



National Transportation Safety Board Aviation Incident Final Report

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|-------------------------|----------------------|-------------------------|------------|
| Location: | Denver, CO | Incident Number: | DEN071A058 |
| Date & Time: | 02/02/2007, 1738 MST | Registration: | N928UA |
| Aircraft: | Boeing 737-522 | Aircraft Damage: | None |
| Defining Event: | | Injuries: | 101 None |

Flight Conducted Under: Part 121: Air Carrier - Scheduled

Analysis

The snowplow driver had been plowing snow on an airport service road. When he finished, the driver departed for another area of the airport that needed plowing, which required crossing a taxiway and active runway. The driver stopped short of the taxiway, but without ATC or airport operations clearance, crossed the runway. The driver saw a landing airplane as he was crossing the runway and increased acceleration. The flight crew saw the snowplow holding short of the taxiway. They landed, but during the landing roll, they saw the snowplow cross in front of them. "Significant" reverse thrust and brakes were used to bring the aircraft to a halt on the runway. The ground controller did not see the snowplow, but was alerted to the runway incursion by the flight crew's report. The Airport Movement Area Safety System (AMASS) was operational, but no alarm sounded.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The snowplow driver's failure to follow procedures/directives by crossing an active runway without clearance, resulting in a runway incursion and near collision with an airplane during its landing roll.

Findings

Occurrence #1: MISCELLANEOUS/OTHER
Phase of Operation: LANDING - ROLL

Findings

1. AIRPORT EQUIPMENT, SNOW REMOVAL - OTHER
2. (C) PROCEDURES/DIRECTIVES - NOT FOLLOWED - DRIVER OF VEHICLE

Factual Information

HISTORY OF FLIGHT

On February 2, 2007, at 1738 mountain standard time, a Boeing 737-522, N928UA, operated by United Air Lines, Inc., as flight 1193, and piloted by an airline transport certificated pilot, nearly collided with a snowplow after landing at Denver International Airport (DEN), Denver, Colorado. Visual meteorological conditions prevailed at the time of the incident. The scheduled domestic passenger flight was being conducted under the provisions of Title 14 CFR Part 121, and an instrument flight rules (IFR) flight plan had been filed and activated. The captain, first officer, 3 flight attendants, and 96 passengers were not injured. The flight originated at Billings, Montana, approximately 1628.

The investigation revealed that the snow plow had been plowing snow on Great Rock Road, an Aircraft Rescue and Fire Fighting (ARFF) service road, and was en route to fire station no. 2, located northwest of the runway 08 threshold. The driver stopped short of taxiway R. Without clearance from air traffic control or airport operations, he proceeded across the runway. The driver said he saw the landing airplane as he was crossing the runway and increased acceleration.

According to the airport operations manager, the snowplow driver told the operations supervisor (OPS-9), who had previously escorted the snowplow, that he wanted to make a second pass over Great Rock Road before proceeding to fire station no. 2. "OPS-9 acknowledged and then began driving west on taxiway R, expecting to see the snowplow coming westbound on 98th street (south and parallel to taxiway R). After driving approximately 100 yards, OPS-9 began looking for, and finally saw, the snowplow on the north end of Great Rock Road at the edge of runway 8-26. Before OPS-9 could attempt radio contact, the plow driver...drove onto runway 8-26 directly in front of United 1193 that had just landed."

According to statements submitted by the flight crew, they saw the snowplow holding short of the taxiway. They landed and during the rollout, they observed the snowplow cross the runway in front of them. "Significant" reverse thrust and brakes were used to bring the aircraft to a halt on the runway.

The ground controller in the control tower said he did not see the snow plow. He was alerted to the runway incursion by the flight crew's report. He stated that the Airport Movement Area Safety System (AMASS) was operational but no alarm sounded.

PERSONNEL (CREW) INFORMATION

The captain, age 40, held an airline transport pilot certificate, dated November 20, 2006, with an airplane multiengine land rating, and type ratings in the Boeing 737, 757, 767 and Beech 1900 (circle approach VMC only). He also held a flight instructor certificate, dated May 18, 1998, with airplane single-engine, multiengine, and instrument ratings, and a flight engineer certificate, dated November 26, 1996, with a turbojet rating. His first class airman medical certificate, dated December 11, 2006, contained the restriction, "Must wear corrective lenses." According to United Airlines, the captain had accrued 6,975 total flight hours, of which 2,544 hours were in the Boeing 737-500.

The first officer, age 38, held an airline transport pilot certificate, dated April 28, 2006, with an airplane multiengine land rating, type ratings in the Boeing 707, 720, and 737 (second-in-command privileges only), and commercial privileges in airplanes single-engine land. His first class airman medical certificate, dated March 8, 2006, contained the restriction, "Must wear corrective lenses." According to United Airlines, the pilot he had accrued 2,084 total flight hours, of which 942 hours were in the Boeing 737-500.

The snow plow driver, age 42, was employed by Denver International Airport in 2004. In 2005, he became red stripe badge-certified --- that is, his airport identification badge had red diagonal stripes across the front, signifying his qualification to drive on airport movement areas, but only with prior approval from airport operations. To attain this badge, the employee must satisfactorily complete a prescribed training program, pass a written examination, take a familiarization ride, and pass a practical. In 2006, the driver's access was changed and he received a more restrictive blue LAR (limited access route) identification badge. He was allowed to drive only on specific routes and cross certain taxiways. He could not drive in a movement area unless escorted. At the time of the incident, he held the blue LAR badge.

The operations supervisor (OPS-9), age 50, previously a City of Denver employee, was employed by the airport in early 2006. Six months later, after satisfactorily completing the prescribed training course and taking a written and practical test, he became red badge-certified. This identification badge allowed him to drive on any portion of the airport property. At the time of the incident, he held red badge authority.

METEOROLOGICAL INFORMATION

An automated weather observation station (AWOS) observation, taken at DEN at 1653, was as follows: Wind, 260 degrees at 13 knots; visibility, 10 statute miles (or greater); sky condition, few clouds at 9000 feet; ceiling, 14,000 feet broken, 25,000 feet broken; temperature, -5 degrees Celsius (C.); dew point, -16 degrees C.; altimeter setting, 29.74 inches of mercury.

AERODROME INFORMATION

Denver International Airport, located 16 miles northeast of Denver, is situated at an elevation of 5,431 feet msl (above mean sea level). It has six runways. Runway 08-26 is 12,000 feet x 150 feet, of concrete construction, and is located north of runways 17-35 L/R, and is east of runways 16-34 L/R. The average snowfall for February is 4.5 inches.

MEDICAL AND PATHOLOGICAL INFORMATION

A toxicology screen performed on both the snowplow driver and the operations supervisor was negative for alcohol and drugs.

ADDITIONAL INFORMATION

Other than the Federal Aviation Administration, there were no other parties to the

investigation.

The airplane was verbally released back to United Air Lines on February 2, 2007.

Pilot Information

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|----------------------------------|---|--|----------------------------|
| Certificate: | Airline Transport | Age: | 40, Male |
| Airplane Rating(s): | Multi-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): | None | Toxicology Performed: | No |
| Medical Certification: | Class 1 Unknown | Last Medical Exam: | 12/01/2006 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | 11/01/2006 |
| Flight Time: | 6975 hours (Total, all aircraft), 2544 hours (Total, this make and model), 241 hours (Pilot In Command, all aircraft), 116 hours (Last 90 days, all aircraft), 63 hours (Last 30 days, all aircraft), 9 hours (Last 24 hours, all aircraft) | | |

Co-Pilot Information

| | | | |
|----------------------------------|---|--|----------------------------|
| Certificate: | Commercial | Age: | 38, Male |
| Airplane Rating(s): | Multi-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 Unknown | Last Medical Exam: | 03/01/2006 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | 01/01/2007 |
| Flight Time: | 2084 hours (Total, all aircraft), 942 hours (Total, this make and model), 167 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 9 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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|-------------------------------|--------------------------------------|------------------------------------|--------------------|
| Aircraft Manufacturer: | Boeing | Registration: | N928UA |
| Model/Series: | 737-522 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Transport | Serial Number: | 26651 |
| Landing Gear Type: | Retractable - Tricycle | Seats: | 117 |
| Date/Type of Last Inspection: | 01/01/2007, Continuous Airworthiness | Certified Max Gross Wt.: | 122500 lbs |
| Time Since Last Inspection: | | Engines: | 2 Turbo Jet |
| Airframe Total Time: | 40506 Hours | Engine Manufacturer: | General Electric |
| ELT: | Not installed | Engine Model/Series: | CFM56-3-B1 |
| Registered Owner: | United AirLines, Inc. | Rated Power: | lbs |
| Operator: | United AirLines, Inc. | Air Carrier Operating Certificate: | Flag carrier (121) |
| Operator Does Business As: | | Operator Designator Code: | UALA |

Meteorological Information and Flight Plan

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|----------------------------------|----------------------------------|------------------------------|-------------------|
| Observation Facility, Elevation: | DEN, 5431 ft msl | Observation Time: | 1753 MST |
| Distance from Accident Site: | | Condition of Light: | Night |
| Direction from Accident Site: | | Conditions at Accident Site: | Visual Conditions |
| Lowest Cloud Condition: | Few / 9000 ft agl | Temperature/Dew Point: | -5 °C / -16 °C |
| Lowest Ceiling: | Broken / 14000 ft agl | Visibility | 10 Miles |
| Wind Speed/Gusts, Direction: | 13 knots, 260° | Visibility (RVR): | |
| Altimeter Setting: | 29.74 inches Hg | Visibility (RVV): | |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Billings, MT (BIL) | Type of Flight Plan Filed: | IFR |
| Destination: | Denver, CO (DEN) | Type of Clearance: | IFR |
| Departure Time: | 1628 MST | Type of Airspace: | |

Airport Information

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|----------------------|------------------------------------|---------------------------|----------|
| Airport: | Denver International Airport (DEN) | Runway Surface Type: | Concrete |
| Airport Elevation: | 5431 ft | Runway Surface Condition: | Unknown |
| Runway Used: | 26 | IFR Approach: | ILS |
| Runway Length/Width: | 12000 ft / 150 ft | VFR Approach/Landing: | None |

Wreckage and Impact Information

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|----------------------------|----------|----------------------------|------|
| Crew Injuries: | 5 None | Aircraft Damage: | None |
| Passenger Injuries: | 96 None | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 101 None | | |

Administrative Information

Investigator In Charge (IIC): Arnold W Scott **Adopted Date:** 07/25/2007

Additional Participating Persons: Max Tidwell; FAA ANM; Renton, WA

Publish Date:

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.

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