



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Laramie, WY	<b>Accident Number:</b>	DEN07LA101
<b>Date &amp; Time:</b>	06/20/2007, 1620 MDT	<b>Registration:</b>	N253GL
<b>Aircraft:</b>	Beech 1900D	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	11 None
<b>Flight Conducted Under:</b>	Part 121: Air Carrier - Scheduled		

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## Analysis

The airplane landed long, bounced, and touched down again. The captain tried to slow down and turn the airplane off the runway on to a taxiway at high speed. During the turn attempt, the airplane departed the runway and the airplane's right propeller struck the top of an electrical box that powered the runway approach lighting system. One propeller blade broke off at the hub and struck the right side of the airplane fuselage causing a 17-inch gash which penetrated into the passenger cabin. An examination of the airplane's systems revealed no anomalies.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper decision, his misjudgment of his speed and distance, and his failure to perform a go-around resulting in the airplane overrunning the runway and striking an electrical box. Factors contributing to the accident were the failure of the crew to perform proper crew resource management, the first officer's failure to intervene before the accident occurred, and the electrical box.

## Findings

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Occurrence #1: OVERRUN

Phase of Operation: LANDING

### Findings

1. (C) DISTANCE/SPEED - MISJUDGED - PILOT IN COMMAND
2. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
3. (C) GO-AROUND - NOT PERFORMED - PILOT IN COMMAND
4. (F) CREW/GROUP COORDINATION - NOT PERFORMED - FLIGHTCREW
5. (F) REMEDIAL ACTION - NOT PERFORMED - COPILOT/SECOND PILOT

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Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT

Phase of Operation: LANDING - ROLL

### Findings

6. (F) OBJECT - AIRPORT FACILITY

## Factual Information

### HISTORY OF FLIGHT

On June 20, 2007, at 1620 mountain daylight time, a Beech 1900D, N253GL, operating as Great Lakes Air Flight 174 (GLA 174), was substantially damaged when its right propeller struck an electrical box during a high speed turn off of the runway after landing at the Laramie Regional Airport (LAR), Laramie, Wyoming. Visual meteorological conditions prevailed at the time of the accident. The Title 14 Code of Federal Regulation Part 121 scheduled domestic passenger flight from Worland, Wyoming, to LAR was operating on an instrument flight rules flight plan. The captain, first officer and 9 passengers on board were not injured. The flight originated at 1533.

The company reported that the accident occurred while landing on runway 12 (6,303 feet by 100 feet, dry, asphalt) at LAR. The crew was on the third day of a three-day trip, that had started in Cortez, Colorado, that morning at 0520. The crew had flown from Cortez to Denver, Colorado, to Farmington, New Mexico, back to Denver, then to Laramie, and then to Worland.

The captain reported he had planned a visual straight-in approach to the runway. He said the approach and landing was to be performed based on a landing weight of 13,847 pounds with wing flaps at 35 degrees, an approach speed of 121 knots, and a reference of final approach to landing speed ( $V_{ref}$ ) of 111 knots. The captain said that on short final, the speed was 125 knots and that they were "one dot high" on the approach. He said that on rounding out, he reduced power and placed both hands on the control yoke to have better control of the airplane as there had been some light turbulence. He said this resulted in some excessive floating, though the airplane did touch down softly on the right main tire approximately 2,500 feet down from the runway threshold. The captain said the airplane bounced slightly back into the air. The captain flew the airplane back onto the ground touching both main tires down approximately 1,000 feet further down the runway and just as the airplane passed the intersection of runway 3-21. The captain said, "I continued to ease the nose gear down and then realized that the end of the runway was coming up at an excessive rate." The captain said he applied the brakes, which had a moderate effect. "With 1,500 feet [of runway] remaining, I applied the brakes more, at which point I realized that the aircraft was not going to stop prior to the end of the runway. I tried to turn off at the last taxiway as a last ditch effort, but the aircraft began to skid." The captain said that at that point it was apparent that the airplane was going to go off the end of the runway. The captain said he wanted to have as much control as possible so as to not hit anything. He was successful in missing the lights, but was unable to avoid striking an orange control box with the right propeller.

The first officer reported that they were a little high on final approach. He said that as they were on short final, "The PAPI (Precision Approach Path Indicator - lights) showed 3 white lights and 2 red lights. However the approach was very stable." The first officer said that as the captain was flaring the airplane, "the aircraft ballooned a bit, then the mains (main landing gear tires) set down but then briefly lifted again." The first officer said the airplane set down again about midway down the runway. He said that at this point, he thought the captain would lower the nose wheel to the runway and apply brakes. He said that it seemed the captain held the nose wheel off the runway for a long time. The first officer said that at this point, he said the captain's name to get his attention. When the captain did lower the nose wheel to the runway, the first officer said he called out the captain's name again to try and get him to slow

down the airplane. "As he (the captain) realized we weren't going to stop by the end of the runway, he attempted to make the last turnoff as a last effort. As we went off the runway there was a loud crack or bang sound. As we taxied back on to the taxiway, I looked out my window and noticed the propeller was oscillating wildly."

The airport manager said the airplane's right propeller struck the top of an electrical box that powers the approach lighting system. A propeller blade then broke off and struck the right side of the airplane's fuselage.

#### PERSONNEL INFORMATION

The captain held an airline transport pilot certificate with single engine and multi-engine land, instrument airplane ratings. The captain also held a first class medical certificate dated February 2007. The medical certificate listed no restrictions or limitations. The captain was hired on April 18, 2005. The company reported the captain as having 2,250 total flying hours, 700 hours in the Beech 1900, and 70 hours within the previous 90 days. The captain had successfully completed a company line check ride on March 10, 2007.

The first officer held a commercial pilot certificate with single engine and multi-engine land, instrument airplane ratings. The first officer also held a first class medical certificate dated August 2006. The medical certificate listed no restrictions or limitations. The first officer was hired on December 30, 2006. The company reported the first officer as having 774 total flying hours, 364 hours in the Beech 1900, and 224 hours within the previous 90 days. The first officer successfully completed a company line check ride on his date of hire, December 30, 2006.

#### AIRCRAFT INFORMATION

The airplane was a Beech 1900D, serial number UE-253, twin engine turboprop-powered airplane with a carrying capacity of two flight crewmembers and 19 passengers and baggage. The airplane was manufactured in 1996 and registered to Great Lakes Aviation, limited, Cheyenne, Wyoming. At the time of the accident, the airplane had 22,520.1 total hours. The airplane had undergone a routine continuous airworthiness inspection on June 18, 2007. The airframe time at the inspection was 22,511.4 hours.

#### METEOROLOGICAL CONDITIONS

The weather conditions for LAR at 1553 were winds variable at 5 knots with gusts to 22 knots. Sky conditions were clear, visibility 10 miles, temperature 84 degrees Fahrenheit (F), dew point 23 degrees F, and an altimeter of 30.31 inches.

The weather conditions at LAR at 1653 were winds variable at 3 knots, clear skies, visibility 10 miles, temperature 82 degrees F, dew point 22 degrees F, and an altimeter of 30.29 inches.

#### FLIGHT RECORDERS

The airplane was equipped with a Cockpit Voice Recorder (CVR) and a Digital Flight Data Recorder (DFDR). Both recorders were removed from the airplane shortly after the accident, and were later sent to the National Transportation Safety Board's Vehicle Recorder Division in Washington, DC, for readout. The recorders were in excellent condition and provided good information.

A CVR Group was formed at NTSB Headquarters on July 12, 2007. The group reviewed the tape recording and developed a CVR transcript.

The CVR recording began at 15:48:55.9. The recording contained events from the approach and landing at LAR as well as the accident event. The recording ended shortly thereafter at 16:20:22.0. The following significant events are taken from the CVR transcript.

At 16:15:43.2, the Salt Lake City Air Traffic Control Center terminated radar service with GLA 174 and cleared them change radio frequency to LAR advisory. The crew was in the process of completing the Landing Checklist.

At 16:18:00.4, the first officer made a radio call to all aircraft monitoring the Laramie Common Air Traffic Frequency (CTAF) stating that they were "five mile final [for landing on] runway one two [at] Laramie."

At 16:18:18.3, the captain called for "flaps seventeen" as per the checklist. The first officer responded, "Speed, check, selected."

At 16:18:27.1, the automated passenger arrival briefing was played over the public address system.

At 16:18:28.1, the captain called for the landing checklist. The first officer began by calling out, "Gear?" The captain responded, "Down, three green." The first officer then called out, "flaps?" The captain responded, "Seventeen." The first officer then called out, "Propellers?" The captain responded, "Full forward."

At 16:18:51.5, the captain called out, "Flaps thirty five, final checks."

At 16:18:51.6, the automated Ground Proximity Warning System announced, "Five hundred."

At 16:18:57.7, the first officer responded to the captain's "final checks" challenge, "Flaps thirty five, yaw damp[ener]'s off, landing check complete, three green, and you're clear to land." The captain responded, "Roger that."

At 16:19:03.3, the first officer made a radio call to all aircraft monitoring the Laramie CTAF, "Laramie traffic, Lakes Air one seventy four, short final, runway one two, Laramie."

At 16:19:12.7, the first officer stated, "Whooh, ahh, there's the cabin." The captain said, "Huh, did we just catch it?" The first officer answered, "Uh, yeah and my uh face hurts." The captain said, "Oh really?" The first officer said, "Yeah, that one really got my sinuses. Uh, that's not a good sign." The captain said, "No, it's not." The first officer then said, "[I'm] gonna have to fight off a cold these next three days."

At 16:19:36.7, the first officer said, "Wow, okay Marvin (the captain's first name)." The DFDR showed that at this time, the airplane was starting the landing roundout and flare. The captain responded, "Oh, it came back up."

At 16:19:47.5, the first officer said, "Uh, uh."

At 16:19:48.4, the CVR recorded a sound similar to main landing gear tires touching down on the runway. The DFDR showed a constant zero altitude at this time.

At 16:19:49.6, the CVR recorded a sound similar to propellers changing pitch.

At 16:19:51.0, the first officer laughed, "Oh man."

At 16:19:52.3, the captain exclaimed, "Oh (expletive), oh (expletive)."

At 16:19:53.8, the first officer said, "... I was nervous about that." Then he exclaimed, "Oh my God. Oh my God Marvin. Oh my God Marvin."

At 16:19:54.3, the CVR recorded the sound of an unknown thump.

At 16:19:55.1, the captain exclaimed, "Uh (expletive), oh (expletive). Oh God, oh God, oh God, oh God (expletive)."

At 16:20:00.0, the CVR recorded the sound of an impact followed by a sound similar to an altitude alert tone, and then a sound similar to a rotating propeller imbalance. This imbalance sound continued to the end of the recording.

#### WRECKAGE AND IMPACT INFORMATION

An examination of the airplane showed that one of the four blades on the right propeller had broken torsionally at the spinner/hub. Two other propeller blades showed tip damage. The right side of the fuselage, abeam the right propeller arc, showed a 17-inch long (approximate to the lateral axis), 11-inch wide (approximate to the longitudinal axis) triangular-shaped gash in the outer skin that penetrated into the inner fuselage structure through into the cabin. Insulation and coating between the outer skin and pressure vessel were torn and displaced. The heating vent and cabin wall molding along the floor at the base of seat 1C was pushed inward approximately 8 inches.

Flight control continuity was confirmed. An examination of the airplane's engines, engines' controls, brakes, steering, and other airplane systems showed no anomalies.

#### MEDICAL AND PATHOLOGICAL INFORMATION

The flight crew was directed to undergo drug testing within 4 hours of the accident. The results of the drug tests of samples provided by the captain and first officer were negative.

#### TESTS AND RESEARCH

On August 28, 2007, the NTSB investigator-in-charge met with company safety officials and corporate officers in Cheyenne, Wyoming, to examine crew personnel and training records and to discuss company culture, operations and training. The discussion showed Great Lakes Airlines requires a Vref call by the non-flying pilot prior to roundout and touchdown. There was concern over the breakdown in crew resource management, particularly that the non-flying pilot failed to assert himself in a way that could have prevented the accident from occurring. There was also concern that no go-around call was made or even considered. The company's Chief Executive Officer (CEO) and safety officials said that they are hiring pilots with less total flying time than in previous years, and that their first officers upgrade faster than other small commuter companies. The CEO said they recognize that when their pilots reach a certain level of experience, they often leave GLA for the larger airline companies. He also said that the pilots they hire are young. He said it's difficult to impart experience and judgment to such a young workforce. Because of these issues, GLA's flight training programs are very rigorous.

#### ADDITIONAL INFORMATION

Parties to the investigation were the Federal Aviation Administration and Great Lakes Aviation, Limited. The flight recorders were returned to Great Lakes Aviation, Limited.

## Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	30, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 None	<b>Last Medical Exam:</b>	02/01/2007
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	2250 hours (Total, all aircraft), 700 hours (Total, this make and model), 70 hours (Last 90 days, all aircraft)		

## Co-Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	26, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 None	<b>Last Medical Exam:</b>	08/01/2006
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	774 hours (Total, all aircraft), 364 hours (Total, this make and model), 224 hours (Last 90 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	Beech	<b>Registration:</b>	N253GL
<b>Model/Series:</b>	1900D	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	UE253
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	21
<b>Date/Type of Last Inspection:</b>	06/01/2007, Continuous Airworthiness	<b>Certified Max Gross Wt.:</b>	17230 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo Prop
<b>Airframe Total Time:</b>	22520.1 Hours	<b>Engine Manufacturer:</b>	Pratt & Whitney
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	PT-6A
<b>Registered Owner:</b>	Great Lakes Aviation, Inc.	<b>Rated Power:</b>	750 hp
<b>Operator:</b>	Great Lakes Aviation, Inc.	<b>Air Carrier Operating Certificate:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>	Great lakes Airlines	<b>Operator Designator Code:</b>	GLAA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	LAR, 7284 ft msl	<b>Observation Time:</b>	1553 MDT
<b>Distance from Accident Site:</b>	1 Nautical Miles	<b>Direction from Accident Site:</b>	300°
<b>Lowest Cloud Condition:</b>	Clear	<b>Temperature/Dew Point:</b>	29° C / -5° C
<b>Lowest Ceiling:</b>	None	<b>Visibility</b>	10 Miles
<b>Wind Speed/Gusts, Direction:</b>	5 knots/ 22 knots, 120°	<b>Visibility (RVR):</b>	
<b>Altimeter Setting:</b>	30.31 inches Hg	<b>Visibility (RVV):</b>	
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Worland, WY (WRL)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Laramie, WY (LAR)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	1533 MDT	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Laramie Regional airport (LAR)	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	7284 ft	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	12	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	6300 ft / 100 ft	<b>VFR Approach/Landing:</b>	Straight-in

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	9 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	11 None	<b>Latitude, Longitude:</b>	41.307500, -105.671111

## Administrative Information

<b>Investigator In Charge (IIC):</b>	David C Bowling	<b>Adopted Date:</b>	12/20/2007
<b>Additional Participating Persons:</b>	Eric Horsemeyer; Federal Aviation Administration; Denver, CO Santee Scheeler; Great Lakes Aviation, Limited; Cheyenne, WY		
<b>Publish Date:</b>			
<b>Investigation Docket:</b>	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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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.

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