legal action (FAR 61.15(e)). Also, each person who applies for a medical certificate signs an express consent form authorizing the FAA to access the National Driver Register (NDR) (FAR 67.3). CAMI compares NDR information and the airman submissions related to offenses involving alcohol or drugs to evaluate whether a medical certificate should be denied, suspended or revoked.

Federal regulations and CAMI policy require a redetermination of an individual's ability to meet airman medical standards for persons who, at a minimum, have received two DUI convictions in a 3-year period, or three or more DUI offenses at any time. Persons are required to submit to CAMI the following information: drivers' records from the state or states maintaining the records, descriptions of the circumstances surrounding the offenses, records of any treatment for alcohol, drug use or related disorders, and a total alcohol assessment from a substance abuse specialist.

In early 1989, CAMI requested specific information from the PIC related to his failure to report a 1987 DUI conviction. In a followup review, CAMI reaffirmed the PIC's first class medical certification based on his application dated September 12, 1988.

A CAMI review of the PIC's March 18, 1991, medical application noted a record of two alcohol-related offenses. CAMI requested the PIC's records and descriptions of the offenses, a copy of his current driving record, and a "total alcohol assessment" from a substance abuse specialist. The PIC complied with CAMI's request by submitting an evaluation letter from the specialist, who was a licensed physician (osteopathy) and a former aviation medical examiner. Based solely on his interview with the PIC, the specialist stated that he did not consider the PIC to be dependent on alcohol or drugs. The letter was sufficient for CAMI to reaffirm the PIC's eligibility for first class medical certification based on a medical certification application dated September 26, 1991.

CAMI policy required it to interact directly with applicants for the airman medical certificate rather than with the employers of the airmen. Consequently, the supervisor of the PIC and AVN management were unaware of the correspondence between CAMI and the PIC, of the DUI convictions, that an evaluation by a substance abuse specialist was required, or that the evaluation had taken place.

2. ANALYSIS

2.1 General

The investigation found that the flightcrew was trained, certificated, and qualified in accordance with applicable FARs and operator requirements. The pilots were considered to be in good health and held the proper FAA medical certification. The electronics technician was not involved in the operation of the airplane.

The airplane was maintained in accordance with applicable unit maintenance procedures and FARs. Examination of the airplane's structure, flight controls, powerplants, and propellers disclosed no evidence of a malfunction. The airplane's navigational equipment was severely damaged by impact and fire and could not be tested. However, the flightcrew was operating under VFR, and the PIC reported their position shortly before the accident as very close to what became the accident site. A review of the airplane's maintenance records and operating history did not reveal any recurrent maintenance discrepancies or mechanical anomaly that would have either caused or contributed to the accident.

The weather information provided to the flightcrew was found to be accurate. An AIRMET warned of IFR conditions and mountain obscuration. Shortly before the accident, at the time of the flight facilities inspection performed at their departure airport, W16, the pilots recognized the nature of local weather conditions. Ironically, the last radio call made by the PIC before takeoff was a precautionary statement to a ground technician about worsening weather conditions in the general direction of the intended flight.

Facilities at W16 included a transmitter/receiver that provided for direct communications with IAD approach control. The clearance delivery and departure control frequencies of the transmitter/receiver were listed in aeronautical navigation publications. The facilities were operating on the day of the accident and were mentioned to the PIC by the controller during the earlier approach and arrival at W16. Therefore, the Safety Board believes that the PIC made a deliberate decision not to use the ground communication facilities to obtain an IFR clearance before takeoff from W16.

The evidence of the southerly direction of the radar track of N82, the transcript of communications between its crew and air traffic control, and the

location of the wreckage, suggest that the flightcrew proceeded in the general direction to their destination of PHF. The Safety Board examined possible factors that might have motivated the PIC to take off under VFR during known marginal weather conditions without obtaining an IFR clearance, as well as to have remained aloft and flown into an area of mountainous terrain, at an altitude too low for en route flight.

The investigation disclosed that the PIC was recognized for, and wanted to complete, the facilities inspection mission and satisfy the mission accomplishment objectives of his immediate superiors. Some of his actions reflect that flight safety considerations did not appear to be a high priority to him. Evidence indicates that the SIC exhibited a more balanced approach than did the PIC between the needs of the mission and those of flight safety.

The Safety Board sought to determine the potential input of other crewmembers into the PIC's decision to proceed. However, because the FAA did not require the Beech 300/F fleet to be equipped with a CVR, such evidence was not available. Based on the evidence regarding the routine cockpit interpersonal atmosphere maintained by this PIC, the Safety Board believes that the SIC and the ET had little or no role in cockpit decision-making that led directly to the accident.

The Safety Board recognized the dilemma that was presented to the SIC as he was performing cockpit duties as the pilot flying on the accident flight. The SIC was a well-experienced pilot. There was a point at which the SIC could have refused to comply with the PIC's directions or to proceed with the flight. In hindsight, the SIC might have been able to exert sufficient influence or to actually take command of the airplane in order to avoid the accident. However, the Safety Board believes that the cockpit interpersonal relations and the management attitude at the ACY FIAO probably impeded such action by the SIC until the accident was unavoidable.

Evidence indicates that the accident was caused, in part, by three critical decisions of the PIC:

- Not to obtain an IFR clearance for the flight to PHF while on the runway at W16 even though the communications facilities were available,

- To take off and attempt visual flight into an area of mountainous terrain while encountering marginal VFR conditions; and

- To continue to remain aloft, at a low altitude, with insufficient distance from the clouds to maintain visual flight, and to proceed towards PHF (and the nearby mountains), under VFR, while waiting for an IFR clearance.

The Safety Board believes that all pilots must recognize that regardless of the perceived importance of completing a mission, each and every mission must be accomplished safely and efficiently. Because the PIC disregarded reasonable standards of flight safety, and the airplane was flown into an area of low ceilings and high terrain, the Safety Board concludes that the actions of the PIC, in part, caused this accident.

Given the decisions made by the PIC regarding this flight, and other evidence gathered about the PIC, the Safety Board examined the supervision of the PIC provided at the ACY FIAO. Such an examination is particularly warranted in noting that three turbine-powered airplanes have been destroyed during FIAO missions within the past 10 years. All three accidents involved a phase of flight that was not directly associated with specific facility flight inspection procedures, and occurred during a phase of flight that did not require an exemption of the FARs. Two accidents have resulted in fatal injuries to the flightcrews on board. The ACY FIAO operated the airplanes involved in both of the fatal accidents, and both of the fatally injured flightcrews were supervised by the same FO/SS. Both fatal accidents involved questions of PIC judgment and decision-making related to weather factors.

2.2 Supervision of the PIC

Safety Board investigators learned that the ACY management had witnessed a number of safety-related concerns regarding the PIC for several years before the accident. Among them were the following:

- His selection as PIC engendered objections from coworkers,

- More complaints were communicated to ACY management by other pilots about this PIC than were communicated about any other crewmember in the unit,

- He required three attempts to successfully complete a type rating check flight on the BE 300,

- Eight out of the eleven available SICs requested scheduling preference to avoid flying with him,

- He conducted some departures without the flightcrew's knowledge of essential flight planning information,

- He refused to accept responsibility that his failure to adhere to a checklist had caused an engine damage incident, and, most recently,

- He refused, 2 weeks before the accident, to respond to requests from a SIC for an explanation of an action that he had taken that potentially jeopardized flight safety.

In the incident that occurred 2 weeks before the accident, a SIC requested a formal investigation into what he charged was the PIC's deliberate violation of FIAO procedures by performing a below-glideslope maneuver close to the ground in IMC. Although the Safety Board was unable to determine whether the PIC had done this as alleged, evidence was obtained that by his refusal to reply to the SIC's flight safety concerns, the PIC demonstrated behavior that the Safety Board believes was inappropriate, and counter to the fundamental principles of flight safety. Therefore, for the purpose of mission management, the Safety Board believes that formal mission briefing and debriefing requirements should be established for FAA flying operations that involve an operations supervisor, as well as the PIC and all crewmembers.

The evidence indicates that the PIC had a record of noncompliance with the checklist and of displaying an impatient and arrogant attitude, as well as poor judgment/decision-making in the air and on the ground. For example, he reported the two DUIs on his FAA airman's medical application only when FAA authorities had already learned about them, or when it appeared that they would. In several ways, he demonstrated what can be characterized as a deliberate disregard for authority. For example, he allowed his New Jersey driver's license to be suspended twice in 1993 for failure to complete a state alcohol and drug Counter Measures Program and for failure to pay a related DUI surcharge. He also failed to inform New Jersey authorities of his Mississippi driver's license or to surrender his

Mississippi license when he received a license from New Jersey. He also failed to inform Mississippi authorities that it had been more than 20 years since he last resided at the Mississippi address he claimed during license renewals.

Given the PIC's attitudes and behavior, the Safety Board examined the nature of the FAA's ACY FIAO oversight over him and other PICs. The FO/SS was the de facto manager of ACY flight missions and the daily point of contact for all flightcrews. He was also the focal point for the FIAO Standardization Program, and he administered the ACY PIC check rides and written performance evaluations. In these capacities, he received the formal and informal complaints and handled incident reports. With regard to the PIC, he received complaints from other crewmembers about both his flying performance and his attitude in general. However, the evidence is consistent that complaints about the PIC stopped at the FO/SS's level. Despite these complaints, in the 6 years that the PIC was assigned to ACY, only one recorded action was taken by the FO/SS--the letter of reprimand following the engine damage incident that occurred in January 1993. Further, the evidence suggests that because of the financial implications of the engine replacement, knowledge of the incident could not be contained within the FIAO and the FO/SS was forced to take action against the PIC.

Notwithstanding the letter of reprimand, the repeated SIC complaints about the PIC, and the demonstrations of his poor judgment, the FO/SS not only failed to take necessary corrective action but, in fact, did the opposite. In the most recent performance appraisal before the accident, he rated the PIC positively, including "Proficient" on his "Interpersonal Skills" with specific compliments on his ability to "get along well with his fellow workers." Further, the performance appraisal stressed the PIC's productivity; no mention was made of adherence to flight safety principles.

The Safety Board believes that, given the numerous indications about this PIC's piloting, behavior, and judgment, the FO/SS had ample evidence to question the competency of the PIC and to remove him from flying responsibilities until a thorough evaluation of his performance was made. Such action should have been required as a result of the FO/SS's fundamental responsibilities to oversee the safety-of-flight operations. Because he did not do this, the Safety Board concludes that the failure of the FO/SS to carry out his responsibilities to ensure the safety of FIAO flight operations, in part, also caused this accident.

Moreover, the failure of the FO/SS to address the allegations regarding the PIC's performance in the glideslope incident sent a poor message to FIAO SICs and ETs. That message was, as the supervisor of PICs, he would not take action against PICs who potentially jeopardized the safety of flight. Even after the accident occurred, the FO/SS failed to inform the FIAO manager, his immediate supervisor, of the incident. The Safety Board believes that this act of omission demonstrated questionable judgment by someone entrusted with the responsibility of overseeing the safety of a flight operations unit.

2.3 FIAO Supervision

The poor supervision that the Safety Board observed extended from the FO/SS to the FIAO manager. In the 7 months from his arrival at ACY to the time of the accident, the FIAO manager had not yet actively involved himself in the oversight of flight operations, claiming that he did not wish to "micromanage" the unit. He had not reviewed any pilot personnel or training records. He was unaware of any complaints about the PIC involved in the accident and was only vaguely aware of the PIC's reprimand. The Safety Board believes that there had been sufficient time for the FIAO manager to have reviewed the management of the FO/SS and determined that his supervision was deficient. Such oversight could have taken place without contravening his desire to avoid micromanaging the unit. This oversight was, in fact, incumbent on him as the unit manager and as the final authority responsible for the safety of ACY flight operations. Because he did not perform this oversight, the Safety Board believes that the inaction of the FIAO manager, in part, also contributed to the accident.

The FIAO manager's supervisor, the manager, Airspace Systems Assurance Division, Oklahoma City, who was responsible for direct oversight of all FIAOs, failed to address the problems at ACY. This was particularly regrettable because immediately prior to assuming the manager position at AVN Headquarters, he had served as ACY FIAO manager for 10 months and thereby acquired an intimate knowledge of the problems at ACY. He reported to Safety Board investigators that he was well aware of the PIC's arrogant attitude. Subsequent to the accident, he told investigators that he believed the disciplinary action following the engine damage incident in January 1993 should have been more severe than a letter of reprimand. Also, he did not take action to evaluate the incident involving damaged brakes that occurred at OKC in the summer of 1993. That incident involved a probable checklist error by the PIC who was later involved in the fatal accident. Despite the division manager's awareness of the problems in ACY, in

general, and of the PIC, in particular, there is no evidence that he communicated his desires for stronger supervision of both the FIAO and the PIC to anyone in ACY. As a result, the Safety Board concludes that his oversight of the management of the ACY FIAO was deficient, and, as a result, inaction by the manager, Airspace Systems Assurance Division, was also, in part, causal to the accident.

2.4 Supervision and Oversight by Aviation System Standards (AVN)

Given the instances of inadequate oversight of the ACY FIAO, the Safety Board examined the nature of the overall management and administration of the flight inspection mission by the responsible entity, the Office of the Director of Aviation System Standards (AVN). The investigation found repeated instances of deficient management by AVN, as well as insufficient oversight from the FAA's executive levels. The Safety Board believes that an underlying cause of these inadequacies was the continuing failure of AVN to recognize and correct structural deficiencies within its own organization. These AVN organizational deficiencies prevented the adequate oversight of the flying operations. The Safety Board believes that AVN failed to initiate timely corrective action to remedy the oversight of the flying operation.

FIAO flight inspection missions consisted of two distinct elements--the facility inspections and the flights to and from the location being inspected, a positioning flight. This accident, and the two other AVN accidents cited previously, occurred during a positioning flight, or portion thereof, and were the type of mission that should have employed practices and procedures most like those of commercial operators. The Safety Board believes that the safety-related issues uncovered in this investigation concerned the "air transport" aspects of AVN flights, the aspects that were most amenable to the type of oversight the FAA routinely performs over air carriers. These aspects included operations, training, standardization, and the handling of flight safety incidents. Specific oversight inadequacies included requirements governing procedures, such as scheduling flightcrews and flight hour "equability," developing flight plans, determining minimum altitudes, anticipating weather, calculating fuel reserves, considering alternate airports, flightcrew briefings, and stabilized approach requirements. Because of the urgent need to address these deficiencies, the Safety Board issued Safety Recommendation A-93-168 to the FAA Administrator (see appendix D).

Since it issued that recommendation, the Safety Board found other inadequacies in AVN oversight. For example, the Safety Board has criticized air

carriers for a lack of continuity in the management of their safety of flight operations, as well as the FAA's oversight of the airlines.[10] Yet, AVN experienced a high rate of management turnover in those positions critical to the supervision of its missions. In the 2 years preceding the recent fatal accident, the ACY FIAO had three permanent and two temporary managers assigned. From the time of the last fatal AVN accident to the time of this accident, the AVN position, which was directly above the ACY and all FIAO mangers, was filled on a permanent basis by six different individuals--a turnover rate of one manager about every 14 months. This management turnover provided little consistency to AVN personnel in the interpretation and application of rules, regulations, and the development of improved aspects toward operational oversight. Such turnover within a commercial operator's management staff would normally prompt the CMO to intensify the frequency and depth of surveillance of the affected operator. Further, Safety Board investigators learned that management turnover also took place at the levels of Associate Administrator for Aviation Standards, and the Executive Director for System Operations. Within a 3-year period, six executives were incumbents in these two senior level positions. As a result, the Safety Board believes that the FAA should implement managerial controls to limit the turnover of key personnel to provide consistency among those responsible for the operation and oversight of the FAA flying program.

Further, AVN's own assessment of the quality of its operations proved inadequate. The most recent Standardization Visit and Compliance Review Evaluation Report on the ACY FIAO by AVN-520 and AVN-810, conducted only 2 months before the accident, gave no indication of the serious nature of deficiencies identified by ACY personnel during the accident investigation. Given that the ACY FIAO met the requirements of the two offices that were responsible for maintaining the quality standards of AVN, the Safety Board must question both the scope and depth of AVN-520 and AVN-810 inspections and the interaction of the inspectors with ACY personnel. The operational competence, the flightcrew scheduling, the work product, and the flight safety program at the ACY FIAO met the minimum AVN requirements. The Safety Board believes that as a result, the requirements of the oversight effort were not comprehensive enough to adequately evaluate the flying operation. Therefore, the Safety Board believes that AVN should establish inspection procedures of sufficient depth and scope that will reveal noncompliance

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[10] For example, see Aircraft Accident/Incident Summary Report, "Controlled Flight into Terrain, GP Express Airlines, Inc., Beech Aircraft Corporation C-99, N115GP, Shelton, Nebraska, April 28, 1993" (NTSB/AAR-94/01).

with directives and the fundamental principles of flight safety. Further, the lack of any centralized training records, proficiency reviews, or standardized check flight records and evaluations appeared to have negated efforts by AVN-520 and AVN-810 to standardize flying operations between FIAOs or within the FAA flying program. Therefore, the Safety Board believes that the FAA should establish standardized flight checks with CMO-approved pilot performance standards, overseen from the AVN Director's level. Such a system should require a central pilot record repository and a central check airmen pool. In addition, AVN should provide methodology and implement a plan to retrain, reassign or dismiss pilots who cannot meet the performance standards.

Evidence indicates that AVN thwarted the efforts of the FAA's Office of Flight Standards, the entity that could have provided high levels of oversight. Although AVN staff and the FAA's Flight Standards Office had worked together for several years to develop appropriate manuals (similar to those in commercial industry), none had been approved by Flight Standards at the time of this accident. Flight Standards personnel told Safety Board investigators that AVN personnel often complained to them that the "uniqueness" of their missions precluded adhering to the standard methods of oversight that the FAA expected of commercial operators. AVN had also held out to retain a final determination of applicable FARs and final acceptability of all manuals by the Director of AVN rather than submit to the authority of a CMO, as required for commercial operators.

The Safety Board believes that AVN failed to undertake actions that could have both substantially improved the safety of flight operations and conveyed to FIAO personnel the principle that flight safety considerations were an integral part of each mission priority. These actions, among others, should have included:

- Implementing approved operations, training and maintenance manuals,

- Installing CVRs, FDRs, and GPWS on all equipment,

- Standardizing PIC flight checks from AVN headquarters, rather than from the individual FIAOs,

- Maintaining and monitoring a central repository of pilot training and performance records,

- Implementing meaningful crew resource management (CRM) programs,

- Rewarding PICs for adhering to standards of safety equal to mission efficiency and accomplishment,

- Exercising rigorous supervision over the actions of the FO/SSs, and

- Providing management continuity, and encouraging oversight of operations and maintenance by entities outside of AVN.

AVN was aware of the need to implement these actions, most of which had been identified by the 1989 System Safety Survey and the 1990 System Safety Review. The survey provided a "laundry list" for AVN management to correct the noted deficiencies and to develop a flying program that meets safety standards that are comparable to the commercial air transport industry. The survey and the additional review provided an effective "checklist" for FAA senior executives responsible for the FAA flying program, and a way to measure the effectiveness of improvements at the levels of the Associate Administrator for Aviation Standards and the Executive Director for System Operations.

The Safety Board believes that the initiatives for change had lost momentum over time, and that AVN had lost its management focus to pursue the oversight necessary to conduct operations that met the same safety standards as those of the air carrier industry. At the time of the accident, evidence suggests that the initiatives taken in response to the survey and the review had been thwarted by a reluctant AVN bureaucracy, and by poor coordination and rivalries between AVN and the Office of Flight Standards, which was the FAA entity outside AVN that was best prepared to provide objective oversight. Although the response to the survey observations, and to the Safety Board's safety recommendations (see section 1.17.7) have received renewed attention following this accident, the Safety Board believes that the failure of senior FAA officials to act within a reasonable timeframe was regrettable. Because the Director, Office of Aviation Standards, and several Associate Administrators, Aviation System Standards, failed to implement initiatives necessary to improve the safety of AVN operations, initiatives that were identified following the 1988 fatal accident, the Safety Board believes that their inaction was, in part, a contributing cause to this accident.

2.5 Management and Oversight of FAA Flying Operations

In 1993, the FAA flying program accrued almost 50,000 flying hours. About one-half of that flying time was performed by FIAO flightcrews who were directly subordinate to AVN. In addition to the FIAOs, the Safety Board examined the oversight of other FAA flying operations and found inadequacies at all levels of oversight. Although AVN is charged to "manage the agency aircraft program," direct line authority from AVN could not be identified either to the flying units or to an organization or individual with the responsibility and authority to provide oversight to the operations. Again, operations, training and maintenance manuals were not finalized, and negotiation was incomplete regarding the matter of external objective oversight and enforcement. Given the amount of flying time performed and the sensitive nature of public-use aircraft operating in the NAS, the Safety Board believes that all aspects of the entire FAA flying program, including applicable FARs, operations specifications, manuals, and direct lines of authority, should be the subject of ongoing CMO oversight.

The Safety Board recognizes that AVN management had planned to implement crew resource management (CRM) instruction among its FIAO units, but because it was not implemented before this accident, such training did not occur. As a result, the Safety Board issued Safety Recommendations A-93-163 and A-93-164 to the FAA (see appendix D). However, the Safety Board cautions that progress with CRM and aeronautical decision-making (ADM) training will first require alteration of the operational relationships between the three crewmembers on flight inspection missions. Without such changes, experience indicates few positive benefits will be realized.

The Safety Board was also surprised to learn that the FAA did not require standards for the type of operational experience needed by managers, directors, assistants, and senior executives who oversee flight operations. By contrast, FAA regulations governing the management of air carriers and regional airlines are specific in describing the positions and the minimum aviation experience of individuals with the responsibility and authority to oversee flight operations and maintenance. As a result, FAA flight operations, on occasion, have been overseen by personnel with no flight operations experience. Although these individuals were experienced in administrative matters and FAA practices, the Safety Board believes that their lack of flight operations experience detracted from their ability to provide adequate guidance and oversight.

By contrast, the National Aeronautics and Space Administration (NASA), like the FAA, had operated with several semiautonomous entities performing airplane flight missions in over 100 aircraft with little or no centralized oversight and standardization. According to a NASA official, after several flight safety-related mishaps, NASA assigned one individual to standardize, to the extent possible, the diverse nature of its flight operations and, more important, to develop and implement improvements to the safety of the diverse operations. NASA placed this position within its Aircraft Management Office (AMO) at a level within its organization that ensured that actions to correct safety-related deficiencies would be identified and implemented. The AMO is subordinate to the NASA Administrator through only one management level; the AMO reports to the Associate Administrator, Office of Management Systems Facilities, (see appendix F for NASA program information). By contrast, the Safety Board believes that despite AVN's assignment of an individual to serve as an SFSO, a position similar to that developed at NASA, the SFSO had neither the mandate, the management support, nor the organizational stature to carry out responsibilities similar to those performed by the safety officer at NASA.

The Safety Board believes that the FAA should, as soon as possible, standardize the procedures of all its flight missions, perhaps using an approach similar to that of NASA or scheduled airlines. Regardless of the method employed, the Safety Board urges the FAA to:

> Develop an approved set of procedures and manuals to govern the conduct of all FAA flight missions (required by FAA Order 4040.23, dated November 25, 1991),
>
> Provide clear and direct lines of authority between those responsible to either manage or oversee the FAA flying program and the flying office or unit;
>
> Assign an individual to serve as flight safety officer over all flying operations, with the authority, background, management support and organizational stature to ensure that his or her recommendations will be considered and acted upon by the FAA executive responsible for the flying program,
>
> Provide the level of oversight to its own flying operations that it provides to the flying operations of air carrier operators,

Develop and implement procedures to reduce the rate of turnover in personnel who manage or oversee its own flying operations, and

Require flight operations-related experience of those individuals who manage or oversee flight operations activities.

2.6 CMO Oversight of AVN Flying Operations

The CMO, located in Dallas, Texas, was designated by Flight Standards Service to oversee the FAA Flying Program managed by AVN. A letter from the CMO dated October 22, 1993, issued just 4 days before the accident, illustrated the frustration experienced by Flight Standards personnel in their attempts to provide traditional Flight Standards oversight to a sister FAA organization. The topics outlined in the letter were related to items identified as critical to flight safety after the FIAO's fatal accident in 1988 and enumerated in the related survey of 1989 and the review of 1990. The status of many items could be characterized by delay, haggling and inaction on the part of AVN.

The difficulties presented by the lack of air carrier operations specifications, approved manuals, and training programs require some very special accommodation by both the operator and the oversight agency to initiate and sustain any sense of traditional oversight and enforcement. The negotiations since the fatal accident in 1988 have not produced a solution. The Safety Board concluded that direct involvement at a very senior level is necessary to bring the FAA flying program into compliance with surveillance and oversight equal to that of the air carrier industry. Therefore, the Safety Board issued safety recommendation A-93-168 to the FAA Administrator (see appendix D).

2.7 FAA Policy on Flight Recorders and Ground Proximity Warning Systems (GPWS)

The Safety Board was disappointed to learn that the FAA's Beech 300/F airplane fleet final procurement package did not include flight recorders or a ground proximity warning system (GPWS). Flight recorders, both FDRs and CVRs, have provided invaluable flight safety information in accident and incident investigations. The missions of these airplanes in the NAS exposes them to a high traffic density, low altitude environment for extended periods. The absence of a CVR deprived this investigation of insight into the crew actions and the crew decision-making that took place within the cockpit.

Further, the absence of a GPWS, while not substituting for the fundamental principles of safe flight planning, deprived the flightcrew of an opportunity to avoid collision with terrain. Perhaps as important, the FAA's failure to install this equipment communicated that it was neither as attentive to flight safety as it could have been nor did it require its own operations to adhere to the same standards expected of commercial operators of passenger-carrying aircraft. The comment by the FIAO manager to a newspaper reporter after the accident that GPWS equipment was inappropriate and would produce "nuisance warnings" was not justified under the circumstances of the accident. A Safety Board reconstruction of the ground track indicated that the flightcrew would have received ground proximity warnings twice prior to impact with terrain.[11] The first would have been a mode 4 warning (proximity to terrain when not in landing configuration) approximately 3 minutes prior to the accident as the airplane was maneuvering in the vicinity of High Knob Mountain. This warning would have lasted for 30 seconds as the airplane's proximity to terrain decreased below a radio altitude of 500 feet agl. The second warning would have begun as a mode 4 and would have changed to a sustained mode 2 (excessive terrain closure rate) as the airplane's flightpath converged with the terrain. The second warning would have started approximately 30 seconds prior to impact with terrain (see figure 5).

Although AVN officials informed Safety Board investigators of their decision to incorporate CVRs on future AVN aircraft, the Safety Board believes that the FAA should install appropriate flight recorders and the GPWS on all FAA-owned aircraft. Therefore, the Safety Board urges the FAA, at the earliest opportunity, to equip its aircraft with appropriate flight recorders and ground proximity warning systems.

2.8 FAA Policy Regarding DUI Convictions

The Safety Board was pleased to learn that the FAA Civil Aviation Medical Institute (CAMI) required the PIC to submit a formal evaluation of his drinking habits by a substance abuse specialist. The PIC consulted a specialist who possessed recognized qualifications. The specialist's evaluation concluded that the PIC did not have an alcohol abuse problem, and, as a result, the FAA approved his receiving a first class medical certificate. However, the Safety Board learned that

[11] Modern GPWS equipment provides a variety of situational warnings. In the context of this accident, Technical Standard Order-C92b specifies that the mode four warning becomes active at an altitude below 500 feet agl and that the mode two warning becomes active at varying terrain closure rates related to height above the terrain.

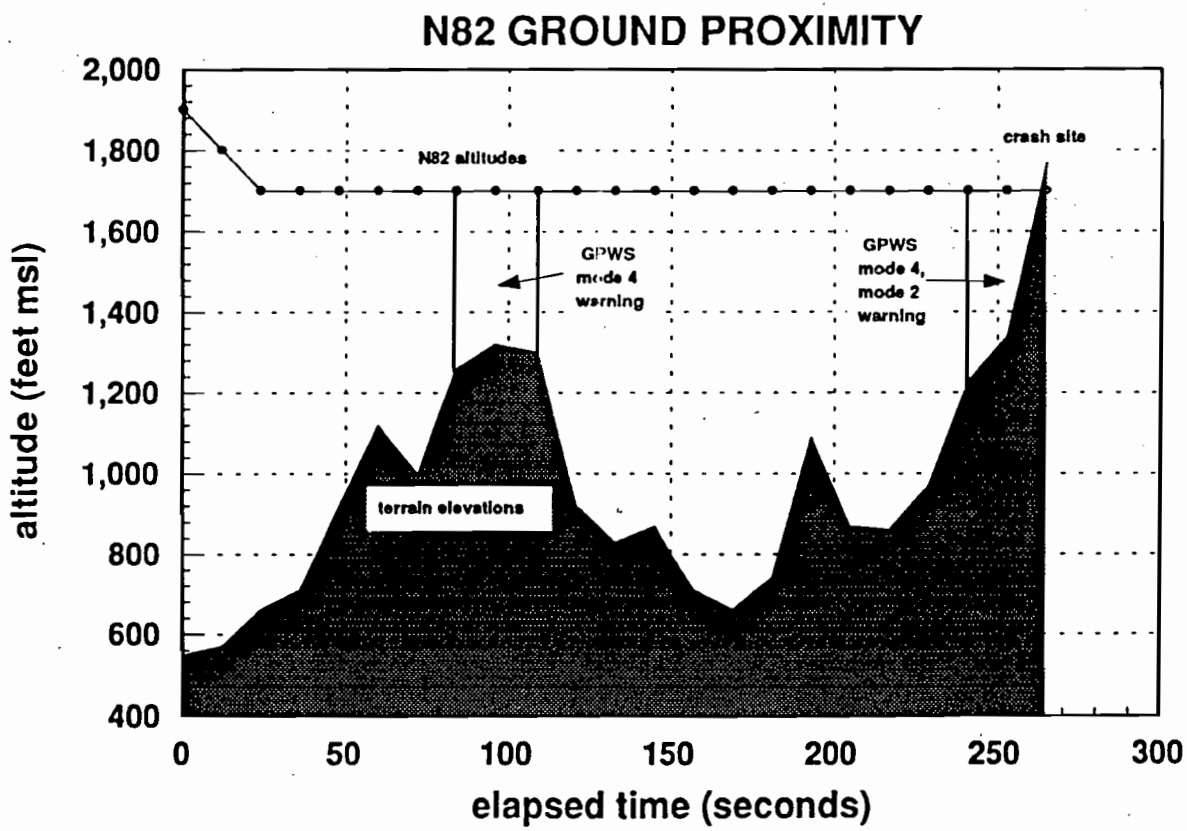


Figure 5.--GPWS warnings from ground track reconstruction.

the FAA neither stipulates training or certification requirements required of a substance abuse specialist nor specifies the nature of the procedures to be performed in the specialist's examination. A cursory history taking, for example, with no further physical examination, would be acceptable to CAMI. Further, with no training or certification requirement, an individual having no specific training in substance abuse recognition could perform an evaluation and have it accepted by the FAA.

Although there was no evidence that alcohol or drug use played a part in this accident, the Safety Board is concerned that an alcohol or drug abuser could continue receiving airman medical certification based on an incomplete examination by an unqualified specialist. As a result, the Safety Board believes that the FAA should stipulate training and certification standards required of a substance abuse specialist, and that the FAA should specify the nature of the examination procedures required by such a specialist, similar to training and certification standards and examinations used by air carriers, before the specialist's evaluation will be accepted by the FAA to issue airman medical certification.

3. CONCLUSIONS

3.1 Findings

1. An exemption from the FARs was not required to conduct this FIAO positioning flight.

2. The pilot-in-command and the second-in-command were properly certificated, trained, and qualified to operate the airplane.

3. Airplane maintenance and reliability were not factors in the accident.

4. The electronics technician was not assigned any mission tasks in positioning flights and therefore probably played no role in the accident.

5. Weather forecasts and AIRMET information provided to the flightcrew were correct and contained advisories of low ceilings and obscurations.

6. Air traffic control handling of the flight was appropriate and was not a factor in the accident.

7. The second-in-command's participation in the captain's aeronautical decision-making and other events of the flight could not be ascertained because the FAA eliminated the cockpit voice recorder from the procurement specifications of the airplane.

8. The pilot-in-command was the nonflying pilot, and he made a series of inappropriate decisions to take off and secure an IFR clearance in the air while proceeding into an area of mountainous terrain during marginal visual meteorological conditions.

9. Several organizational factors, such as the limited flight time scheduling and the supervisory structure, lowered the stature of the second-in-command pilots and limited their ability to contribute to the safe operation of AVN airplanes.

10. No formal or informal crew resource management program was in effect within the FAA flying operation.

11. The FAA did not equip the airplane with a ground proximity warning system, thereby depriving the flightcrew of the obvious advantages of such a system to avoid collision with terrain.

12. Although the pilot-in-command was considered by his supervisor to have a strong dedication toward mission accomplishment, he had a history of substandard flying performance, poor decision-making related to instrument flying and poor communication with cockpit crew members.

13. FAA management at both the local and AVN headquarters were aware of, but did not adequately address, repeated indications that the pilot-in-command's airmanship and judgment were deficient. These deficiencies continued to the time of the accident.

14. AVN management provided inefficient central oversight of the organization, thereby depriving the flying operation of effective flightcrew quality control and standardization.

15. There was no requirement for complete mission briefings or debriefings for the FAA flying program.

16. AVN headquarters organizational structure purported to provide management of the FAA flying program similar to management of air carrier operations. However, at the headquarters level, critical positions of check airman, training captain, fleet manager/chief standardization and flight safety officer were subordinate to nonflying managers and at the operating units positions existed only as additional duties. These organizational deficiencies precluded the application of functional oversight of

flight operations and viable inputs regarding flight safety-related matters.

17. AVN management of the FAA flying program (which accumulated almost 50,000 flying hours in FY 93) was ineffective because: (a) the airplane fleet operated across the lines of authority of two Executive Directors, three Associate Administrators, nine Regional Division Managers, and numerous office/branch managers, and (b) the designated management organization, AVN, was, in actuality, one of the operative organizations.

18. The Certificate Management Office of Flight Standards Service did not exercise its authority to approve operations specifications and manuals for the FAA flying program because the Director of AVN continued to maintain authority to select applicable FARs and to determine the acceptability of manuals within the AVN organization. Surveillance of FAA flying activity by Flight Standards inspectors did not exist.

19. The deficiencies identified after the FAA-owned Rockwell Jet Commander fatal airplane accident in 1988 were not corrected because management action was ineffective and oversight by senior executives was insufficient.

20. On two occasions discrepancies or delays were encountered in the PIC's reporting of his DUI convictions, and the FAA did not take either personnel or certificate action.

21. FAA medical requirements neither stipulate the training or certification standards required of a substance abuse specialist nor specify the nature of the evaluation the specialist must provide to determine a potential substance abuse problem.

3.2 Probable Cause

The National Transportation Safety Board determines that the probable causes of this accident were the failure of the pilot-in-command to ensure that the airplane remained in visual meteorological conditions over mountainous terrain, and the failure of Federal Aviation Administration executives and managers responsible for the FAA flying program to: (1) establish effective and accountable leadership and oversight of flying operations; (2) establish minimum mission and operational performance standards; (3) recognize and address performance-related problems among the organization's pilots; and (4) remove from flight operations duty pilots who were not performing to standards.

4. RECOMMENDATIONS

As a result of this investigation, the National Transportation Safety Board makes the following recommendations:

--to the Federal Aviation Administration:

Provide direct line authority to the executives and managers responsible for the management and oversight of the FAA flying program to ensure safety oversight and accountability of the program equal to that required of the air carrier industry by the FAA. (Class II, Priority Action) (A-94-84)

Establish minimum standards of operational experience for managers and executives who are identified as responsible for the management or oversight of the FAA flying program. (Class II, Priority Action) (A-94-85)

Establish inspection procedures of sufficient depth and scope that will reveal noncompliance with directives and the fundamental principles of flight safety. The procedures should include CMO-approved pilot flight check standards for the FAA flying program, overseen from the AVN Director's level. Such a system should include a central pilot record repository and a central check airmen pool. Provide methodology and implement a plan to retrain, reassign or dismiss pilots who cannot meet the performance standards. Class II, Priority Action) (A-94-86)

Improve criteria to specify the operational and maintenance-related incidents that are required to be reported to a central AVN authority; and implement procedures to verify that all incidents meeting such criteria are being reported as required. (Class II, Priority Action) (A-94-87)

Develop and implement a program guaranteeing that personnel who bring safety-related concerns to the attention of management can do so without fear of retribution, and with the assurance that such concerns will be addressed thoroughly and impartially. (Class II, Priority Action) (A-94-88)

Equip FAA-owned aircraft with state-of-the-art flight recorders and ground proximity warning systems at the earliest practicable opportunity. (Class II, Priority Action) (A-94-89)

For the purpose of mission management, establish formal mission briefing and debriefing requirements for FAA flying operations that involve an operations supervisor, the PIC, and all crewmembers. (Class II, Priority Action) (A-94-90)

Stipulate specific training and certification standards required of a substance abuse specialist, and specify the nature of the procedures required for the examination by such a specialist, similar to training and certification standards and examinations used in the air carrier industry, before his/her evaluation will be accepted by the FAA in its decision to issue an airman medical certificate. (Class II, Priority Action) (A-94-91)

Also, as a result of the investigation of this accident, on November 24, 1993, the Safety Board issued one Urgent Action recommendation and seven Priority Action recommendations to the FAA (see appendix D). The FAA Administrator replied to these recommendations in a letter dated January 31, 1994, a copy of which is included in appendix D.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

Carl W. Vogt
Chairman

John K. Lauber
Member

John Hammerschmidt
Member

James E. Hall
Member

April 12, 1994

5. APPENDIXES

APPENDIX A

INVESTIGATION AND HEARING

1. Investigation

The National Transportation Safety Board was notified of the accident about 1630 on October 26, 1993. The Safety Board has a formal agreement with the FAA to investigate accidents involving the FAA's "public use" airplanes.

A full go-team was dispatched from Washington, D.C., shortly after the accident. On-scene investigative groups were formed for structures/systems, powerplants, witnesses, air traffic control, and weather. Groups were also formed at the Atlantic City FIAO for operations/human performance, and maintenance records. In addition, an aircraft performance and radar study was completed. A Safety Board member did not accompany the investigative team to the scene, but a public affairs staff member was present.

Parties to the investigation included Beech Aircraft Corporation, Pratt and Whitney, Canada, Professional Airways Systems Specialists, the National Air Traffic Controllers Association, and the Federal Aviation Administration.

2. Public Hearing

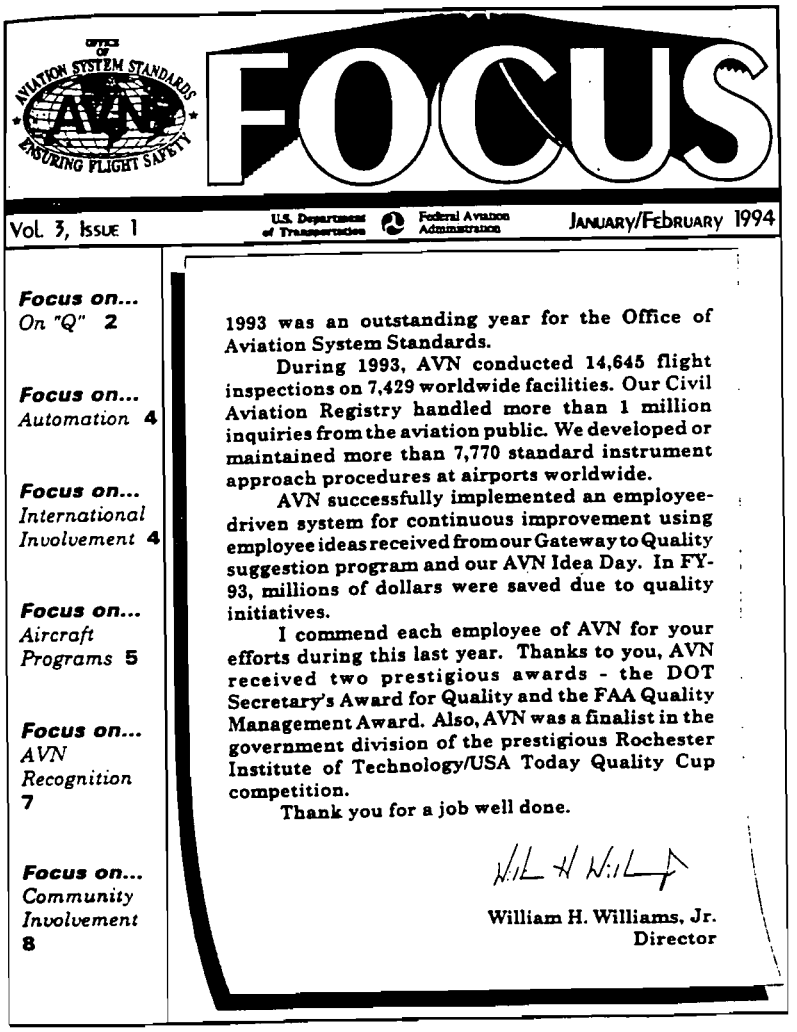
There was no Safety Board public hearing associated with this accident.

APPENDIX B

FAA AIRCRAFT MANAGEMENT PROGRAM

Aviation System Standards (AVN)

The Director of AVN was responsible for the management of the FAA Aircraft Program (flying program). Administrative oversight of all operators within the entire flying program was provided by a subordinate division and branch within AVN. In addition to managing the FAA flying program, the Director of AVN was responsible for a Regulatory Support Division and the Civil Aviation Registry (aircraft and airman's records). The following is a copy of the cover page from AVN's January/February 1994 issue of its newsletter *FOCUS*:



OFFICE OF AVIATION SYSTEM STANDARDS AVN ENSURING FLIGHT SAFETY

FOCUS

Vol. 3, Issue 1 | U.S. Department of Transportation | Federal Aviation Administration | January/February 1994

Focus on... *On "Q"* 2

Focus on... *Automation* 4

Focus on... *International Involvement* 4

Focus on... *Aircraft Programs* 5

Focus on... *AVN Recognition* 7

Focus on... *Community Involvement* 8

1993 was an outstanding year for the Office of Aviation System Standards.

During 1993, AVN conducted 14,645 flight inspections on 7,429 worldwide facilities. Our Civil Aviation Registry handled more than 1 million inquiries from the aviation public. We developed or maintained more than 7,770 standard instrument approach procedures at airports worldwide.

AVN successfully implemented an employee-driven system for continuous improvement using employee ideas received from our Gateway to Quality suggestion program and our AVN Idea Day. In FY-93, millions of dollars were saved due to quality initiatives.

I commend each employee of AVN for your efforts during this last year. Thanks to you, AVN received two prestigious awards - the DOT Secretary's Award for Quality and the FAA Quality Management Award. Also, AVN was a finalist in the government division of the prestigious Rochester Institute of Technology/USA Today Quality Cup competition.

Thank you for a job well done.

William H. Williams, Jr.
Director

The flying hours in support of airways facilities inspection missions were accrued by nine FIAOs located worldwide. These FIAOs reported to AVN through the Airspace System Assurance Division (AVN-800). Airways facilities inspection flightcrews inspected navigational aids for safe and accurate signal-in-space guidance; flightcrews also flight checked instrument flight procedures to ensure that they were practical, created minimum additional cockpit workload, and could be easily interpreted by flightcrews.

The Manager, AVN-800, is responsible to the Director, Office of Aviation System Standards, (AVN-1), who reports to the Associate Administrator for Aviation Standards (AVS-1), who, in turn, reports to the Executive Director for System Operations (AXO).

The flight inspection fleet consisted of 34 aircraft: 19 BE-300s; 6 BAe-800s, 6 Sabreliner NA-265s; 2 Convair CV-580s, and 2 BE-F90s.

The Aviation Systems Standards program flew 23,753 hours in fiscal year 1993, of which 561 hours were rental aircraft.

Washington Headquarters Support (AVS-60)

The AVS-60 airplanes are used to conduct recurrent flight training for aviation safety inspectors, to provide recent flight experience and proficiency flight hours for key headquarters officials, to evaluate the national airspace system, and to transport the National Transportation Safety Board and FAA accident investigation teams. These aircraft also provide transportation for senior level officials on high-priority missions that cannot be reasonably accommodated by commercial air service.

AVS-60 operated two FAA-owned aircraft, a Gulfstream G-IV and a Gulfstream G-I. A leased Learjet 31A was also assigned to AVS-60. Open-market rentals augment the AVS-60 operation. AVS-60 flew 2,883 hours in fiscal year 1993, of which 558 hours were rental aircraft and 1,361 hours were in the leased Learjet.

The Manager, AVS-60, is responsible to the Associate Administrator for Aviation Standards (AVS-1) who reports to the AXO.

Regional Flight Programs

More than 1,100 pilots with responsibilities for aviation safety, air traffic control, or the National Airspace System (NAS) participated in the FAA's support program in nine regions. Five agency-owned BE-90 aircraft were assigned to the regional flight programs. One each was assigned to the Northwest Mountain Region, Central Region, Southwest Region, Southern Region, and the Great Lakes Region. Flight Inspection BE-F90 aircraft, based at the Anchorage and Sacramento Flight Inspection Area Offices, are shared with the Alaskan and Western-Pacific Regions. The majority of the flight hours in this program were flown in rental aircraft. The fiscal year 1993 flying hour report documented 13,732 hours of rental aircraft time in the total of 17,922 hours flown.

The individual Flight Standards Division Managers are responsible for the program. They report to the Director, Flight Standards Service, AFS, who, in turn, reports to the AXO.

FAA Technical Center (ACN-700)

The FAA's research and development (R&D) program is conducted at the Technical Center, Atlantic City, New Jersey. The R&D flight program targets research and evaluation of new navigation and communication aids, air traffic procedures, collision avoidance, improved aircraft safety, and aviation medicine and human factors advancements. Aircraft used in these research programs serve as extensions of the laboratory and were repeatedly modified to accommodate the instrumentation and antennas necessary for measurement and evaluation during in-flight testing.

ACN-700 operated nine FAA-owned aircraft for R&D activities: two Boeing 727s, one Aero Commander, one BE-200, one Bell UH-1H helicopter, one Sikorsky SK-76 helicopter, and three Convair CV-580s.

The Manager, ACN-700, is responsible to the Associate Administrator for the Technical Center, who reports to the Executive Director of System Development (AXD).

A total of 1,387 hours were flown in fiscal year 1993, of which 88 hours were in rental aircraft.

FAA Academy (AMA-200)

The FAA Academy provided flight training for FAA employees whose jobs require flight skills. The majority of the flight training was provided to aviation safety inspectors, but training was also provided to airworthiness technical personnel and flight inspection pilots and technicians.

The Director, AMA-200, is responsible to the Director, Mike Monroney Aeronautical Center, who reports to the AXO.

FAA Academy owned airplanes used for training included two BE-F90s, and a Douglas DC-9. Two leased Cessna 560s were also used for training. The Academy also used OKC FIAO aircraft for training. These included NA-265 Sabreliners and the BE-300/F. In addition to the owned/leased aircraft, the FAA used rental airplanes such as the Beech F-33, BE-58 and BE-300, and the Boeing 727.

The training flight program flew a total of 3,535 hours, of which 1,468 hours were in rental aircraft and 666 hours were in the leased Cessna 560s.

National Transportation Safety Board
Washington, D.C. 20594

Brief of Accident

File No. - 2231 9/29/86 LIBERAL,KS A/C Reg. No. N64 Time (Lcl) - 1204 CDT

----Basic Information----

Type Operating Certificate-NONE (GENERAL AVIATION)
Type of Operation -PUBLIC USE
Flight Conducted Under -14 CFR 91
Accident Occurred During -LANDING

Aircraft Damage
SUBSTANTIAL
Fire
NONE

Injuries	Fatal	Serious	Minor	None
Crew	0	0	0	2
Pass	0	0	0	2

----Aircraft Information----

Make/Model - ROCKWELL NA-265-80
Landing Gear - TRICYCLE-RETRACTABLE
Max Gross Wt - 23000
No. of Seats - 5

Eng Make/Model - GEN. ELEC. CF700-2D-2
Number Engines - 2
Engine Type - TURBOFAN
Rated Power - 4500 LBS THRUST

ELT Installed/Activated - YES/YES
Stall Warning System - YES

----Environment/Operations Information----

Weather Data
Wx Briefing - UNK/NR
Method - UNK/NR
Completeness - UNK/NR
Basic Weather - VMC
Wind Dir/Speed- 010/009 KTS
Visibility - 15.0 SM
Lowest Sky/Clouds - 1500 FT
Lowest Ceiling - 1500 FT BROKEN
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
OKLAHOMA CITY,OK
Destination
SAME AS ACC/INC

ATC/Airspace
Type of Flight Plan - IFR
Type of Clearance - IFR
Type Apch/Lndg - VOR/TVOR
FULL STOP

Airport Proximity
UNK/NR

Airport Data
MUNICIPAL
Runway Ident - 03
Runway Lth/Wid - 6999/ 150
Runway Surface - ASPHALT
Runway Status - DRY

----Personnel Information----

Pilot-In-Command
Certificate(s)/Rating(s)
COMMERCIAL,ATP
SE LAND,ME LAND

Age - 38
Biennial Flight Review
Current - YES
Months Since - 2
Aircraft Type - NA-265

Medical Certificate - VALID MEDICAL-NO WAIVERS/LIMIT
Flight Time (Hours)
Total - 8448
Make/Model- 1540
Instrument- UNK/NR
Multi-Eng - UNK/NR
Last 24 Hrs - 2
Last 30 Days- UNK/NR
Last 90 Days- UNK/NR
Rotorcraft - UNK/NR

Instrument Rating(s) - AIRPLANE

----Narrative----

THE RIGHT MAIN LANDING GEAR DOWNLOCK PIN RETRACTED JUST BEFORE OR DURING TOUCHDOWN. THE AIRPLANE TOUCHED DOWN 21 FEET SHORT OF THE RUNWAY. IT TRAVELED THAT 21 FEET, TRAVELED THE FULL LENGTH OF THE 6999-FOOT RUNWAY, THEN TRAVELED ANOTHER ONE-FOURTH OF A MILE AND STOPPED ON A GOLF COURSE. NO PRE-TOUCHDOWN MECHANICAL, HYDRAULIC OR ELECTRICAL PROBLEMS COULD BE FOUND.

File No. - 2231 9/29/86 LIBERAL,KS A/C Reg. No. N64 Time (Lcl) - 1204 CDT

Occurrence #1 GEAR COLLAPSED
Phase of Operation LANDING - FLARE/TOUCHDOWN

Finding(s)
1. PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
2. GEAR RETRACTION - INADVERTENT - COPILOT

Occurrence #2 LOSS OF CONTROL - ON GROUND
Phase of Operation LANDING - ROLL

Occurrence #3 ON GROUND COLLISION WITH TERRAIN
Phase of Operation LANDING - ROLL

Finding(s)
3. TERRAIN CONDITION - DITCH

Occurrence #4 ON GROUND COLLISION WITH OBJECT
Phase of Operation LANDING - ROLL

Finding(s)
4. OBJECT - FENCE

Occurrence #5 ON GROUND COLLISION WITH TERRAIN
Phase of Operation LANDING - ROLL

Finding(s)
5. TERRAIN CONDITION - WATER,GLASSY

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are finding(s) 1,2

Factor(s) relating to this accident is/are finding(s) 3,4,5

National Transportation Safety Board
Washington, D.C. 20594

Brief of Accident

File No. - 1059 11/02/88 OAK GROVE,PA A/C Reg. No. N44 Time (Lcl) - 1013 EST

----Basic Information----

Type Operating Certificate-NONE (GENERAL AVIATION)
Type of Operation -FAA FLT INSP
Flight Conducted Under -14 CFR 91
Accident Occurred During -CRUISE

Aircraft Damage
DESTROYED
Fire
ON GROUND

Injuries	Fatal	Serious	Minor	None
Crew	3	0	0	0
Pass	0	0	0	0

----Aircraft Information----

Make/Model - ROCKWELL 1121A
Landing Gear - TRICYCLE-RETRACTABLE
Max Gross Wt - 18500
No. of Seats - 3

Eng Make/Model - GEN ELEC CJ-610-5
Number Engines - 2
Engine Type - TURBOJET
Rated Power - 2950 HP

ELT Installed/Activated - YES/NO
Stall Warning System - YES

----Environment/Operations Information----

Weather Data
Wx Briefing - FSS
Method - IN PERSON
Completeness - FULL
Basic Weather - IMC
Wind Dir/Speed- 250/010 KTS
Visibility - 6.0 SM
Lowest Sky/Clouds - N/A
Lowest Ceiling - 800 FT BROKEN
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
PITTSBURGH,PA
Destination
LATROBE,PA

ATC/Airspace
Type of Flight Plan - IFR
Type of Clearance - IFR
Type Apch/Lndg - ILS-COMPLETE

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
WESTMORELAND CO.
Runway Ident - 23
Runway Lth/Wid - 5501/ 100
Runway Surface - ASPHALT
Runway Status - WET

----Personnel Information----

Pilot-In-Command
Certificate(s)/Rating(s)
COMMERCIAL,ATP
SE LAND,ME LAND

Age - 64
Biennial Flight Review
Current - YES
Months Since - 1
Aircraft Type - 1121

Medical Certificate - VALID MEDICAL-WAIVERS/LIMIT
Flight Time (Hours)
Total - 16957
Make/Model- 4428
Instrument- 2370
Multi-Eng - 16751
Last 24 Hrs - 10
Last 30 Days- 24
Last 90 Days- 94

Instrument Rating(s) - AIRPLANE

----Narrative----

ACFT ENTERED AN AREA OF FCST MOD ICING. ICE DETECTION SYS HAD BEEN INTRMTLY INOP. THE ACFT ENTERED HOLDING IN ICING COND WHILE CKG FLT INSP EQUIP. EVIDENCE INDICATED CREW NOTED ICE ACCRETION, ACTIVATED SURFACE DE-ICE SYS, ICE BROKE LOOSE AND ENTERED ENG INTAKES. BOTH ENGS FLAMED OUT. DRG EMERG DESCENT CREW INIT RE-STARTS, BUT NEITHER ENG WOULD SUSTAIN PWR. CREW RQSTD VECTORS TO MORE DISTANT AIRPORT. BOTH PLTS WERE SEEN DRINKING PREV NIGHT. C/P HAD RECENTLY LOST DRIVERS LICENSE FOR DUI. CAPT HAD DECIDED TO RETIRE THAT DAY. C/P HAD WORKED IN FLT OPS 3 DAYS IN 8 WKS AND HAD LMTD TRNG IN FLT INSPECTION. BOTH PLTS HAD PERSONAL STRESSES WHICH MAY HAVE INFLUENCED PERFORMANCE. CAPT'S CONTAMINATED THORACIC BLOOD REVEALED 0.057% ALCOHOL. PUTRIFICATION WOULD ACCT FOR PART OF ALCOHOL LEVEL. C/P HAD TRACE ALCOHOL IN URINE ONLY. BOTH ENGS SHOWED COMPRESSOR FOD CONSISTENT WITH ICE INGESTION. NO OTHER ACFT SYS OR ENG MALFUNCTION FOUND.

File No. - 1059 11/02/88 OAK GROVE,PA A/C Reg. No. N44 Time (Lcl) - 1013 EST

Occurrence #1 IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation CRUISE - HOLDING(IFR)

Finding(s)
1. WEATHER CONDITION - ICING CONDITIONS
2. ICE/FROST REMOVAL FROM AIRCRAFT - DELAYED - PILOT IN COMMAND
3. INATTENTIVE - PILOT IN COMMAND
4. PSYCHOLOGICAL CONDITION - PILOT IN COMMAND
5. PSYCHOLOGICAL CONDITION - COPILOT/SECOND PILOT
6. INADEQUATE INITIAL TRAINING - COPILOT/SECOND PILOT
7. INADEQUATE SURVEILLANCE OF OPERATION,INSUFFICIENT STAFF - FAA(ORGANIZATION)

Occurrence #2 LOSS OF ENGINE POWER(TOTAL) - NON-MECHANICAL
Phase of Operation CRUISE - HOLDING(IFR)

Finding(s)
8. FUSELAGE - ICE
9. ICE/FROST REMOVAL FROM AIRCRAFT - PERFORMED -
10. COMPRESSOR ASSEMBLY,BLADE - FOREIGN OBJECT DAMAGE

Occurrence #3 IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation DESCENT - EMERGENCY

Finding(s)
11. OBJECT - TREE(S)

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are finding(s) 2,10

Factor(s) relating to this accident is/are finding(s) 1,3,4,5,6,8

APPENDIX D

SAFETY BOARD SAFETY RECOMMENDATIONS

AND FAA RESPONSE

National Transportation Safety Board
Washington, D.C. 20594
Safety Recommendation

Date: November 24, 1993

In reply refer to: A-93-161 through -168

Honorable David R. Hinson
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On October 26, 1993, about 1552,[1] N82, a Beech Super King Air 300/F, owned by the Federal Aviation Administration (FAA) and operated by the Flight Inspection Area Office (FIAO) at Atlantic City, New Jersey, was destroyed due to an in-flight collision with terrain near Front Royal, Virginia. All three crewmembers received fatal injuries. The airplane had departed the nearby Winchester Regional Airport in visual meteorological conditions (VMC). However, witnesses indicated that instrument meteorological conditions (IMC) prevailed at the accident site, which was about 15 miles from the departure airfield. An instrument flight rules (IFR) flight plan to Newport News, Virginia, was on file in the Air Traffic Control (ATC) system, but the flight plan had not yet been activated. The flight was operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91.

The airplane originally departed Atlantic City International Airport, New Jersey, about 1330, and had completed a flight inspection of the instrument landing system runway 32 localizer at Winchester about 1540. The trip to Newport News was to be a routine point-to-point flight to an overnight stop in preparation for flight inspection missions scheduled for the next day.

[1] All times herein are eastern daylight time, in accordance with the 24-hour clock.

The airplane was not equipped, nor required to be equipped, with a cockpit voice recorder, a flight data recorder, or a ground proximity warning system.

ATC recorded communications indicate that the accident occurred while the airplane was awaiting a clearance to proceed IFR to the final destination. The pilot reported to the local ATC sector,

> We're over Linden VOR at 2 thousand, can you get us a little higher, VFR on top, and we'll be on our way.

Elevation of the Linden VOR is 2,472 feet mean sea level (msl). On-site investigation revealed that the airplane initially struck a tree-covered ridge about 5 nautical miles east of the VOR about 1,900 feet msl. Witnesses reported that the ridge line was obscured by a cloud cover at the time of the accident. Other witnesses observed the airplane circling near the accident site and in proximity to terrain with elevations up to 2,388 feet msl.

Although the investigation is continuing and the probable cause has not been determined, the performance of the flightcrew raises such serious concerns that the Safety Board believes the FAA should take immediate action to remedy.

In addition to investigative work at the accident site, Safety Board investigators conducted interviews at the Atlantic City FIAO, at the FAA Flight Standards District Office Certificate Management Office in Fort Worth, Texas, and at the unit headquarters, the Office of Aviation System Standards (AVN) in Oklahoma City, Oklahoma.

Investigators also obtained from the FAA, a System Safety Survey, which was conducted in 1989 following a fatal accident on November 2, 1988, which involved N44, a Rockwell 1121A turbojet airplane operated by the Atlantic City FIAO.[2] The survey was conducted at the request of AVN and the Associate Administrator for Aviation Standards and utilized Flight Standards Service (AFS) operations inspectors. The survey cited numerous (409) operational and maintenance observations and highlighted the need to increase emphasis on the safe

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[2]For more detailed information, read Aircraft Accident Brief--NTSB File No. 1059, case MIA89MA023, Oak Grove, PA

operation of FAA aircraft. AVN stated that as a result of the survey, it requested assistance from AFS in the development and surveillance of the FAA flight program.

AVN stated in November 1990, in FAA Notice 4040.36, that FAA aircraft would be operated and maintained in compliance with applicable Federal Aviation Regulations (FARs) to ensure a level of safety equivalent to that of the aviation industry. The Notice went on to state that FAA aircraft "shall be operated in compliance with Parts 91, 121 and 135 of the FAR."

One year later, AVN stated in FAA Order 4040.23 that its aircraft were to be certificated, operated, and maintained in accordance with the FARs. However, in that Order, the Director of AVN retained the right to determine "applicable regulations." Manuals for flight inspection operations and maintenance activities (training was not included) were developed through the cooperative efforts of AVN and AFS personnel. Again, however, the Director of AVN retained the authority to determine final acceptability of the manuals and subsequent revisions.

According to AFS personnel, Operations Specifications have not been published for FAA flying activities. An implementation schedule and final date for compliance with an oversight and surveillance program has not been established by AVN, AFS, or other senior FAA authorities. A positive method to resolve deficiencies or enforcement/disciplinary action suitable to AFS is not in place. Required National Flight Standards Program Work Functions (FAA Order 1800.132) activity in accordance with required surveillance in the Program Tracking and Reporting System 14 CFR for a Part 135 commercial operator is not established for FAA flying activity and traditional surveillance by Flight Standards field office inspectors did not exist at the time of the accident.

During interviews at the Atlantic City FIAO, investigators were told by other crewmembers that the pilot-in-command (PIC) involved in the accident had demonstrated poor judgment on previous flights. He reportedly:

Continued on a visual flight rules (VFR) positioning flight into IMC,

Performed a "below glidepath check" in IMC when VMC conditions were required by FIAO requirements,

Conducted VFR flight below clouds at less than 1000 feet above the ground in marginal weather conditions,

Replied to an ATC query that the flight was in VMC when it was in IMC,
Conducted departures without the second-in-command's (SIC) knowledge of essential flight planning information, i.e., IFR/VFR/en route filing/weather briefing/ultimate destination or routing,

Departed on positioning flights without obtaining weather information or filing an appropriate flight plan, and

Refused to answer an SIC query regarding their violation of VFR requirements. A complaint was brought forward to the Flight Operations/Scheduling Supervisor (FO/SS) for management resolution of this matter; however, no action was taken. Those interviewed indicated that other complaints were handled in a similar manner.

Investigators reviewed the AVN Flight Inspection Operations Manual in an effort to better understand the organization. They found that an Assistant Manager position was authorized at each FIAO. The position description included the responsibility to hear and resolve complaints and grievances. The Assistant Manager positions at the FIAOs have not been staffed. At Atlantic City, the FO/SS resolved complaints and grievances as part of his responsibilities for effective operations, standardization, and regulatory compliance. Investigators learned of numerous deficiencies that were brought to the attention of the FO/SS. These issues and complaints were reportedly not resolved nor brought to the attention of the Manager. Moreover, it appears that conflicts between crewmembers resulted in preferential scheduling by the FO/SS to ensure that the PIC involved in the accident under investigation flew only with SICs who were tolerant of his behavior. Lack of action by the FO/SS reportedly discouraged crewmembers from further expressing concerns or complaints or reporting additional incidents.

The organizational structure of each FIAO provides one supervisor for the PIC pilots and electronic technicians (ET) and a separate supervisor for the SICs. This organizational structure provided an atmosphere that resulted in a breakdown of the professional aircrew concept. An SIC supervisor stated that when the current organization was put in place, it immediately became, "us and them, PIC versus SIC." Investigators learned that the SIC, by virtue of his job description and responsibilities, is a secondary participant in the FIAO flight mission. Flight assignments for SICs were normally spaced four to five weeks apart. SIC flight time was about one third of that accomplished by the PICs. The PIC role is perceived, and functioned at unit level, to extend well past the flight operation and

into administrative supervision including appraisals, promotions, upgrade potential, and reassignments.

During FIAO interviews, one unit supervisor stated that, "Cockpit Resource Management (CRM) is nonexistent." The FIAO Manager indicated that, although CRM training had been initiated at some time in the past, lack of funding caused it to be incomplete. He stated that there was no active CRM program at the FIAO. When the AVN staff was queried about CRM, investigators were informed that a program suitable to the needs of the FIAO mission was in the early stages of development.

The AVN organizational structure has a Senior Flight Safety Officer position at the headquarters. The position is filled by a qualified individual with a flight operations inspector background. There are also additional duty Flight Safety Officer positions at each FIAO. Although the responsibilities of incident and accident investigation are part of the flight safety function, AVN did not make these individuals part of the Safety Board's investigation of this accident. Instead, AVN and the Atlantic City FIAO each provided an individual with ET experience (non-pilot background) to assist in the investigation.

Preliminary investigative findings indicate that, although there are many elements of change within AVN, some of the negative management and organizational flight safety observations identified in the 1989 System Safety Survey were still present at the time of the accident on October 26, 1993. Shortcomings were acknowledged by AVN upon receipt of the survey; however, sufficient and timely corrective actions were not implemented.

The Safety Board is concerned that the basic elements of flight operations and flight safety management that the FAA expects of air carrier and commuter operators are not presently established in the FIAO flight operations mission. The Safety Board is further concerned that these same basic elements of flight operations safety management may not be present in the other FAA regional and headquarters units that conduct flight operations utilizing over 55 public-owned aircraft and a variety of leased assets. The Safety Board believes that timely corrective actions are necessary to ensure that flying missions of AVN operate at a level of safety equivalent to that of the aviation industry.

Therefore, as a result of the investigation of this accident, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Require all Office of Aviation System Standards flight operations to file flight plans for all flights and to activate Instrument Flight Rules flight plans before takeoff to the maximum extent possible. (Class I, Urgent Action) (A-93-161)

Direct the Office of Aviation System Standards to evaluate the use of a Flight Dispatch program to assist in the management of FAA flight operations. (Class II, Priority Action) (A-93-162)

Institute Cockpit Resource Management Training, as outlined in FAA Advisory Circular 120-51 at each Office of Aviation System Standards flight operations unit. (Class II, Priority Action) (A-93-163)

Incorporate Aeronautical Decision Making techniques and skills as presented in FAA Advisory Circular 60-22 into the Office of Aviation System Standards aircrew training program. (Class II, Priority Action) (A-93-164)

Direct the Office of Aviation System Standards to evaluate the recommendations in the 1989 System Safety Survey relating to the second-in-command responsibilities and flying proficiency and to establish duties as appropriate. (Class II, Priority Action) (A-93-165)

Direct the Office of Aviation System Standards to implement an appropriate management/supervisor structure to ensure that a method of resolving conflicts, grievances, and incident reporting exists at the appropriate management level in each Flight Inspection Area Office. (Class II, Priority Action) (A-93-166).

Direct the Office of Aviation System Standards to elevate the Flight Safety Program requirements and the Senior Flight Safety Officer (SFSO) position within the organization to receive the level of attention presented in the responsibilities stated in the Flight Inspection Operations Manual and FAA Order 4040.9D, i.e., direct coordination between the SFSO and the Director of the Office of Aviation System Standards (as identified in the 1989 System Safety Survey). (Class II, Priority Action) (A-93-167)

Direct the Office of Aviation System Standards and Flight Standards Service (or the Associate Administrator for Aviation Standards and the Associate Administrator for Regulation and Certification) to negotiate and implement, by an established date, a surveillance system for FAA flight operations that is at least equal to that of the air carrier industry as previously agreed to in 1990. (Class II, Priority Action) (A-93-168)

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HAMMERSCHMIDT, and HALL concurred in these recommendations.

John A. Hammerschmidt for

By: Carl W. Vogt
Chairman

U.S. Department of Transportation
Federal Aviation Administration

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

JAN 31 1994

The Honorable Carl W. Vogt
Chairman, National Transportation
Safety Board
490 L'Enfant Plaza East, SW.
Washington, DC 20594

Dear Mr. Chairman:

This is in response to Safety Recommendations A-93-161 through -168 issued by the Board on November 24, 1993. These safety recommendations were issued as a result of the Board's investigation of an accident on October 26, 1993, involving a Beech Super King Air 300/F, N82, owned by the Federal Aviation Administration (FAA) and operated by the Flight Inspection Area Office (FIAO) at Atlantic City, New Jersey. The airplane was destroyed due to an in-flight collision with terrain near Front Royal, Virginia. The airplane had departed the nearby Winchester Regional Airport in visual meteorological conditions. However, witnesses indicated that instrument meteorological conditions prevailed at the accident site, which was 15 miles from the departure airfield. An instrument flight rules (IFR) flight plan to Newport News, Virginia, was on file in the air traffic control system, but the flight plan had not yet been activated. The flight was operating under the provisions of 14 CFR Part 91. All three crewmembers received fatal injuries.

A-93-161. Require all Office of Aviation System Standards flight operations to file flight plans for all flights and to activate Instrument Flight Rules flight plans before takeoff to the maximum extent possible.

FAA Comment. The FAA agrees with this safety recommendation. Flight operations manuals, which establish procedures for the Office of Aviation System Standards (AVN) flight operations, require that flight plans be filed for each operation. To underscore this requirement and to comply fully with the intent of this safety recommendation, an urgent change was issued on November 24, 1993, to all flight operations manuals that specified that IFR flight plans be used to the maximum extent possible. Some portions of the flight inspection cannot be performed while on an IFR flight plan because the checks

require flights at low altitudes and at different positions around a navigation facility. When an IFR flight plan is not possible for the flight inspection mission, a visual flight plan must be filed and used. The operations manual change also requires the use of air traffic control flight following and, when on the ground, the use of voice communications to secure an IFR clearance before becoming airborne. I have enclosed a copy of the operations manual change for the Board's information.

I consider the FAA's action to be completed on this safety recommendation.

A-93-162. Direct the Office of Aviation System Standards to evaluate the use of a Flight Dispatch program to assist in the management of FAA flight operations.

FAA Comment. The FAA agrees with this safety recommendation. Currently, AVN has a centralized scheduling proposal in the draft AVN Future Requirements Study that is under review. The initiative has many features contained in a formal flight dispatch program. Modification of the initiative would be accomplished to bring it more in line with a flight dispatch program comparable to those found in industry. The plan is to make the modifications and conduct a proof of concept for the centralized scheduling initiative beginning in May 1994 for 1 year.

I will keep the Board apprised of the FAA's progress on this safety recommendation.

A-93-163. Institute Cockpit Resource Management Training, as outlined in FAA Advisory Circular 120-51 at each Office of Aviation System Standards flight operations unit.

A-93-164. Incorporate Aeronautical Decision Making techniques and skills as presented in FAA Advisory Circular 60-22 into the Office of Aviation System Standards aircrew training program.

FAA Comment. The FAA agrees with these safety recommendations. Training for cockpit resource management (CRM) and aeronautical decisionmaking (ADM) techniques, as presented in the referenced advisory circulars, is being developed by the FAA in concert with the Civil Aeromedical Institute (CAMI) and industry. A prototype course will be conducted in February 1994 with final implementation in March 1994. The results of this program will be implemented at each AVN flight operations unit and in the AVN aircrew training program.

The CRM and ADM programs will be professionally facilitated with CAMI participation and will be conducted for all crewmembers. The training will include interpersonal

relations, conflict resolution, and emphasis on processes to be used to alert managers and supervisors of problem situations.

A quality action team has been established to take a broad look at the implication of safety, standardization, and training in the FAA aircraft program. Efforts of this team will result in a plan to be developed by January 31, 1994.

In the interim, managers of FAA flight programs met with all flight crewmembers regarding CRM's responsibilities during the standdown completed the week of November 15, 1993. The role of CRM in AVN flight operations, ADM techniques, and the facts of the N82 accident were topics at the November standdown and are regular discussion topics at safety briefings for all flightcrews.

I will keep the Board apprised of the FAA's progress on these safety recommendations.

A-93-165. Direct the Office of Aviation System Standards to evaluate the recommendations in the 1989 System Safety Survey relating to the second-in-command responsibilities and flying proficiency and to establish duties as appropriate.

FAA Comment. The FAA agrees with this safety recommendation. This proposal is included in the draft AVN Future Requirements Study that is under review. Under the proposal, the procedures development duties would be removed from the second-in-command (SIC) position description and SIC duties would focus on flying responsibilities. Procedures development would be centralized.

I will keep the Board apprised of the FAA's progress on this safety recommendation.

A-93-166. Direct the Office of Aviation System Standards to implement an appropriate management/supervisor structure to ensure that a method of resolving conflicts, grievances, and incident reporting exists at the appropriate management level in each Flight Inspection Area Office.

FAA Comment. The FAA agrees with this safety recommendation and is changing the organizational structure of the FIAO to establish a more unified management structure. The FIAO management reorganization will be initiated by January 31, 1994. Under the new organizational structure, pilots-in-command and SIC's will be assigned to the same unit with the same supervisor.

The new FIAO organizational structure will reflect strong and effective management of the mission and resources of each office. Additionally, the events which preceded the N82

accident and the breakdown in both communication and management effectiveness have been subjects of formal discussions with FIAO managers. The FIAO managers and supervisors are very familiar with the problems which became apparent as a result of the accident investigation and are committed to ensuring that these circumstances will not recur at any FIAO. Finally, management effectiveness will be enhanced through a series of formal professionally-facilitated programs at each FIAO that will focus on interpersonal relations and conflict resolution.

I consider the FAA's action to be completed on this safety recommendation.

A-93-167. Direct the Office of Aviation System Standards to elevate the Flight Safety Program requirements and the Senior Flight Safety Officer (SFSO) position within the organization to receive the level of attention presented in the responsibilities stated in the Flight Inspection Operations Manual and FAA Order 4040.9D, i.e., direct coordination between the SFSO and the Director of the Office of Aviation System Standards (as identified in the 1989 System Safety Survey).

FAA Comment. The FAA completed action on November 28, 1993, to address this safety recommendation. The senior flight safety officer was reassigned to report directly to the Director of Aviation System Standards. This organizational change elevated the flight safety program within AVN so that the program receives full support of senior management in AVN and at all other levels within the FIAO.

I consider the FAA's action to be completed on this safety recommendation.

A-93-168. Direct the Office of Aviation System Standards and Flight Standards Service (or the Associate Administrator for Aviation Standards and the Associate Administrator for Regulation and Certification) to negotiate and implement, by an established date, a surveillance system for FAA flight operations that is at least equal to that of the air carrier industry as previously agreed to in 1990.

FAA Comment. The FAA agrees with this safety recommendation. Flight Standards Service and AVN have started an initiative which will establish a surveillance system for FAA flight operations that is at least equal to that of the air carrier industry. The requirements for the program are established in FAA Order 4040.24, Operational Standards for FAA Aircraft. I have enclosed a copy of the order for the Board's information.

I will keep the Board apprised of the FAA's progress on this safety recommendation.

Sincerely,

David R. Hinson
Administrator

Enclosures

U.S. Department of Transportation

Federal Aviation Administration

Memorandum

Subject: INFORMATION: Operations Manual URGENT Change

Date: NOV 24 1993

Reply to Attn. of:

From: Director of Aviation System Standards, AVN-1

To: Manager, Washington Flight Program Staff, AVS-60
Manager, Airspace System Assurance Division, AVN-800
Manager, Regulatory Standards and Compliance Division, AMA-200
Manager, Flight Standards Division, ACE-200
Manager, Research and Development Aircraft and Range Facilities Division, ACN-700

In accordance with all Flight Program Operations Manuals, Chapter V, regarding flight plans, this is an urgent change and will be implemented immediately for TI 4040.50, TI 4040.55, TI 4040.60, TI 4040.70, and TI 4040.75.

Flight Plans

Instrument Flight Rules (IFR) flight plans shall be filed and used to the maximum extent possible for all flights. In those instances where mission accomplishment will be adversely impacted by the use of IFR flight plans, a Visual Flight Rules (VFR) flight plan shall be filed. When operating VFR, ATC flight following will be used where available. When on the ground, and voice communications are available with an air traffic facility, IFR flight clearances shall be secured prior to becoming airborne. In the absence of available communications, and while on the ground and able to operate in visual meteorological conditions (VMC), it is permissible to obtain IFR clearances after becoming airborne.

A copy of this memorandum will be inserted in each manual until the next formal revision. This urgent change will be included in the next revision to operations manuals for each respective FAA flight program entity, no later than March 31, 1994.

ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

4040.24

12/22/93

ADVANCE COPY

SUBJ: **OPERATIONAL STANDARDS FOR FAA AIRCRAFT**

1. PURPOSE. This order establishes FAA policy and procedures for assuring that FAA aircraft are operated at the highest levels of safety.

2. DISTRIBUTION. This order is distributed to division level in Washington headquarters, regions, and centers; to the branch level in Flight Standards Service, the Office of Aviation System Standards, the Aircraft Certification Service, and the FAA Academy; to division level at the Mike Monroney Aeronautical Center, the FAA Technical Center; to branch level in the FAA Technical Center R&D Aircraft and Range Facilities Division; to all Flight Standards and Aircraft Certification field offices; and all Flight Inspection Area Offices and International Flight Inspection Offices.

3. BACKGROUND. The FAA has statutory responsibility for prescribing standards, rules, and regulations and the responsibility for issuing air carrier certificates. In addition, the FAA has statutory responsibility to maintain a safe, common system for the use of airspace and the operation of aircraft. To effect a safe transportation system, the FAA operates a fleet of specially equipped aircraft. The Director, Flight Standards Service, AFS-1, is responsible for the certification and surveillance of air carrier and commercial operators, which includes the approval and surveillance of aircraft maintenance programs and airman training programs that comply with air carrier regulatory requirements. The Director of Aviation System Standards, AVN-1, is responsible for the management and operation of FAA aircraft.

4. CERTIFICATION, OPERATION, AND MAINTENANCE OF FAA AIRCRAFT. The Director of Aviation System Standards shall ensure that the FAA aircraft program is "certificated" and operated, and the aircraft maintained in accordance with air carrier regulations that would be applicable if the "FAA aircraft program" were an air carrier. Exemptions and deviations from regulatory requirements will be approved by the Director, Flight Standards Service.

a. Policies and procedures developed in accordance with regulatory requirements shall be submitted by AVN to the assigned

Distribution: A-W(minus FS/VN/IR)-2;A-W(FS/VN/IR)-3; A-XZ-2;A-Y(minus AY)-2;A-Y(AY)-3; A-FAC/FFS-0 (STD); ACN-300 (10 copies); AMA-200 (80 copies)

Initiated By: AFS-1

Flight Standards certificate holding district office (CHDO) for approval/acceptance prior to implementation. Appropriate guidance for operating at the highest standards of safety will be provided by the CHDO.

b. The Director, Flight Standards Service, is responsible for providing a surveillance and inspection program equal to that of an equivalent air carrier operation.

c. The Director of Aviation System Standards is responsible for appropriate corrective action when program deficiencies and potential areas of noncompliance are identified through the inspection and surveillance program.

David R. Hinson
Administrator

APPENDIX E

MEMORANDUM FROM DFW CMO TO AFS-1

Memorandum

U.S. Department
of Transportation

**Federal Aviation
Administration**

Subject: INFORMATION: Monthly Update - October 1993
FAA Flight Programs

Date: October 22, 1993

From: Manager, DFW Certificate Management Office

Reply to
Attn. of: Daniel:5922

To: Director, Flight Standards Service, AFS-1
Through Manager, Flight Standards Division, ASW 200

KEY ISSUES

1. **AVN self-audit program**. In an October 14, 1993, telecon with AVN 500, the status of the AVN self-audit program was discussed. AVN 520 had originally planned to accomplish one self audit inspection per month. AVN now believes that it would be unjust to perform the audits before the particular entity has had the opportunity to view the Regional Flight Training Video. AVN has now indicated that the Training Video will not be completed and shipped until the end of October. Consequently, AVN has canceled the remaining three audits for calendar year 93 and has informed the DFW CMO they will publish a new schedule.

2. **AVN Training Programs.** As indicated above, the AVN Regional Flight Training Video should be completed and shipped within the next two weeks. Personnel from the DFW CMO are scheduled to meet with AVN 520 on November 3, 1993, to update training milestones for all FAA Flight Program Participants.

3. **AVN response to PTRS activities.** On September 23, 1993, AVN requested their deadline to respond to certain significant PTRS comments be extended from 30 September to 8 October. During the October 14 telecon they informed the DFW CMO that their response would not be completed for at least another week. The DFW CMO has been forwarding potentially significant PTRS findings to AVN since February and has thus far received few responses. It is evident that AVN remains opposed to providing the DFW CMO with the feedback requested. The DFW CMO believes the feedback is essential in order to validate the Flight Standards surveillance activities and close the loop with the reporting FSDOs.

4. AVN Deice & Anti-Icing Program. By AVN's own admission during the October 14 telecon, their existing deicing procedures are not adequate to meet Part 121.629 requirements. At that time, they informed the DFW CMO that they did not intend to meet Part 121 requirements. Following that, the Part 135 Deicing/Anti-Icing NPRM was discussed with AVN. AVN informed the DFW CMO that they will comply with Part 135 which has a proposed effective date of 1 December, 1993.

5. Overhaul Interval Extensions and AVN General Maintenance Manual (GMM). Recently, it came to the DFW CMO's attention that AVN had authorized short term escalation for certain items having time limitations. The latest instance involved extending the overhaul period on a Hartzel propeller beyond that recommended by the manufacturer. When questioned as to under what authority the extensions were granted, AVN admitted that at present, they had no such approved means of doing so, however, mission requirements dictated the decision. They indicated that such procedures will be contained in Revision 4 of the GMM, which is now scheduled to be published and disseminated by the first of November.

At present, AVN has not responded to the DFW CMO's comments on Revisions 1, 2, or 3 of the GMM. The DFW CMO has been told that Revision 4 will address all such previous comments as well as AVN's response to DFW CMO letter dated October 11, 1991, regarding compliance to aging aircraft airworthiness directives and AVN's proposal for continuous authorization to conduct ferry flights. While the DFW CMO is scheduled to receive a copy of the GMM just prior to its implementation, Order 8300.10, Bulletin FSAW 92-42 clearly indicates that manuals, programs, and revisions are to be coordinated between AVN and the DFW CMO for *review, comment and concurrence before implementation.*

6. AVN Regulatory Review. During the September 13, telecon, AVN expressed their desire to perform a new regulatory review based on the current capabilities of their organization. The review would lead to a revised delineation of those FARs, with which AVN could comply. AVN has completed their review and has composed a Letter of Compliance to address the issue. The DFW CMO is scheduled to receive the letter by the end of October. Discussions indicate that AVN will primarily comply with Part 135 requirements.

The process by which the regulatory review was performed has raised some questions. Order 8300.10, Bulletin FSAW 92-42, established the policy that if the FAR were amended, regulatory reviews would be conducted by AVN with participation by the DFW CMO. With that as a basis, the intent would appear to be the same for any regulatory review. However, in this instance, the DFW CMO was not asked, nor did they participate in the review.

FLIGHT STANDARDS SURVEILLANCE

1. A recent PTRS report from the Anchorage FSDO conveyed a notable misconception among key Flight Inspection individuals. Specifically, a Flight Standards geographic Inspector was informed by the supervisory and maintenance personnel at the ANC FIFO that it was their belief that compliance with the AVN General Maintenance Manual was only optional. AVN informed the DFW CMO they would follow up on the report and correct the misconception.

2. PTRS records summary for:

RU3A - Flight Inspection Program
UA2A - Regional Flight Program
PI1A - AVS 60 Flight Program
LI2A - AVN Tech Center Program

ACCUMULATED PTRS ACTIVITIES FY 1993

RU3A		UA2A		PI1A		LI2A	
C	69	C	5	C	9	C	4
S	25	S	10	S	22	S	0
F	8	F	3	F	0	F	10
I	34	I	8	I	1	I	10
X	9	X	0	X	0	X	0
P	23	P	3	P	0	P	0
O	4	O	1	O	0	O	4
A	3	A	0	A	0	A	0
T	2	T	0	T	0	T	0
E	0	E	0	E	0	E	0

PTRS ACTIVITIES August 12 - September 15, 1993

RU3A		UA2A		PI1A		LI2A	
C	8	C	1	C	0	C	2
S	1	S	3	S	2	S	0
F	1	F	0	F	0	F	1
I	2	I	1	I	0	I	0
X	0	X	0	X	0	X	0
E	0	E	0	E	0	E	0

FLIGHT STANDARDS LABOR HOURS EXPENDED

ACCUMULATED LABOR HOURS FY 1993

RU3A	659.3 hours
UA2A	51.0 hours
LI2A	149.7 hours
PI1A	60.5 hours

Note: The majority of PTRS records do not reflect Flight Standards activity time spent in conjunction with FAA Flight Program development, technical assistance, or surveillance.

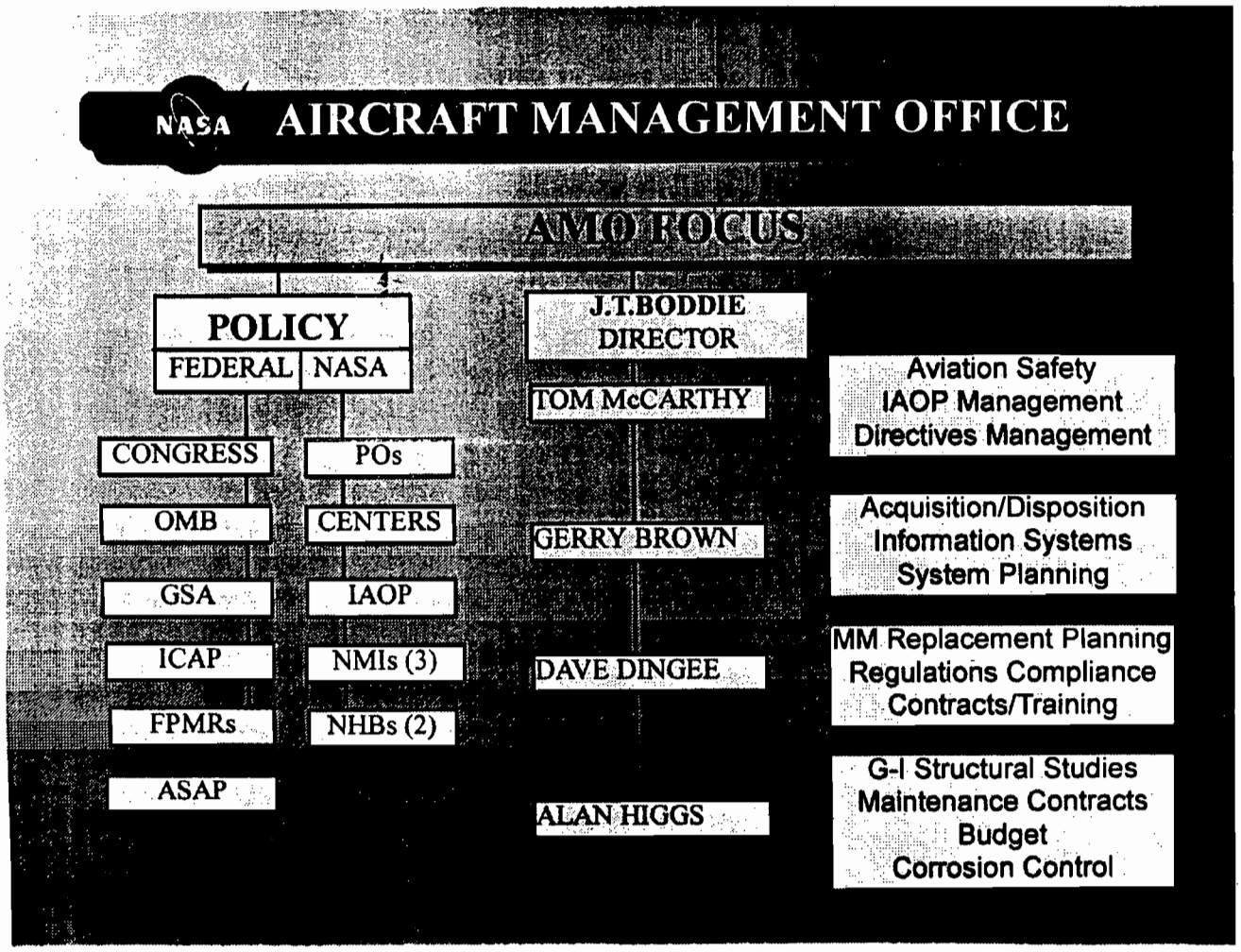
Please advise the DFW Certificate Management Office if there are any questions.

Walter M. Ernst, Jr.

Walter M. Ernst, Jr.

APPENDIX F

NASA AIRCRAFT MANAGEMENT OFFICE INFORMATION



AIRCRAFT MANAGEMENT OFFICE

Specific Duties and Responsibilities

Responsible for the safe operation of NASA's aviation assets and ensures that current policies and directives are disseminated to all aviation activities controlled by NASA

Responsible for management and development of policy for the effective acquisition and application of NASA aircraft resources for research and development, program support and mission management

Coordinates the review, technical assistance and evaluation of proposed acquisitions, classifications, assignments and disposition of NASA aircraft with Program Offices and Field Installations

Manages the development and issuance of Agency guidelines governing operations, maintenance and training activities for all NASA controlled aircraft

Manages internal and external Program/Policy Issues involving key National and Agency-wide goals

Maintains liaison with other Governmental Agencies and the private sector on matters pertaining to aircraft operations, maintenance and management practices

AIRCRAFT MANAGEMENT OFFICE

AIRCRAFT MANAGEMENT OFFICE

Aircraft Inventory

ARC	DFRC	JSC	LaRC	LeRC	GSFC/WFF
ER-2(3)	X-31 (2)	T-38 (29)	Lear 28/29	DC-9	T-39 (2)
NC-130	SR-71 (3)	G-II STA-5	OV-10	DHC-6	P-3B
C-141	F-15 (3)	B747 SCA-2	B737	OV-10	C-130
DC-8	F-16 (3)	KC-135	AC-680	Lear 25	L-188
Lear 24	F/TF-18 (8)	B-57F	F-16	G-1	Skyvan
XV-15	F-104 (2)	G-I	T-38		UH-1H
AV-8 (2)	T-38		BE-80		BE-200
UH-60 (3)	CV-990		UH-1H		
NAH-1S	B-52			**SSC**	
UH-1H	PA-30			Lear 23	
SH-3G	PIK-20				
BE-200		**MSFC**	**JPL**	**KSC**	**HQ/DCA**
		B-200	BE-200	UH-1H (4)	G-III
		G-I		G-I	

R & D	**= 47**
PS/Astronaut Training	**= 60**
Mission Management	**= 08**
Total	**= 115**

CHAPTER 5 - AVIATION SAFETY

500. POLICY

1. NASA will take all practical and necessary steps to avoid the loss of life, personal injury, property loss, mission failure, or test failure. Accordingly, Field Installations will support and maintain a well-defined aviation safety program and organization in accordance with established guidelines. The aviation safety program will be formalized and implemented by safety professionals, who will provide timely monitoring, surveillance, and support. The safety program will address requirements of the aviation ground environment, flight environment, and programmatic mission environment.

2. Aviation safety is a line management responsibility. Consequently, managers at all levels have a direct responsibility for the safe conduct of aircraft operations under their control. All aviation safety-related contracts will require compliance with these guidelines.

3. This Chapter provides information concerning NASA's aviation safety program. Mishap prevention in NASA is based upon the philosophy that mishaps can be prevented and that mishap prevention is an inherent function of leadership and management. NASA's major involvement in aeronautics dictates a major involvement in aviation safety, not only under the aviation safety program, but under technology programs as well.

501. AVIATION SAFETY RESPONSIBILITIES

To ensure effective implementation, an aviation safety program shall conform to the organization's aviation management structure and is applicable Agencywide. To clarify the program, the NASA aviation management structure and safety responsibilities/functions are outlined below.

1. The Administrator is responsible for Agencywide safety.

2. The Associate Administrator for Safety and Mission Quality (SMQ) establishes aviation safety program requirements, and provides independent oversight of NASA aviation safety. He/she shall provide the NASA Administrator an independent assessment of NASA's

aviation safety status and provide immediate information on critical safety issues. The Office is also responsible for a system assurance program that provides focus to those activities that will enhance operational success of NASA programs and/or projects. They will ensure that SMQ policies, plans, procedures, and standards are established, documented, maintained, communicated, and implemented. They will review safety practices and standards and their application to programs/projects and will conduct independent reviews of programs and programmatic controls within NASA and within the contractor structure. They will ensure the prompt, thorough, and accurate reporting, investigation, and analysis of all NASA mishaps.

3. The Director, Safety Division, is the Headquarters focal point for aviation safety oversight.

   a. He/she provides overall aviation safety oversight and NASA Headquarters management support for aviation safety. Through this independent oversight function, the Director shall ensure that aviation safety program elements are being applied at the appropriate levels of responsibility throughout NASA.

   b. The Director shall provide aviation safety oversight and support through the following functions:

      (1) Providing systems safety oversight to ensure Headquarters and Field Installation aircraft operations comply with NASA safety policy.

      (2) Coordinating all Safety and Mission Quality (Code Q) requirements affecting aviation safety or reporting.

      (3) Ensuring there is an effective Agency mishap and incident reporting and corrective action system.

      (4) Identifying aviation safety issues through mishap analysis.

      (5) Assigning an Aviation Safety Officer (ASO) ex-officio board member to major aircraft mishap investigations.

      (6) Participation in the Aircraft Management Office's (AMO) annual NASA ASO meeting.

(7) Attending selected program flight readiness and safety reviews.

(8) Providing an advisor to the IAOP who shall participate in IAOP activities, including the IAOP meetings, reviews, and subpanel activities.

(9) Monitoring and acting on the aviation safety needs of the Headquarters Program Offices, AMO, and Field Installations.

(10) Providing an ASO to be the Agency independent focal point for aviation safety issues.

(11) Conducting aviation safety staff visits and reviews.

(12) Coordinating recommendations from mishap investigations that require corrective action from sources or agencies outside of NASA.

(13) Interfacing with other safety organizations.

(14) Advocating aviation safety research.

4. The Associate Administrator for Management Systems and Facilities in accordance with NMI 7900.1, is responsible for Agencywide policies and other matters related to NASA aircraft management. He/she will provide direction to the AMO in their coordinating role with NASA Field Installations and the IAOP.

5. The Aircraft Management Office (AMO) is responsible for establishing an Agencywide Aviation Safety Program in accordance with Agency policies. They will work with the IAOP, the Safety Division, and relevant Headquarters Program Offices to ensure that aviation safety program elements are developed and promulgated. The Chief, AMO, is the Headquarters focal point for Agencywide aircraft operations and management. The AMO will ensure NASA-wide compliance with the aviation safety program by meeting the following requirements/functions as appropriate:

NOTE

a. Designating an ASO within the AMO to assist in integrating safety into all activities.

b. Establishing NASA Aviation Safety Policy guidelines for research and development, program support, and mission management aircraft operations.

c. Including the assessment of aviation safety programs in coordinating and managing the periodic intercenter aircraft operations reviews of NASA Field Installations. The results of the reviews are briefed to the head of the appropriate Headquarters office, and the final report is co-signed by the Manager, Flight Safety.

d. Conducting an annual NASA ASO meeting to ensure integration of safety into NASA aircraft operations policies and procedures.

e. Providing guidance on the operational safety aspects of NASA aircraft acquisitions.

f. Attending selected program flight readiness and safety reviews.

g. Participating in selected flight operations and related activities.

h. Interfacing with other aviation safety organizations.

i. Participating in selected investigations of aircraft mishaps.

j. Ensuring that recommendations and lessons learned from mishap investigations that have NASA-wide implications are coordinated and implemented.

6. The Program Offices with aircraft assets have line management responsibility for aviation safety and will ensure implementation of aviation safety programs for their respective Field Installations. This responsibility applies to allocation of aviation resources to meet objectives and program goals safely, promulgate safety awareness, conduct mishap investigations, and develop corrective actions.

a. The Associate Administrators for Space Science and Applications (Code S); Aeronautics and Space Technology (Code R); Space Flight (Code M); and Management Systems and Facilities (Code J) have line management responsibility for aviation safety for their respective Field Installations or flight

operation. This responsibility applies to allocation of aviation resources to meet objectives/programs safely, promulgate safety awareness, conduct mishap investigations, and develop/implement corrective action.

b. A senior, single point of contact for aviation safety and aircraft operations management shall be designated within each Program Office to provide a focus with the Office of Safety and Mission Quality and the Office of Management Systems and Facilities for all aviation safety and aircraft related matters.

c. The Associate Administrator for Aeronautics and Space Technology (Code R) manages aviation safety-related technology and research programs.

7. The Aerospace Safety Advisory Panel (ASAP) was established as an advisory committee to NASA by Section 6 of the NASA Authorization Act, 1968 (P.L. 90-67, codified as 42 U.S.C. 2477). The panel reviews and evaluates program activities, systems, procedures, and management policies and provides assessment of these areas to NASA management and Congress. It is in this role that the panel provides independent advice on NASA aviation safety-related issues to the Associate Administrator for Safety and Mission Quality and to the Administrator.

8. Field Organizations and Personnel

a. Field Installation Directors. The Installation Director is the primary NASA official responsible for ensuring the safe operation of all aircraft assigned to the Field Installation, and for establishing and implementing an Aviation Safety Program. The Director is responsible for determining airworthiness and flight readiness review requirements, establishing operating procedures, and for ensuring that the flight objectives satisfy the programmatic requirements. The Directors accomplish these tasks by complying with NASA Headquarters directives and through the use of their aviation managers, staffs, and ASO's. They are assisted by NASA Headquarters staff visits and reports and recommendations of the IAOP and ASAP.

b. Installation Aviation Manager of Flight Operations. The Aviation Manager is the senior

line person assigned aircraft operations responsibilities. The manager depends on the ASO to identify mishap potentials and assist in administering the mishap prevention program. However, the manager can not delegate the line responsibility for the prevention of mishaps. A manager's experience, leadership, and philosophy are decisive factors in ensuring safe operations.

c. Pilot-in-Command

(1) The NASA aircraft Pilot-in-Command (PIC) is responsible at all times for the safe operation of the aircraft and the safety of the passengers, and shall be the final authority as to whether a flight shall be delayed or diverted for reasons of weather, aircraft conditions, or other safety-related considerations.

(2) The PIC shall ensure that passenger briefings are conducted and include pertinent egress, safety, and emergency information.

d. Individuals. All personnel, including contract personnel associated with NASA flight operations, shall conduct aviation-related activities in a safe and responsible manner and in compliance with NASA aviation guidelines and safety programs. Contracts involving or affecting aviation operations shall stipulate compliance with aviation safety requirements. Aviation safety is a personal responsibility of every person involved in aviation-related activities.

9. All aviation supervisory personnel will ensure that activities include adequate safety provisions and emphasize the development of aviation safety enhancement techniques, standards, and procedures.

10. Each NASA employee will report potential or actual aircraft operations related hazards to the ASO who is responsible for prompt notification of the appropriate designated official.

502. AVIATION SAFETY OFFICER (ASO)

1. An ASO will be appointed at each appropriate Field Installation by the Center Director or designee. However, the ASO is authorized to take a safety issue

to a higher level of management as may be necessary. If possible, the ASO position should be a full-time responsibility, even though at most Field Installations the ASO also performs primary pilot duties. Since the ASO serves as the manager's focal point for aviation safety matters, the ASO should report directly to the senior aviation manager responsible for risk management. The ASO also acts on behalf of the Installation Director when discharging this responsibility. The ASO shall foster aviation safety measures and use all resources available to promote mishap prevention. ASO selection should be based on education, experience, and ability. This individual will be on flight status, current in assigned aircraft, and ideally should be a graduate of an approved aviation safety program, and have experience in aircraft mishap investigation.

2. The ASO will have a sufficiently adequate background in aviation and familiarity with the Field Installation and its aviation programs in order to implement and promote an effective safety program.

3. The ASO should attend a recognized aviation safety officer's or accident prevention course of at least two weeks duration, and should establish a continuing education program to ensure adequate knowledge to discharge the duties of the office.

503. AVIATION SAFETY PROGRAM

1. An aviation safety program is similar in concept to military and other successful aviation safety programs where each level of aviation management (or command) is responsible for the program. Under this concept, the Director/Aviation Manager responsible for aviation safety and risk management at each level is assisted by an ASO or safety advisor who is an integral part of the manager's staff and not part of a separate safety organization. The program is supported by system safety personnel as required. Reviews and staff visits by Headquarters safety personnel provide oversight and monitoring of management's effectiveness in aviation safety, and technical and operational assistance for improving the overall safety programs.

2. The highly diversified aviation activities within NASA require a tailored aviation safety program for each flight activity. Although aviation safety is everyone's business, the primary responsibility for each Field Installation's aviation safety program

rests firmly with the Center Director. In the case of the NASA Headquarters aviation operations, the primary responsibility for the aviation safety program rests firmly with the Associate Administrator for Management Systems and Facilities.

3. Each Field Installation will establish a documented aviation safety program. Appendix B lists several proven elements that could be included in a program. However, Field Installation aviation safety programs will, as a minimum, address the following areas:

   a. Risk assessment/hazard analysis.

   b. Mishap and near mid-air collision reporting and investigation.

   c. Project/program safety plans.

   d. Design reviews, aircraft configuration management, and flight and test readiness reviews.

   e. Training, education, and awareness.

   f. Aviation safety inspections/surveys.

   g. Hazard reporting and investigation.

504. INTERFACES WITH OTHER AGENCIES

NASA aviation activities interface with the aircraft industry, Department of Transportation (DOT), Federal Aviation Administration (FAA), the Department of Defense (DOD), and foreign governments. These resources shall be used fully in aviation safety matters.

1. Industry. Although this interface is normally through the contracting officer, special safety provisions in contracts should permit or require exchange of accident information concerning the types of aircraft involved. Safety personnel should participate in design reviews and inspections during the acquisition phase to ensure proper safety coverage.

2. Department of Transportation. NASA aviation safety has a direct interest in FAA flight services and facilities used by NASA aircraft. These include departure, enroute, and arrival procedures, and the airways, restricted airspace, and local flying/training areas. Cooperation with FAA at the local level should foster a mutual understanding in

developing safe aviation control procedures. Research and development activities present a real opportunity for NASA/FAA cooperation to enhance safety.

3. Department of Defense. Since NASA utilizes many military airfields and aircraft common to the military services, coordination with the Army, Navy, and Air Force is required. Use of the various service safety publications, cross-exchange of accident prevention data, and participation in joint safety efforts should provide mutual benefits. Safety and accident investigation provisions are included in joint agreements with DOD agencies for joint use or loan of aircraft.

4. Foreign Governments. Most foreign interface occurs during joint research of exchange programs and aviation displays. Aviation safety is keyed to saving lives and property and should not have political or national boundaries.