



National Transportation Safety Board

Washington, D.C. 20594

Aircraft Accident Investigative Update

WASHINGTON (Nov. 15, 2019) – The National Transportation Safety Board (NTSB) has issued an investigative update for the October 17 runway overrun at Tom Madsen Airport, Unalaska Alaska (Port of Dutch Harbor).

On October 17, 2019, about 1740 Alaska daylight time, PenAir flight 3296, a Saab 2000, N686PA, overran the runway while landing at the Thomas Madsen Airport (PADU), Unalaska, Alaska. The airplane passed through the airport perimeter fence, crossed a road, and came to rest on shoreline rocks. Of the 42 passengers and crewmembers on board, 1 passenger was fatally injured, and several other passengers sustained serious or minor injuries. The airplane received substantial damage. The regularly scheduled domestic passenger flight was operating under the provisions of 14 *Code of Federal Regulations* Part 121 from Ted Stevens International Airport (KANC), Anchorage, Alaska, to PADU.



Figure 1 View of the airplane looking northwest

The NTSB traveled to the scene of the accident, and the following investigative groups have been formed: Operational Factors, Human Performance, Systems and Structures, Powerplants, Aircraft Performance, Airports, Survival Factors, Flight Data Recorder, Cockpit Voice Recorder, and Maintenance Records.

Parties to the investigation include: The Federal Aviation Administration, PenAir and Rolls-Royce Engines.

In accordance with International Civil Aviation Organization (ICAO) Annex 13, the Swedish Accident Investigation Authority (SHK) has appointed an Accredited Representative as State of Design and Manufacture of the airplane. The Swedish Accredited Representative has appointed Saab as a technical advisor.

Investigators documented the airplane wreckage and runway marks, reviewed maintenance records, examined security camera and passenger video, and interviewed the accident crew members and other PenAir personnel from October 18 through 27 in Dutch Harbor and Anchorage.

According to the flight crew, the captain was the flying pilot and the first officer was the pilot monitoring. The first officer stated that he completed the performance calculations during cruise, before beginning descent, and prior to obtaining the weather at DUT. The flight crew indicated that they conducted a go-around during the first approach to runway 13 because they were not stabilized. On the second approach, the flight crew indicated they touched down about 1,000 feet down the runway and the captain initiated reverse thrust and normal wheel-braking. The captain stated that he went to maximum braking around the “80 knot call.” The flight crew reported that they attempted to steer the airplane to the right at the end of the runway to avoid going into the water.

The captain indicated he held an airline transport pilot certificate and had accumulated about 20,000 total flight hours of which about 14,000 hours were in the DH-8 and 101 hours were in the Saab 2000. The first officer indicated that he held an airline transport pilot certificate and had accumulated 1,446 total flight hours of which 147 were in the Saab 2000.

RUNWAY INFORMATION

Runway 13/31 at PADU is 4,500 feet long and 100 feet wide with a grooved asphalt surface.

There was a 5-inch-wide dark rubber witness mark on the runway, about 15 feet left of the runway centerline, starting about 1,840 feet from runway 13’s displaced threshold, and extending about 200 feet. Small fragments of tire were found in the area near the end of the dark rubber witness mark. The left main landing gear outboard tire was found deflated with an area that had worn entirely through the tire. There were dark rubber deposits marks from all except the outboard left main landing gear tires, in an arc to the right in the runway overrun area.

Witness marks indicated that the airplane departed the runway and overrun area, traversed a section of grass, impacted a 3- to 4-ft high chain-linked perimeter fence with evidence of left engine propeller contact, crossed a ditch, impacted a large rock, and crossed a public roadway. The left

wing or left engine propeller struck a 4 to 5 ft vertical signal post on the opposite shoulder of the road and the left propeller struck a 6 to 8-ft high yellow diamond shaped road sign. There were strike marks consistent with the right engine's propeller tips contacting the ground near where the airplane came to rest.

AIRPLANE AND ENGINES

Examination of the fuselage revealed a hole and impact damage to the left forward fuselage around the 5th window (Figure 2). A propeller blade was loosely stuck in the surrounding structure external to the fuselage and another propeller blade was found inside the fuselage. All cabin seats (15 rows) were intact and secure to the floor except for seat 4A, which was displaced and damaged. The damaged area of the cabin was contained within the area on the left side between fuselage station (FS) 399 (seat 3A) and FS 488 (seat 6A), with extensive damage evident at FS 435. The left side overhead compartment (FS 399 to FS 488) partially separated from its mounts and descended about 6 to 12 inches with various brackets and debris hanging down into the seats or laying on the floor. The wall panel separated at FS 399 and displaced rearward and inward. The 4A window fuselage frame was located on the cabin floor.



Figure 2 Damage to left side of fuselage

The four main landing gear tires and brake assemblies were examined. The tire pressures were documented prior to moving the airplane. The left outboard (OB) tire was deflated, the left inboard (IB) tire was at 135 psi, and the right OB and IB tires were greater than 160 psi (maximum reading of the available gauge). A placard on the landing gear door indicated that the allowable pressures were between 165-173 psi. The left OB tire had an area approximately 11 inches in length which was ground flat all the way through the tire (See Figure 3). Because hydraulic pressure could not be applied, only an approximate measurement of the carbon brake wear pins could be made. All

wear pins were in serviceable ranges. Multiple components were removed for further examination and testing.



Figure 3 Damage to left outboard tire

The airplane was equipped with two Rolls-Royce AE2001A turbo-propeller engines, and two Dowty R381/6-123-F/5 with 6 composite propeller blades. The left engine remained attached to the engine mounts although the right rear engine mount was bent and buckled. The left engine's propeller assembly was sagging in relation to the engine's nacelle with the propeller shaft support resting on the forward part of the nacelle. The propeller reduction gear box front housing was fractured 360° around forward of the diaphragm and in the area of the ring gear. There were broken pieces of gear box housing laying on the engine deck. The propeller shaft aft bearing was missing 3 adjacent rollers from the bearing cage. The engine was complete and did not have any indications of an uncontainment or case rupture.

The left propeller hub was intact. Pieces of the blade, either part of the airfoil or just the blade butt, remained in all six blade locations on the hub. All of the propeller blades that still had parts of an airfoil remaining were in the feathered position. At those locations where the airfoil was missing, the blade retaining clamps were in place with the retaining bolts in place and safety wired. Blades Nos. 1, 3 and 4 were missing, although the base of each blade remained in the hub (Figure 4). Blade No. 2 was in place in the hub and the blade was fractured transversely across the airfoil

about 28.5-inches from the disk to the fractured end. Blade No. 5 was broken about 48-inches from the disk to the fractured end. Blade No. 6 was broken about 48-inches from the disk to the fractured end. The three blades that were missing from the left engine's propeller hub were all recovered. There was a propeller blade that was recovered from the water that was about 48-inches long. There was a propeller blade that was found hanging on the left side of the airplane from some cabin insulation that had wrapped around the butt of the blade that was about 58.5-inches long. There was a blade that was found in the cabin that was about 57-inches long.



Figure 4 Damage to left propeller

The right engine was intact and the propeller could be turned with little force. All six right propeller blade tips were broken away between 53.5-inches and 56.75-inches from the disk to the fractured end (Figure 5).



Figure 5 Right engine and propeller

FLIGHT RECORDERS

The flight data recorder (FDR) and cockpit voice recorder (CVR) were sent to the NTSB Vehicle Recorder Laboratory in Washington, DC, for readout. The initial examination of the recorder data revealed the following:

Flight Data Recorder

- More than 43 hours of recorded data was recovered, including, aircraft basic, engine, auto-flight, flight controls, and warning and status parameters.
- The accident flight was recorded, and the accident was captured at the end of the recording.
- Touchdown occurred with the aircraft traveling at about 129 knots indicated airspeed and 142 knots ground speed.
- Following touchdown, the aircraft decelerated reaching a peak deceleration of -0.48 g., with the engines operating in reverse mode.
- About 25 seconds after main gear touchdown, a change in aircraft pitch and roll, and an increase in the magnitude of triaxial acceleration forces was recorded, consistent with the aircraft departing the runway surface. The engines were taken out of reverse mode and ground speed at that time was about 23 knots.

Cockpit Voice Recorder

- The CVR group convened from October 29-31, 2019 in the Recorder Laboratory to complete a transcript of accident flight.
- The flight was cleared for the RNAV runway 13 approach into PADU.

- Weather was initially reported (by the local weather observer) as winds 210 degrees at 8 knots, gusting to 14 knots, visibility 7 to 10 miles, a ceiling at 4,300ft that was broken, a temperature of 8 degrees Celsius, a dew point of 1 degree Celsius, and an altimeter setting of 29.50 inches Hg.
- A later transmission from the local weather observer to another aircraft reported the winds were 180 degrees at 7 knots, visibility 8 to 10 miles with showers in the vicinity, and a broken ceiling at 3,900 feet.
- The aircraft was configured for the approach: flaps 20, gear down.
- During the approach, the winds were reported as 270 deg at 10 knots.
- A go-around was executed, and the flight returned for a visual approach to runway 13. During the go-around, the winds were reported as 300 degrees at 8 knots.
- After the go-around, the winds were reported to be 290 at 16 gust 30 (multiple overlapping radio transmissions occurred at this time). Transmissions between the weather observer and another airplane indicated that winds favored runway 31 but could shift back to runway 13.
- The aircraft was configured again for the approach: flaps 20, gear down.
- During the second approach, winds were reported as 300 degrees at 24 knots.
- The aircraft touched down and the roll out lasted approximately 26 seconds until the aircraft departed the runway.
- The crew announced, over the PA, an evacuation out the right side of the aircraft and made a radio call for assistance
- The CVR transcript will be released when the public docket is opened.

Additional information will be released as warranted.