National Transportation Safety Board
Aviation Accident Final Report

Location:	Portland, OR	**Accident Number:**	WPR11FA052
Date & Time:	11/17/2010, 1553 PST	**Registration:**	N25PJ
Aircraft:	GATES LEAR JET 25B	**Aircraft Damage:**	Substantial
Defining Event:	Landing area overshoot	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The airplane was flying a VOR/DME-C approach that was on an oblique course about 40 degrees to the runway 30 centerline; the wind conditions produced an 8-knot tailwind for landing on runway 30. Despite the tailwind, the captain elected to land on the 6,600-foot-long runway instead of circling to land with a headwind. Moderate to heavy rain had been falling for the past hour, and the runway was wet. The crew said that the airplane was flown at the prescribed airspeed (Vref) for its weight with the wing flaps fully extended on final approach, and that they touched down just beyond the touchdown zone. The captain said that he extended the wings' spoilers immediately after touchdown. He tested the brakes and noted normal brake pedal pressure. However, during rollout, he noted a lack of deceleration and applied more brake pressure, with no discernible deceleration. The airplane's optional thrust reversers had been previously rendered non-operational by company maintenance personnel and were therefore not functional. The captain stated that he thought about performing a go-around but believed that insufficient runway remained to ensure a safe takeoff. While trying to stop, he did not activate the emergency brakes (which would have bypassed the anti-skid system) because he thought that there was insufficient time, and he was preoccupied with maintaining control of the airplane. He asked the first officer to apply braking with him, and together the crew continued applying brake pedal pressure; however, when the airplane was about 2,000 feet from the runway's end, it was still traveling about 100 knots. As the airplane rolled off the departure end on runway 30, which was wet, both pilots estimated that the airplane was still travelling between 85 and 90 knots. The airplane traveled 618 feet through a rain-soaked grassy runway safety area before encountering a drainage swale that collapsed the nose gear. As the airplane was traversing the soft, wet field, its wheels partially sank into the ground. While decelerating, soil impacted the landing gear wheels and struts where wiring to the antiskid brake system was located. The crew said that there were no indications on any cockpit annunciator light of a system failure or malfunction; however, after the airplane came to a stop they observed that the annunciator light associated with the antiskid system for the No. 2 wheel was illuminated (indicating a system failure). The other three annunciator lights (one for each wheel) were not illuminated.

During the approach, the first officer had completed the landing data card by using a company-

developed quick reference card. The quick reference card's chart, which contained some data consistent with the landing charts in the Airplane Flight Manual (AFM), did not have correction factors for tailwind conditions, whereas the charts in the AFM do contain corrective factors for tailwind conditions. The landing data prepared by the first officer indicated that 3,240 feet was required to stop the airplane on a dry runway in zero wind conditions, with a wet correction factor increasing stopping distance to 4,538 feet. The Vref speed was listed as 127 knots for their landing weight of 11,000 pounds, and the first officer's verbal and written statements noted that they crossed the runway threshold at 125 knots. During the investigation, Bombardier Lear calculated the wet stopping distances with an 8-knot tailwind as 5,110 feet.

The touchdown zone for runway 30 is 1,000 feet from the approach end. The crew's estimate of their touchdown location on the runway is about 1,200 feet from the approach end, yielding a remaining runway of 5,400 feet. On-duty controllers in the tower watched the landing and said that the airplane touched down in front of the tower at a taxiway intersection that is 1,881 feet from the approach end, which would leave about 4,520 feet of runway to stop the airplane. The controllers observed water spraying off the airplane's main landing gear just after touchdown.

Postaccident testing indicated that the brake system, including the brake wear, was within limits, with no anomalies found. No evidence of tire failure was noted. The antiskid system was removed from the airplane for functional tests. The control box and the left and right control valves tested within specifications. The four wheel speed sensors met the electrical resistance specification. For units 1, 2 and 3, the output voltages exceeded the minimum specified voltages for each of the listed frequencies. Unit 4 was frozen and could not be rotated and thus could not be tested. Sensors 1 and 2 exceeded the specified 15% maximum to minimum voltage variation limit. Sensor 3 was within the limit and 4 could not be tested.

Based on all the evidence, it is likely that the airplane touched down on the water-contaminated runway beyond the touchdown zone, at a point with about 600 feet less remaining runway than the performance charts indicated that the airplane required for the wet conditions. Since a reverted rubber hydroplaning condition typically follows an encounter with dynamic hydroplaning, the reverted rubber signatures on the No. 2 tire indicate that the airplane encountered dynamic hydroplaning shortly after touchdown, and the left main gear wheel speed sensor anomalies allowed the left tires to progress to reverted rubber hydroplaning. This, along with postaccident testing, indicates that the anti-skid system was not performing optimally and, in concert with the hydroplaning conditions, significantly contributed to the lack of deceleration during the braking attempts.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the flight crew to stop the airplane on the runway due to the flying pilot's failure to attain the proper touchdown point. Contributing to the accident was an anti-skid system that was not performing optimally, which allowed the airplane to encounter reverted rubber hydroplaning, and the company-developed quick reference landing distance chart that did not provide correction factors related to tailwind conditions.

Findings

Aircraft	Descent/approach/glide path - Not attained/maintained (Cause) Landing distance - Not attained/maintained (Cause) Anti-skid section - Not specified (Cause)
Personnel issues	Aircraft control - Pilot (Cause)
Environmental issues	Wet surface - Contributed to outcome
Organizational issues	Adequacy of documents/info - Operator (Factor)

Factual Information

HISTORY OF FLIGHT

On November 17, 2010, about 1553 Pacific standard time, a Gates Lear Jet, 25B, N25PJ, experienced separation of its nose gear assembly upon impacting terrain during a landing overrun accident at the Portland-Hillsboro Airport (HIO), Portland, Oregon. The airplane was owned and operated by Premier Jets, Inc., Hillsboro, Oregon, and it was substantially damaged. Neither the airline transport certificated pilot-in-command (PIC) nor the commercial licensed second-in-command (SIC) was injured. Instrument meteorological conditions prevailed at the time of the positioning flight that was performed under the provisions of 14 Code of Federal Regulations Part 91. An instrument flight rules (IFR) flight plan was filed. The flight originated from Boise, Idaho, about 1545 mountain standard time (68 minutes before the accident).

The pilots reported to the National Transportation Safety Board investigator that the accident occurred on the return leg of a round-trip flight from HIO to Boise. No evidence of any mechanical malfunction or system anomaly was noted with the airplane on the outbound flight.

The PIC, who was the flying pilot during both the outbound and inbound legs, reported that on the return leg the air traffic controller cleared him to perform the VOR/DME-C instrument approach procedure (IAP) to HIO. He flew this approach and elected to circle to land on runway 30, rather than circle to land on runway 12. [There is no straight-in landing option on this IAP.] The PIC said that on short final approach the airplane was flown at the prescribed airspeed (Vref), with the wing flaps fully extended. According to the PIC, in all respects the approach and landing were normal.

The PIC further reported that he extended the wings' spoilers immediately after touchdown. He tested the brakes and normal brake pedal pressure was noted. However, during rollout he noted a lack of deceleration and more brake pressure was applied, with no discernable deceleration. The airplane's optional thrust reversers were not used; they had been previously rendered non-operational by company maintenance personnel and were therefore not functional.

According to the PIC, although the indicated brake pressure remained normal, within a few seconds both he and the second pilot recognized that the airplane was not appropriately decelerating. The PIC stated that he directed the SIC try applying his brakes. The SIC reported to the Safety Board investigator that he complied with the PIC's directions. However, the airplane did not appropriately decelerate.

The PIC stated that he thought about performing a go around, but believed that insufficient runway remained to ensure a safe takeoff. While trying to stop, he did not activate the emergency brakes. He stated that there was insufficient time, and he was preoccupied with maintaining control of the airplane. According to the PIC, he continued applying brake pedal pressure, and when the airplane was about 2,000 feet from the runway's end, it was still traveling about 100 knots. As the airplane rolled off the departure end on runway 30, which was wet, both pilots estimated that it was still travelling between 85 and 90 knots. (Activation of the emergency brakes is accomplished by applying downward pressure to an activation handle located adjacent to the center console. Activation of emergency brakes bypasses the

antiskid system.)

The PIC further reported to the Safety Board investigator that he had no indication on any cockpit annunciator light of a system failure or malfunction. As the airplane was traversing the soft, wet field, its wheels partially sank into the ground. The nose gear sheared off in an aft direction when the airplane impacted and traversed the drainage ditch. Thereafter, the airplane slid on its nose until coming to a stop in the rain water-soaked field. While decelerating, soil impacted the landing gear wheels and struts where wiring to the antiskid brake system was located.

The PIC stated that after the airplane came to a stop he observed that the annunciator light associated with the antiskid system for the #2 wheel was illuminated (indicating a system failure). The other three annunciator lights (one for each wheel) were not illuminated.

During a subsequent conversation with the Safety Board investigator, the PIC initially opined that the brake and/or antiskid system appeared to have malfunctioned. The pilot stated that although the runway was wet, he did not believe the airplane hydroplaned. The pilot further stated that he opted to continue trying to decelerate rather than attempting to go-around because by the time he realized there was a deceleration problem, insufficient runway existed to ensure that a departure could be successfully performed from the remaining runway.

On duty Federal Aviation Administration (FAA) air traffic control tower (ATCT) personnel reported that the airplane appeared to have touched down abeam the ATCT at the intersection of taxiway A6 and runway 30. This intersection is located about 1,900 feet from runway 30's approach end, and about 4,700 feet from the runway's departure end.

The HIO ATCT's front line manager reported that while in the control tower, he observed the airplane approach the airport on the VOR/DME-C approach. The local controller offered the pilot any runway of his choice to use for landing, and he issued the pilot a wind check which indicated that the wind was from 180 degrees at 10 knots, with 16 knot gusts. The pilot requested and was cleared to land on runway 30. The airplane touched down in front of the ATCT, near the intersection of taxiway A6 and runway 30.

Another HIO air traffic controller reported that it was raining when the airplane landed, and the runway was wet. The controller stated that he observed water spraying off the airplane's main gear as the airplane passed in front of the control tower at the intersection of taxiway A-6 and runway 30.

According to the SIC's statements and a review of the airplane's radar derived flight track as it approached the airport revealed that the airplane was tracking on a northeasterly course and approached the airport from the southwest. As the airplane approached the airport, the pilot maneuvered its flight path into the base leg for runway 30. Thereafter, the pilot made a left turn, entered onto the final approach course, and landed. The second pilot stated that he recalled the approach was stabilized at Vref when on the final approach leg. Also, the airplane was initially above the visual glide path, but when on short final approach the airplane was on the visual glide path.

PERSONNEL INFORMATION

Pilot

The pilot, age 56, held an Airline Transport Pilot certificate with a multi-engine land rating, and type ratings in the Lear Jet series, Cessna 500, and the Swearingin SA-227. He also held commercial privileges for airplanes single engine land and sea. The pilot's most recent Federal Aviation Administration FAA 14 CFR 135.293 and 135.299 checkrides were accomplished on September 19, 2010, in the Lear 25B. The pilot held a first class medical certificate that was issued September 1, 2010, with the limitation that correcting lenses be worn. The pilot reported a total of 6,000 flight hours, with his recent flight experience in the 90 and 30 days prior to the accident estimated at 23 and 18 respectively, with 5 hours accrued in the Lear 25B.

Co-pilot

The Second in Command (SIC), age 34, held a commercial pilot certificate with ratings for airplanes single and multi-engine land and instruments. He also held a first class medical certificate issued July 20, 2010, with the limitation that correcting lenses be worn. The pilot reported a total flight time of 652 hours, with 10 hours accrued in the Lear 25B. The pilot said that in the preceding 90 days to the accident he had flown 10 hours. The pilot's most recent FAA 14 CFR 135.293 and 135.299 checkrides were accomplished on May 7, 2010, in a Lear 35. FAA inspectors examined the pilot's records and determined that he met the qualifications to act as a Second in Command in Learjets as specified in 14 CFR 61.55(f)(2).

The PIC was the owner of Premier Jets. He employed the second-in-command, who worked on a full time basis as his office manager, and also served as an on-demand air taxi pilot for the company.

AIRPLANE INFORMATION

Records review disclosed that the Lear 25B, serial number 25-111, was manufactured in 1973 and had accrued a total time in service of 8,453 hours at the time of the accident. The most recent maintenance check under the company's approved inspection program was accomplished on July 29, 2010. The airplane was equipped with 2 GE CJ610-6 engines that had accrued total times in service of 8,561 hours for the left engine and 8,632 for the right.

The crew reported the airplanes landing weight as 10,800 pounds, and they used sea level altitude and an outside air temperature of 50 degrees F in calculating the required landing distance.

The crew used a company developed quick reference chart to determine the landing distance and Vref speed. Review of the quick reference chart and the ones from the Airplane Flight Manual disclosed they produced similar numbers. Reference of both charts for the stated conditions, found that 3,240 feet were required to stop the airplane on a dry runway in zero wind conditions. The wet runway correction factor was listed as 1.4 times the dry distance, yielding a wet runway stopping distance of 4,538 feet. The Vref speed was listed as 127 knots for 11,000 pounds. The SIC's verbal and written statements noted that they crossed the runway threshold at 125 knots.

The quick reference chart used by the crew did not have correction factors for tailwind conditions. Bombardier Lear calculated the dry and wet stopping distance incorporating an 8 knot tailwind and reported stopping distances of 3,640 feet and 5,110 feet respectively.

METEOROLOGICAL INFORMATION

At 1553, the Automatic Terminal Information Service (ATIS) broadcast the airport's weather as, in part, wind from 180 degrees at 8 knots. There was an overcast ceiling at 1,300 feet above ground level, and the visibility was 2 miles in moderate intensity rain and mist. During the landing radio exchange between the local controller and the airplane's crew, the controller told the crew that the winds were from 180 degrees at 10 knots, with gusts to 16 knots.

AIDS TO NAVIGATION

According to FAA records of facility operations, all electronic aids to navigation pertinent to the aircraft's route of flight were functional on the day of the accident.

AIRPORT INFORMATION

Runways.

Runway 12/30 is 6,600 feet long by 150 feet wide. It has an asphalt non-grooved surface. Airport management reported that its surface condition was "good."

Runway 12's threshold elevation is 199.9 feet mean sea level (msl). Runway 30's threshold elevation is 198.0 feet msl. Landing on runway 30 provides a 0.2 percent uphill gradient. The magnetic course of runway 30 is 307.1 degrees.

The last surface rubber removal project was performed on 2003. Airport management reported that within a few months before or following the accident, it has not received complaints regarding poor or marginal stopping ability due to inadequate runway surface friction.

On February 11, 2011, the airport tested the surface friction (Mu) for runway 30. The runway's friction was found average between 0.670 and 0.701.

FLIGHT RECORDERS

The flight recorders were not obtained or read-out.

WRECKAGE AND IMPACT INFORMATION

Initially, the departure end of runway 30, adjacent safety area (RSA), and the runway protection zone (RPZ), were examined by HIO management staff and the FAA coordinator who responded to the accident site. Subsequently, the area was examined by the Safety Board investigator. Global positioning satellite measurements and area survey data were provided by the airplane operator and airport management personnel.

Based upon estimated 3- to 6-inch deep depressions in the soil that are consistent in appearance with the airplane's landing gear, the airplane impacted and severed a runway end light before overrunning the 203-foot- long RSA. The airplane then rolled downslope (estimated between 5 and 9 degrees) until impacting a rain water flooded drainage swale, which was located 470 feet from the runway's end. The airplane's separated nose gear strut, with attached wheel assembly, was found near the swale in the RPZ, where the ground was near level. The airplane traversed the swale with its nose on the ground. The airplane came to rest on a northwesterly heading in an upright and nose low pitch attitude in the soft, rain-soaked, near level open field. The approximate distance between the runway's end and the airplane was 618 feet.

A portion of the airplane's belly was found punctured aft of where the nose gear had been

attached, and belly skin panels were torn open. A portion of the forward pressure bulkhead was bent, and the bottom of the pressure vessel was punctured. There was no evidence of fire.

All of the airplane's flight control systems and engines were intact. No evidence of fuel leakage was found. The flight crew reported that the emergency locator transmitter (ELT) activated. Neither of the flight crew seats were damaged.

The left inboard wheel speed transducer wires were noted to be chaffed near the transducer connecter.

TESTS AND RESEARCH

Touchdown Location and Runway Distance Calculation

The SIC opined that the airplane touched down prior to the location where runway 20 intersects runway 30. [This intersection is about 1,337 feet from runway 30's threshold.]

Two on duty HIO air traffic controllers reported observing the airplane arrive. One of the controllers indicated that the airplane touched down in front of the tower on runway 30 near the intersection of taxiway A-6. The second controller reported observing water spraying off the airplane's main landing gear when it passed the tower by taxiway A-6. This controller also stated that the airplane appeared to be travelling a little faster than usual. [The intersection of runway 30 and taxiway A-6 is located about 1,881 feet from runway 30's threshold.]

Based upon these reported touchdown locations, the maximum and minimum runway length available for the airplane to decelerate was about 5,900 and 4,649 feet, respectively.

Tire Examination

The tires were examined by a representative from Goodyear Tire. The tires are numbered as follows: #1, left outboard wheel; #2 left inboard wheel; #3 right inboard wheel; and #4 right outboard wheel.

No evidence of tire failure was noted. All of the tires were found inflated. The tread depth in all tires was measured, and in no case was the depth less than about 1/32-inch. No evidence of bulging or chord was showing on any tire.

Tire # 1, 3 and 4 had the least tread depth, ranging between 1/32- to 3/32-inches. Tire # 2 had the most tread depth, ranging from 2/32- to 4/32 inches.

Tire #2 exhibited two areas of reverberated rubber hydroplaning. No such evidence was observed on any other tire.

Tire Air Pressure

The tires' air pressure was not ascertained until February 2, 2011. On this date the nose tire was found inflated to 100 pounds/square inch (psi). The main tires were found at 119, zero, 119, and 50 psi, respectively (left outboard, left inboard, right inboard, and right outboard). Mechanics reported that tires of this design may lose 10 psi/month.

Landing Gear Squat Switches

The antiskid system is precluded from activating unless the squat switch indicates that the airplane has weight on its wheels and the gear strut is compressed to a prescribed level. Additional activation components relate to the positioning of the switch on the gear strut.

An examination of the squat switch was accomplished and the switch was found internally

functional. In addition, no anomalies were found regarding its positioning on the gear strut.

Brake System, Normal

The brakes and hydraulic brake activation system was examined. The brakes were found within limits and no anomalies were found. The brake wear measurements were found to be 0.200, 0.200, 0.280, and 0.300 respectively (left outboard, left inboard, right inboard, and right outboard).

Antiskid System

The antiskid system components were removed from the airplane and sent to the manufacturers facilities for functional tests in accordance with the pertinent engineering specifications or overhaul manuals. The test results and specifications are in the public docket for this accident.

Both left and right control valves tested within the requirements of Learjet Engineering specification LJL-515-B.

The antiskid system control box tested within specifications.

The four wheel speed sensors were tested in accordance with the manufacturers overhaul manual 40-433. All 4 met the electrical resistance specification. For units 1, 2 and 3, the output voltages exceeded the minimum specified voltages for each of the listed frequencies. Unit number 4 was frozen and could not be rotated and thus could not be tested. Sensors 1 and 2 exceeded the specified 15% maximum to minimum voltage variation limit. Sensor number 3 was within the limit and number 4 could not be tested.

Hydroplaning Information

Federal Aviation Administration publication FAA-H-8083-3A, "Airplane Flying Handbook", discusses hydroplaning. Hydroplaning is a condition that can exist when an airplane is landed on a runway surface contaminated with standing water, slush, and/or wet snow. Hydroplaning can have serious adverse effects on ground controllability and braking efficiency. The three basic types of hydroplaning are dynamic hydroplaning, reverted rubber hydroplaning, and viscous hydroplaning. Any one of the three can render an airplane partially or totally uncontrollable anytime during the landing roll.

Dynamic Hydroplaning

Dynamic hydroplaning is a relatively high-speed phenomenon that occurs when there is a film of water on the runway that is at least one-tenth inch deep. As the speed of the airplane and the depth of the water increase, the water layer builds up an increasing resistance to displacement, resulting in the formation of a wedge of water beneath the tire. At some speed, termed the hydroplaning speed (VP), the water pressure equals the weight of the airplane and the tire is lifted off the runway surface. In this condition, the tires no longer contribute to directional control and braking action is nil.

Dynamic hydroplaning is related to tire inflation pressure. Data obtained during hydroplaning tests have shown the minimum dynamic hydroplaning speed (VP) of a tire to be 8.6 times the square root of the tire pressure in pounds per square inch (PSI). For the accident airplane's main tire pressure of 160 pounds, the calculated hydroplaning speed would be approximately 109 knots. It is important to note that the calculated speed referred to above is for the start of dynamic hydroplaning. Once hydroplaning has started, it may persist to a significantly slower

speed depending on the type being experienced.

Reverted Rubber Hydroplaning

Reverted rubber (steam) hydroplaning occurs during heavy braking that results in a prolonged locked-wheel skid. Only a thin film of water on the runway is required to facilitate this type of hydroplaning.

The tire skidding generates enough heat to cause the rubber in contact with the runway to revert to its original uncured state. The reverted rubber acts as a seal between the tire and the runway, and delays water exit from the tire footprint area. The water heats and is converted to steam which supports the tire off the runway.

Reverted rubber hydroplaning frequently follows an encounter with dynamic hydroplaning, during which time the pilot may have the brakes locked in an attempt to slow the airplane. Eventually the airplane slows enough to where the tires make contact with the runway surface and the airplane begins to skid. The remedy for this type of hydroplane is for the pilot to release the brakes and allow the wheels to spin up and apply moderate braking. Reverted rubber hydroplaning is insidious in that the pilot may not know when it begins, and it can persist to very slow groundspeeds (20 knots or less).

Viscous Hydroplaning

Viscous hydroplaning is due to the viscous properties of water. A thin film of fluid no more than one thousandth of an inch in depth is all that is needed. The tire cannot penetrate the fluid and the tire rolls on top of the film. This can occur at a much lower speed than dynamic hydroplane, but requires a smooth or smooth acting surface such as asphalt or a touchdown area coated with the accumulated rubber of past landings. Such a surface can have the same friction coefficient as wet ice.

History of Flight

Landing-flare/touchdown	Landing area overshoot (Defining event)
Landing-landing roll	Runway excursion
	Collision with terr/obj (non-CFIT)
	Landing gear collapse

Pilot Information

Certificate:	Airline Transport	**Age:**	56, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With Waivers/Limitations	**Last Medical Exam:**	09/01/2010
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	09/19/2010
Flight Time:	6000 hours (Total, all aircraft), 23 hours (Last 90 days, all aircraft), 18 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Commercial	**Age:**	34, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With Waivers/Limitations	**Last Medical Exam:**	07/20/2010
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	05/07/2010
Flight Time:	652 hours (Total, all aircraft), 10 hours (Total, this make and model), 220 hours (Pilot In Command, all aircraft), 10 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	GATES LEAR JET	**Registration:**	N25PJ
Model/Series:	25B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	111
Landing Gear Type:	Tricycle	**Seats:**	7
Date/Type of Last Inspection:	07/29/2010, AAIP	**Certified Max Gross Wt.:**	15000 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Jet
Airframe Total Time:	8453 Hours	**Engine Manufacturer:**	GE
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	CJ610-6
Registered Owner:	PREMIER JETS INC	**Rated Power:**	2950 hp
Operator:	PREMIER JETS INC	**Air Carrier Operating Certificate:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	CMWA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	HIO, 208 ft msl	**Observation Time:**	1553 PST
Distance from Accident Site:	0 Nautical Miles	**Direction from Accident Site:**	
Lowest Cloud Condition:		**Temperature/Dew Point:**	9°C / 8°C
Lowest Ceiling:	Overcast / 1300 ft agl	**Visibility**	2 Miles
Wind Speed/Gusts, Direction:	8 knots, 190°	**Visibility (RVR):**	
Altimeter Setting:	29.76 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	Moderate - Rain; Mist		
Departure Point:	Boise, ID (BOI)	**Type of Flight Plan Filed:**	IFR
Destination:	Portland, OR (HIO)	**Type of Clearance:**	IFR
Departure Time:	1545 MST	**Type of Airspace:**	

Airport Information

Airport:	Portland-Hillsboro (HIO)	**Runway Surface Type:**	Asphalt
Airport Elevation:	208 ft	**Runway Surface Condition:**	Wet
Runway Used:	30	**IFR Approach:**	VOR/DME
Runway Length/Width:	6600 ft / 150 ft	**VFR Approach/Landing:**	Full Stop

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	45.551111, -122.960833 (est)

Administrative Information

Investigator In Charge (IIC):	Wayne R Pollack	**Adopted Date:**	03/26/2013
Additional Participating Persons:	Bruce Stephanson; Federal Aviatioin Administration; Portland, OR Mark A Siebert; Bombardier Aerospace/LearJet; Wichita, KS		
Publish Date:	03/26/2013		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=77847		