



National Transportation Safety Board Aviation Accident Final Report

Location:	Atlanta, GA	Accident Number:	NYC07LA229
Date & Time:	09/14/2007, 1719 EDT	Registration:	N100G
Aircraft:	Israel Aircraft Industries Astra SPX	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Minor, 3 None
Flight Conducted Under:	Part 91: General Aviation - Executive/Corporate		

Analysis

The pilot-in-command (PIC) of the airplane was the flight department's chief pilot, who was in the right seat and monitoring the approach as the non-flying pilot. The second-in-command (SIC) was a captain for the flight department, who was in the left seat and the flying pilot. On arrival at their destination, they were vectored for an instrument-landing-system (ILS) approach to a 6,001-foot-long runway. Visibility was 1-1/4 miles in rain. The autopilot was on and a coupled approach was planned. After the autopilot captured the ILS, the airplane descended on the glideslope. The PIC announced that the approach lights were in sight and the SIC stated that he also saw the lights and disengaged the autopilot. The SIC turned on the windshield wipers and then lost visual contact with the runway. He announced that he lost visual contact, but the PIC stated that he still saw the runway. The SIC considered a missed approach, but continued because the PIC still had visual contact. The PIC stated, "I have the lights" and began to direct the SIC. He then "took over the controls." The airplane touched down, the speed brakes extended and, approximately 1,000 feet later, the airplane overran the runway. The PIC stated that he was confused as to who was the PIC, and that he and the SIC were "co-captains." When asked about standard operating procedures (SOPs), the PIC advised that they did not have any. They had started out with one pilot and one airplane, and they now had five pilots and two airplanes. The PIC later stated that they probably should have gone around when the flying pilot could not see out the window. The PIC added that the windshields had no coating and did not shed water. One year prior, while flying in rain, his vision through the windshield was blurred but he did not report it to their maintenance provider. Manufacturer's data revealed that the windshield was coated to enhance vision during rain conditions. The manufacturer advised that the coating might not last the life of the windshield and provided guidance to determine both acceptable and unacceptable rain repellent performance.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to initiate a missed approach and his failure to obtain the proper touchdown point while landing in the rain. Contributing to the accident were the operator's lack of

standard operating procedures and the inadequate maintenance of the windshield.

Findings

Occurrence #1: OVERRUN

Phase of Operation: LANDING

Findings

1. (C) MISSED APPROACH - NOT PERFORMED - PILOT IN COMMAND
2. (C) PROPER TOUCHDOWN POINT - NOT OBTAINED - PILOT IN COMMAND
3. (F) PROCEDURES/DIRECTIVES - INADEQUATE - COMPANY/OPERATOR MANAGEMENT
4. WINDOW, FLIGHT COMPARTMENT WINDOW/WINDSHIELD - INADEQUATE
5. (F) MAINTENANCE - INADEQUATE - COMPANY/OPERATOR MANAGEMENT
6. WEATHER CONDITION - RAIN

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT

Phase of Operation: LANDING - ROLL

Findings

7. OBJECT - APPROACH LIGHT/NAVAID

Factual Information

HISTORY OF FLIGHT

On September 14, 2007, about 1719 eastern daylight time, an Israel Aircraft Industries (IAI) Astra SPX, N100G, sustained substantial damage during a runway overrun while landing at Dekalb-Peachtree Airport (PDK), Atlanta, Georgia. The certificated airline transport pilot captain received minor injuries, and the certificated airline transport pilot first officer and two passengers received no injuries. Day instrument meteorological conditions prevailed for the corporate flight that departed Chester County Airport (MQS), Coatesville, Pennsylvania. An instrument flight rules flight plan was filed for the flight conducted under 14 Code of Federal Regulations Part 91.

The pilot-in-command (PIC) of the flight was the flight department's chief pilot, who was in the right seat and was monitoring the approach as the non-flying pilot. The other pilot, who was also a captain for the flight department, was acting as the second in command (SIC) in the left seat and was the flying pilot.

According to the flight crew, they departed MQS at 1520 for PDK. They were scheduled to spend the night in the Atlanta area, and then continue the next morning to a private airstrip in Texas. Though rain was forecast for the Atlanta area, "it was well within limits."

Upon arrival in the Atlanta area, air traffic control (ATC) vectored the flight for the instrument landing system (ILS) runway 20L approach. The weather was above minimums with 1 1/4 miles visibility in rain. The SIC had selected the autopilot on previously, and after capturing the ILS, the airplane began to descend on the glideslope. The PIC then announced that the approach lights were in sight and the SIC responded that he also had the approach lights in sight, and disengaged the autopilot.

The SIC then attempted to continue and land visually, though they were flying in moderate to heavy rain. Up to this point they had experienced no turbulence and had "good visual contact" with the approach lights. The SIC then turned on the windshield wipers and approximately 10 seconds later, lost visual contact with the runway. He announced that he had lost visual contact, but the PIC stated that he still had the runway in sight.

The SIC then considered a missed approach, but continued because the PIC still had "good visual contact." The PIC told the SIC, "I have the lights" and began to direct the SIC. He then, however, "took over the controls." As the airplane touched down, the speed brakes extended, and the flight crew realized that they had approximately 1,000 feet of runway remaining. The tower then advised them "to go around." The airplane then overran the runway, struck the localizer antenna and stopped near the airport fence, after traveling several hundred feet past the end of the runway.

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) and pilot records, the chief pilot (PIC) held an airline transport pilot certificate, with multiple ratings including airplane multiengine land, and type ratings for the Cessna 500, Lear Jet, and IAI Astra. He reported a total flight time of 10,800 hours, with 8,800 hours in multiengine airplanes and 2,200 hours in the IAI Astra. His most recent FAA second-class medical certificate was issued on June 12, 2007.

The captain (SIC) held an airline transport pilot certificate, with multiple ratings including

airplane multiengine land, and type ratings for the Dassault 2000, Lear Jet, Saberliner, Saab 340, and IAI Astra. He reported a total flight time of 16,042 hours, with 13,950 hours in multiengine airplanes and 1,500 hours in the IAI Astra. His most recent FAA second-class medical certificate was issued on April 23, 2007.

AIRCRAFT INFORMATION

According to FAA and maintenance records, the airplane was manufactured in 1998. The airplane's most recent inspection was completed on May 31, 2007. At the time of the accident, the airplane had accrued 4194.5 total hours of operation.

METEOROLOGICAL INFORMATION

The reported weather at PDK at 1718, included: wind from 270 degrees at 7 knots, visibility 1 1/4 mile, light rain, mist, scattered clouds at 1,800 feet, broken clouds at 2,500 feet, overcast ceiling at 3,800 feet, temperature 23 degrees Celsius, dew point 22 degrees Celsius, and an altimeter setting of 29.96 inches of mercury.

The reported weather at PDK at 1720, included: calm winds, visibility 1/2 mile, heavy rain, fog, broken clouds at 1,800 feet, broken clouds at 2,400 feet, temperature 23 degrees Celsius, dew point 22 degrees Celsius, and an altimeter setting of 29.95 inches of mercury.

AIRPORT INFORMATION

According to the Airport Facility Directory, PDK was a public use airport. It had four runways, oriented in a 02/20 (left and right), 16/34, and 9/27 configuration. Runway 20L was grooved concrete, in good condition. It was 6,001 feet long by 100 feet wide. The threshold was displaced 1,000 feet due to obstructions. The runway had precision markings that were in good condition. It was equipped with a precision approach path indicator, a medium intensity approach lighting system with sequenced flashers, and an ILS.

WRECKAGE AND IMPACT INFORMATION

Examination of the airplane and accident site by an FAA inspector revealed that the airplane had received impact damage to the nose, wings, engines, and landing gear. Additionally, six of the ILS localizer antennas had received impact damage.

TESTS AND RESEARCH

Cockpit Voice Recorder (CVR) Information

The accident airplane was equipped with a Universal CVR-30A, which recorded 30 minutes of digital audio.

As the recording started, the airplane was at flight level 350 (35,000 feet pressure altitude) and was cleared by ATC to start a descent for landing in Atlanta. The descent continued uneventfully until just prior to touchdown, when the SIC, at 17:18:24, stated that he had "lost sight of the runway." The PIC then stated, "Still have it?" Then began to direct the SIC verbally by saying, "just follow the glide slope," followed by, "little bit to the right, little to the right," and then stating "there it is," and "you got it?" to which the SIC responded "yep I got it."

At 17:18:43, the PIC once again began to direct the SIC by stating, "okay to the left, left, left, left." Three seconds later the SIC asked, "I'm on the runway now, right?" The PIC then responded, "yeah," and at 17:18:55, said "I got it," and then "we're not going to make it." The SIC then stated, "I don't know what to do," and moments later the sounds of multiple impacts

were recorded.

Additional Interviews

Both the chief pilot and the captain were re-interviewed by a National Transportation Safety Board investigator in the months following the accident.

The chief pilot advised the Safety Board during the interviews that they probably "should have gone around" when the captain could not see anything out of his window and that he had a similar situation the year before when he was in the left seat and could not see anything and "aborted the landing."

He also stated that they "probably should have gone somewhere else."

When queried as to who was in command of the flight, the chief pilot stated that he was confused as to who was the PIC and advised that both he and the captain were "co-captains."

When asked about the flight department's standard operating procedures (SOPs), the chief pilot advised that they did not have any, and that the flight department had started out as just one pilot and one airplane, and that they now had five pilots and two airplanes, and operated for two different companies.

According to the captain, when he lost sight of the runway, the chief pilot may have taken over the controls and that when the chief pilot told him to start coming to the "left, left, left, left," both he and the chief pilot may have been on the controls at the same time. Additionally, when he went to deploy the reversers, the chief pilot's hand "was on them."

He believed that there was a lack of crew resource management (CRM), and advised that there were no SOPs or "company manual" and that the chief pilot "kind of takes over."

He advised that both he and the chief pilot were captains, and they would switch seats on every leg. He also advised that at previous companies he had worked, that it was always decided as to who was the PIC before the flight.

Windshields

The Astra cockpit transparency system consisted of the pilot and co-pilot's windshield, each made up of a laminated glazing (transparency). The windshield transparency had an attached outer frame (one piece) and an inner retainer ring (segmented). The outer periphery of the one-piece outer metal frame included a hole pattern, pre-drilled in the frame, which matched the windshield attach holes pre-drilled in the windshield airframe structure. The windshield transparency was comprised of two polycarbonate mainplies, bonded together by a urethane interlayer, a tempered glass faceply (outer surface) and an abrasion resistant acrylic crewshield (inner ply), both bonded to the mainplies by a silicone interlayer. The windshield employed a 28-volt direct current heater system for anti-ice and anti-fog purposes.

Examination of maintenance records revealed that the pilot's windshield had been replaced on April 26, 2005.

During the course of the investigation, the chief pilot advised the Safety Board that the windshields had no coating and were not designed to shed water, and that he found out after the accident that some operators used "Rain-X," as a water repellent on their windshields. He also advised that approximately 1 year prior to the accident, when he was flying the airplane in rain, his vision through the windshield was blurred, but he did not report it to the flight

department's maintenance provider.

Examination of photographic evidence, as well as manufacturer's data, revealed that the glass surface of the windshield was coated during the manufacturing process to enhance vision during rain conditions. The windshield manufacturer advised that the coating would not last the entire service life of the windshield.

Cleaning, repair, and recoating information were also discovered in the maintenance manual, and the windshield component maintenance manual. Examination of these manuals revealed that they not only addressed the use of Rain-X for cleaning and to increase the rain shedding performance of the windshield, but also advised what other products could (or could not) be used on the windshield surfaces.

Information was also provided to determine the windshield's disposition for service, repair, or removal from the airplane and guidance to determine both acceptable and unacceptable rain repellent performance.

Windshield Wipers

The windshields on the Astra SPX were also equipped with both left and right windshield wipers for water removal. They were independently operated by dual electric motors and controlled by separate switches.

The wipers' operating speeds were controlled independently, and could be operated in three speed positions; low, medium, and high.

According to the captain, operation of the wipers did not help clear his windshield.

ADDITIONAL INFORMATION

At the time of this report, data collected by the Safety Board as well as the FAA revealed that runway overruns during the landing phase of flight, involving turbine-powered aircraft, accounted for approximately 10 incidents or accidents every year, with varying degrees of severity, with many accidents resulting in fatalities.

A review of several runway overrun events revealed a lack of, or nonadherence to SOPs.

As a result, on November 6, 2007, the FAA released Advisory Circular AC 91-79, to address runway-overrun prevention, and emphasize SOP development and risk mitigation.

On November 19, 2007, the chief pilot advised the Safety Board that he would be incorporating SOPs into his flight department's operations, and that they would continue to train, and practice CRM in their flight operations.

Pilot Information

Certificate:	Airline Transport; Commercial	Age:	54, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	06/01/2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	09/01/2006
Flight Time:	10800 hours (Total, all aircraft), 2200 hours (Total, this make and model), 10000 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 35 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport; Flight Instructor	Age:	54, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	04/23/2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	09/01/2006
Flight Time:	16042 hours (Total, all aircraft), 1500 hours (Total, this make and model), 10425 hours (Pilot In Command, all aircraft), 56 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Israel Aircraft Industries	Registration:	N100G
Model/Series:	Astra SPX	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	092
Landing Gear Type:	Retractable - Tricycle	Seats:	9
Date/Type of Last Inspection:	05/01/2007, AAIP	Certified Max Gross Wt.:	24650 lbs
Time Since Last Inspection:		Engines:	2 Turbo Fan
Airframe Total Time:	4194.5 Hours at time of accident	Engine Manufacturer:	Allied Signal
ELT:	Installed, not activated	Engine Model/Series:	TFE-731-40R
Registered Owner:	Hawk Flight Inc.	Rated Power:	4250 lbs
Operator:	Hawk Flight Inc.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PDK, 1003 ft msl	Distance from Accident Site:	
Observation Time:	1720 EDT	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	0 Miles
Lowest Ceiling:	Broken / 1800 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.95 inches Hg	Temperature/Dew Point:	23°C / 22°C
Precipitation and Obscuration:	Heavy - Rain; Fog		
Departure Point:	Coatesville, PA (MQS)	Type of Flight Plan Filed:	IFR
Destination:	Atlanta, GA (PDK)	Type of Clearance:	IFR
Departure Time:	1520 EDT	Type of Airspace:	

Airport Information

Airport:	Dekalb-Peachtree Airport (PDK)	Runway Surface Type:	Concrete
Airport Elevation:	1003 ft	Runway Surface Condition:	Wet
Runway Used:	20L	IFR Approach:	ILS
Runway Length/Width:	6001 ft / 100 ft	VFR Approach/Landing:	Full Stop

Wreckage and Impact Information

Crew Injuries:	1 Minor, 1 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor, 3 None	Latitude, Longitude:	33.875556, -84.301944 (est)

Administrative Information

Investigator In Charge (IIC):	Todd G Gunther	Report Date:	06/11/2009
Additional Participating Persons:	David Porter; FAA/FSDO; Atlanta, GA Stephen Klohr; General Dynamics Aviation Services; Savannah, GA		
Publish Date:	06/11/2009		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).