

Log 1986



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

**Date:** February 16, 1988

**In reply refer to:** A-88-20 through -23

Honorable T. Allan McArtor  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

On April 4, 1986, about 1922 c.s.t., an Israel Aircraft Industries IAI-1124A, Westwind II, N50SK, a twin-engine, eight-passenger, turbojet airplane, was destroyed when it impacted the ground at high speed in an uncontrolled descent near Redwater, Texas, following a loss of control at 37,000 feet. The two crewmembers and five passengers aboard were killed. An explosion on impact caused minor ground fires nearby. The airplane, owned by Drayton Associates and leased to and operated by the Singer Corporation-Kearfott Division, had departed Redbird Airport at 1856 c.s.t. under an instrument flight rules (IFR) flight plan on an executive flight from Dallas, Texas, to Teterboro, New Jersey. 1/

The flight departed Redbird Airport at 1856, cleared for the Dallas 4 Departure (standard instrument departure) to Texarkana VORTAC and then Jet Route J-42 at flight level 370, and was immediately handed off to Dallas/Fort Worth (DFW) Regional Departure. At 1900:35, the captain contacted the Terminal Radar Approach Control (TRACON) and stated, "Our radar is not doing very well this evening." He requested vectors around thunderstorms that were building up to the south and east of the airport. The TRACON controller provided the vectors and subsequently handed off the flight to the Fort Worth Air Route Traffic Control Center (ARTCC) Lake Low Sector controller. The TRACON controller did not pass on the information about the reported radar malfunction to the ARTCC controller when he handed off the flight. At 1902:26, the captain requested additional vectors for weather avoidance from the ARTCC controller, but did not state that their radar was malfunctioning. The captain did not inform any subsequent controllers of the radar malfunction. Neither the crew nor the TRACON controller was required by Federal Aviation Administration (FAA) regulations to report the radar outage or to notify other controllers of the malfunction.

With the exception of the vectors for weather avoidance, the flight progressed normally throughout the climb, and at 1910:14 the captain requested and received clearance to proceed "direct" to the Texarkana VORTAC. About 1917, the ARTCC controller requested a pilot report from the crew. The captain stated "well off to the left they're still building uh theres topping out about 38 39 but off to the right where we were just passing through there she's topping about 36 to 37." At 1918:57, the captain stated that they needed to maintain their current heading and requested permission to climb from the assigned altitude of 37,000 feet to 39,000 feet. The controller acknowledged

1/ For more detailed information, read Aircraft Accident Summary Report—"Israel Aircraft Industries IAI-1124A, N50SK, Operated by Singer Corporation-Kearfott Division, April 4, 1986, Redwater, Texas" (NTSB/AAR-88/01/SUM).

receipt of the request and about 60 seconds later, at 1919:51, a crewmember stated, "Center, Westwind fifty SK need to get up." Laboratory and operator analysis of the air traffic control (ATC) audio tapes revealed that these last two transmissions were made by the copilot, whereas all of the previous transmissions had been made by the captain. According to the operator's policy, the person not flying would make the radio calls. After coordinating the new altitude with the adjoining airspace controller, the ARTCC controller cleared the flight to flight level 390 at 1920:17 but did not receive an acknowledgment. A garbled transmission from N50SK was received at 1920:13. Transponder and altitude readouts were lost from the ARTCC radarscope at 1920:01 and primary returns were lost at 1922:07. Reconstruction of the ARTCC recorded radar data indicated that during the 30 seconds immediately before the loss of communications and radar contact, the airplane was tracking straight on a course of 083°, directly into an area of severe weather, and that the climb from FL 370 to FL 390 was not initiated. At the airplane's gross weight, its service ceiling was FL 410.

The airplane crashed in an open pasture on a heading of 275° in an 82° nose-down attitude with the left wing leading. The impact site was 4.1 miles northeast of the point where recorded radar data showed the last transponder encoded return. The airplane disintegrated on impact.

A review of the weather data by Safety Board meteorologists indicated that the area of the accident flight was dominated by a stationary front that ran from southwest Texas up through northern Arkansas. A review of the weather radar data indicated that at the time of N50SK's last radio transmission, the airplane was encircled by at least three storm cells located within 13 miles of the airplane's position that varied in intensity from VIP level 4 to VIP level 6. The core of the level 6 cell, with tops to 45,000 feet, was 7 miles northeast of the last recorded position of the airplane. The best information available indicated that the cells were still building at the time of the accident. However, the weather data review indicated that the airplane was in visual meteorological conditions (VMC) when the crew lost control, and that following the loss of control, the airplane penetrated the level 6 cell and descended through it. The airplane could have encountered severe airframe icing in the thunderstorm. The study also indicated that it would have been a dark, moonless night both at the cruise altitude and on the ground.

As the airplane was lifting off at Redbird Airport at 1856, the National Weather Service (NWS) National Aviation Weather Advisory Unit issued Convective SIGMET 2C, which covered the route of flight of N50SK. A review of the ATC transcripts determined that SIGMET 2C was not transmitted on any of the ATC frequencies while N50SK was on those frequencies. The Air Traffic Control Handbook, 7110.65E, requires that the text of a SIGMET be transmitted over all operational frequencies at least once when any part of the area described in the text is within 150 miles of the en route facility's jurisdiction. In addition, the handbook states that terminal facilities may transmit an abbreviated text if the area of coverage is within 50 miles of the facility. While the required transmission of SIGMET 2C may have been made over the appropriate frequencies, it was not made during the time that N50SK was maintaining an active listening watch. The handbook also requires that an active SIGMET and AWW be transmitted over the voice band of the affected VOR facilities at 15-minute intervals beginning at 15 minutes past the hour. The investigation revealed that the SIGMET and the AWW that were pertinent to the accident were not transmitted over the Texarkana VORTAC during the timeframe in question. The Safety Board realizes that traffic conditions could preclude the dissemination of this information by controllers every 15 minutes. However, the Board believes that the handbook should be amended to require the frequent broadcasting of the significant hazardous weather reports that are in effect.

The final transmissions from the airplane indicated that the crew was aware that they were in or about to be in a hazardous situation. Evidence indicated that the VIP level 6 thunderstorm was growing in front of them and they were going to attempt to climb over it. Shortly thereafter, the airplane apparently experienced a turbulence-related upset while in clear air as a result of the outflow of the level 6 storm cell. Following the upset, the airplane penetrated the cell and descended through it until it broke out of the bottom at approximately 4,000 feet agl. Research indicated that the crew probably would have had to attempt a recovery using partial control panel techniques. In addition, the severe airframe icing that is indicated by the Safety Board weather study would have adversely affected the flight characteristics and recoverability of the airplane.

The handling of the accident flight by DFW Regional Departure and Fort Worth ARTCC controllers was in accordance with the Air Traffic Control Handbook, 7110.65D. The ARTCC controller was aware of the possibly severe weather in the Texarkana area and briefed his relief on the storm cells in the area. However, he made no attempt to inform the crew of N50SK that they were heading into the severe weather, probably because of the crew's indications that they were providing their own weather avoidance and because he was not aware that the airplane's radar was malfunctioning, and the crew did not request assistance. The Safety Board believes that had the controller been aware of this radar outage, he would have provided additional assistance.

The Airman's Information Manual (AIM), Chapter 4, Section 7, Paragraph 342, Subparagraph (1)(h), advises pilots to inform ATC when they experience a loss or malfunction of certain navigational and communication equipment. The Safety Board believes that pilots should also report to ATC when they are aware of a loss or malfunction of the airplane's airborne weather radar equipment and that paragraph 342 should be expanded to include this type of report.

Additionally, the Air Traffic Control Handbook, 7110.65D, Section 2, Paragraph 2-7, directs controllers to determine the nature and extent of any special handling desired when a pilot reports an in-flight malfunction. The Safety Board believes this paragraph should be expanded to include a loss or malfunction of airborne weather radar. This information would be passed on to other controllers or facilities who would subsequently handle the aircraft.

The Safety Board is aware of the FAA's current Hazardous In-Flight Weather Advisory Service (HIWAS) program. HIWAS is a continuous broadcast over selected Very High Frequency Omnidirectional Range Stations (VORs) of hazardous weather information contained in Alert Weather Watches (AWWs), SIGMETs, Convective SIGMETs, Center Weather Advisories (CWAs), Airman's Meteorological Information (AIRMETS), and urgent pilot reports (PIREPs). The program is currently operational in the Miami, Jacksonville, and Houston ARTCCs. According to the FAA, HIWAS is to be implemented in the conterminous United States by the end of calendar year 1988. The Safety Board supports the intent of HIWAS and believes this program addresses the need for the timely dissemination of hazardous meteorological information to flightcrews. However, the Safety Board believes that the program can be completed before the end of 1988 and urges the FAA to expedite its implementation.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Amend Chapter 2, Section 6, paragraph 2-101, of the Air Traffic Control Handbook, 7110.65E, to require air traffic controllers to frequently broadcast the significant hazardous weather reports that are in effect. (Class II, Priority Action) (A-88-20)

Amend Chapter 4, Section 7, Paragraph 342, subparagraph (1)(h) of the Airman's Information Manual to include airborne weather radar as an item of equipment whose complete or partial loss of capability should be reported to air traffic control. (Class II, Priority Action) (A-88-21)

Amend Chapter 2, paragraph 2-7 of the Air Traffic Control Handbook, 7110.65E, to include airborne weather radar equipment as an in-flight equipment loss or malfunction covered by this paragraph. (Class II, Priority Action) (A-88-22)

Expedite the implementation of the Hazardous In-Flight Weather Advisory Service program in all Air Route Traffic Control Centers within the conterminous United States, prior to the summer convective weather season of 1988. (Class II, Priority Action) (A-88-23)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, NALL, and KOLSTAD, Members, concurred in these recommendations.

  
By: Jim Burnett  
Chairman

Brief of Accident (Continued)

File No. - 198

4/04/86

REMWATER, TX

A/C Reg. No. N505K

Time (LCT) - 1922 CST

Occurrence #1 AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION  
Phase of Operation CLIMB - TD CRUISE

Findings(s)

1. FLIGHT/NAV INSTRUMENTS, WEATHER RADAR SYSTEM - FAILURE, PARTIAL
2. OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - CONTINUED - PILOT IN COMMAND

Occurrence #2 IN FLIGHT ENCOUNTER WITH WEATHER  
Phase of Operation CRUISE - NORMAL

Findings(s)

3. WEATHER CONDITION - THUNDERSTORM
4. WEATHER CONDITION - TURBULENCE, CLEAR AIR
5. WEATHER CONDITION - GUSTS
6. WEATHER CONDITION - DOWNDRAFT
7. LIGHT CONDITION - DARK NIGHT
8. PREFLIGHT BRIEFING SERVICE - IMPROPER - ATC PERSONNEL (FSS)
9. HAZARDOUS WEATHER ADVISORY - NOT ISSUED - ATC PERSONNEL (FSS)
10. IN FLIGHT WEATHER ADVISORIES - NOT ISSUED - ATC PERSONNEL (FSS)
11. IMPROPER USE OF FACILITY, INFORMATION UNCLEAR - ATC PERSONNEL (FSS)

Occurrence #3 LOSS OF CONTROL - IN FLIGHT  
Phase of Operation CRUISE - NORMAL

Findings(s)

12. REMEDIAL ACTION - ATTEMPTED - PILOT IN COMMAND
13. IMPROPER USE OF PROCEDURE, EXCESSIVE WORKLOAD (TASK OVERLOAD) - PILOT IN COMMAND
14. IMPROPER USE OF PROCEDURE, EXCESSIVE WORKLOAD (TASK OVERLOAD) - COPILOT

Occurrence #4 LOSS OF POWER (TOTAL) - NON-MECHANICAL  
Phase of Operation DESCENT - UNCONTROLLED

Occurrence #5 IN FLIGHT COLLISION WITH TERRAIN  
Phase of Operation DESCENT - UNCONTROLLED

Probable Cause

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are finding(s) 1,3,4,5,6,8,9,10,11

Factor(s) relating to this accident is/are finding(s) 2,7,13,14

Brief of Accident

File No. - 198 4/04/86 REDWATER, TX A/C Reg. No. NS05K Time (LCL) - 1922 CST

-----Basic Information-----  
Type Operating Certificate-NONE (GENERAL AVIATION)

Type of Operation -BUSINESS  
Flight Conducted Under -14 CFR 91  
Accident Occurred During -DESCENT

-----Aircraft Information-----  
Make/Model - ISRAEL ACFT INDUSTRIES 1124A Eng Make/Model - GARRETT TFE731-3-16  
Landing Gear - TRICYCLE-RETRACTABLE Number Engines - 2  
Max Gross Wt - 23500 Engine Type - TURBOFAN  
No. of Seats - 8 Rated Power - 3700 LBS THRUST

-----Environment/Operations Information-----  
Weather Data  
Wx Briefing - FSS  
Method - TELEPHONE  
Completeness - PARTIAL,LHTRD BY FCSTR Destination: DALLAS, TX  
Basic Weather - VMC TETERBORO,NJ  
Wind Dir/Speed- 060/006 KTS  
Visibility - 10.0 SH  
Lowest Sky/Clouds - UNKN/NR  
Lowest Ceiling - 4000 FT BROKEN  
Obstructions to Vision- NONE  
Precipitation - RAIN  
Condition of Light - NIGHT(DARK)

-----Personnel Information-----  
Pilot-In-Command Age - 35  
Certificate(s)/Rating(s) Biennial Flight Review  
COMMERCIAL,ATP,CFI Current - YES  
SE LAND,ME LAND Months Since - 4  
Aircraft Type - L-1329  
Instrument Rating(s) - AIRPLANE  
Medical Certificate - VALID MEDICAL-NO WAITERS/LIMIT  
Flight Time (Hours)  
Total 7353  
Make/Model- UNK/NR  
Instrument- UNK/NR  
Multi-Eng - 5253  
Rotorcraft - UNK/NR

-----Narrative-----  
AIRPLANE CRASHED DURING A UNCONTROLLED DESCENT, FOLLOWING A TURBULENCE UPSET AT FL370, THE UPSET OCCURRED AS A RESULT OF CLR AIR TURB ASSOCIATED WITH A VIP LVL 4 THUNDERSTORM LOCATED WITHIN 7 MILES OF THE LAST POS OF THE AIRPLANE. AFTER THE UPSET, THE AIRPLANE PENETRATED AND DESCENDED THRU THE CELL WHICH CONTAINED LIGHTNING, EXTREME TURB AND SEVERE ICING. DURING THE UPSET/DESCENT BOTH ENG'S FLAMED OUT AND THE CREW'S ATTEMPTS TO RECOVER THE AIRPLANE WERE UNSUCCESSFUL DUE TO CONDITIONS IN THE CELL. CREW RECV'D AN IMPROPER BRIEFING FROM FSS AND REPT'D THEIR RADAR WAS MALFUNCTIONING TO THE DEP CONTROLLER. SIGHT AND AWX INFO WAS NOT GIVEN DURING THE BRIEFING. AS THE AIRPLANE CAME OUT OF THE ROTOR OF THE CELL AT 4,000', THE CREW OVERSTRESSED THE AIRPLANE CAUSING THE LFT MGR DNGR TO SEPARATE AND HIT THE HORZ STAB WHICH SUBSEQUENTLY SEPARATED IN OVERLOAD. IMPACT WAS 83 DEGREES NOSE DOWN. NATURE OF THE AIRPLANE DAMAGE CANNOT BE DETERMINED.