Aviation Investigation Final Report

Location:	Butler, Pennsylvania	**Accident Number:**	NYC07FA058
Date & Time:	January 24, 2007, 09:05 Local	**Registration:**	N492AT
Aircraft:	Cessna 550	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 3 Minor
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The Citation 550 was being repositioned for an air ambulance transportation flight, and was on approach to land on a 4,801-foot-long, grooved, asphalt runway. The airplane was being flown manually by the copilot, who reported that the landing approach speed (Vref) was 106 knots. The pilot-in-command (PIC) estimated that the airplane "broke out" of the clouds about two miles from the runway. Both pilots stated that the airplane continued to descend toward the runway, while on the glide slope and localizer. Neither pilot could recall the airplane's touchdown point on the runway, or the speed at touchdown. Witnesses observed the airplane, "high and fast" as it crossed over the runway threshold. The airplane touched down about halfway down the runway, and continued off the departure end. It then struck a wooden localizer antenna platform, and the airport perimeter fence, before crossing a road, and coming to rest about 400 feet from the end of the runway. Data downloaded from the airplane's Enhanced Ground Proximity Warning System (EGPWS) revealed that the airplane's groundspeed at touchdown was about 140 knots. Review of the cockpit voice recorder suggested that the PIC failed to activate the airplane's speed brake upon touchdown. Braking action was estimated to be "fair" at the time of the accident, with about 1/4 to 1/2 inches of loose, "fluffy" snow on the runway. The PIC reported that he thought the runway might be covered with an inch or two of snow, which did not concern him. The copilot reported encountering light snow during the approach. Both pilots stated that they were not aware of any mechanical failures, or system malfunctions during the accident; nor were any discovered during post accident examinations. According to the airplane flight manual, the conditions applicable to the accident flight prescribed a Vref of 110 knots, with a required landing distance on an uncontaminated runway of approximately 2,740 feet. The prescribed landing distance on a runway contaminated with 1-inch of snow, at a Vref of 110 knots was approximately 5,800 feet. At Vref + 10 knots, the required landing distance increased to about 7,750 feet.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The copilot's failure to maintain the proper airspeed, and failure to obtain the proper touchdown point, and the pilot-in-command's inadequate supervision, which resulted in an overrun. Contributing to the accident was the PIC's failure to activate the speed brake upon touchdown and the snow contaminated runway.

Findings

Occurrence #1: OVERRUN
Phase of Operation: LANDING

Findings
1. (F) TERRAIN CONDITION - SNOW COVERED
2. (C) PROPER TOUCHDOWN POINT - NOT OBTAINED - COPILOT/SECOND PILOT
3. (F) FLT CONTROL SYST,SPEED BRAKE SYSTEM - NOT ACTIVATED
4. (C) AIRSPEED(VREF) - NOT MAINTAINED - COPILOT/SECOND PILOT
5. (C) SUPERVISION - INADEQUATE - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ROLL

Findings
6. OBJECT - APPROACH LIGHT/NAVAID

Factual Information

HISTORY OF FLIGHT

On January 24, 2007, about 0905 eastern standard time, a Cessna 550, N492AT, operated by Air Trek Inc., was substantially damaged while landing at the Butler County Airport (BTP), Butler, Pennsylvania. The certificated airline transport rated pilot was seriously injured. The certificated airline transport rated copilot and two passengers sustained minor injuries. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan had been filed for the flight that departed the Winchester Regional Airport (OKV), Winchester, Virginia, about 0820. The positioning flight was conducted under 14 Code of Federal Regulations (CFR) Part 91.

The purpose of the flight was to pick up a patient for a subsequent air ambulance transportation flight, to be conducted under 14 CFR Part 135. The airplane was being flown by the copilot, who was seated in the left seat. The pilot in the right seat was the designated pilot-in-command (PIC) of the flight. Both pilots reported that the taxi, takeoff and en route portion of the flight were normal, with the exception of a problem with the autopilot's altitude hold function, which oscillated around the selected altitude.

According to Federal Aviation Administration (FAA) air traffic control communications, at 0859, the airplane was cleared for the instrument landing system approach to runway 8, a 4,801-foot-long, 100-foot-wide, grooved, asphalt runway. At 0902, the flightcrew reported that the airport was in sight and cancelled their IFR flight plan.

The airplane was being manually flown by the copilot; who stated that the landing approach speed (Vref) was 106 knots. She recalled being "a little fast" on the approach; however, she reduced the engine power to slow down. The PIC estimated that the airplane "broke out" of the clouds about two miles from the runway. Both pilots stated that the airplane continued to descend toward the runway, while on the glide slope and localizer. Neither pilot could recall the airplane's touchdown point on the runway, or the speed at touchdown. They recalled the airplane rolling out, and felt it was not decelerating. When asked, the PIC stated he considered aborting the landing; however there was insufficient runway remaining. Both pilots stated that they were not aware of any mechanical failures, or system malfunctions during the accident.

The airplane rolled off the end of runway 8. It then struck a wooden localizer antenna platform, and the airport perimeter fence, before crossing a road, and coming to rest about 400 feet from the end of the runway.

The airport manager and the pilot of a Cessna 560XL, were on their way out to runway 8, to conduct a braking action check, when they observed the accident airplane on approach. They

stated that the airplane appeared "high and fast" as it crossed over the runway threshold. The airplane touched down about halfway down the runway, and continued off the departure end. A braking action check was subsequently conducted, and the airport manager estimated that braking action was "fair" at the time of the accident, with about 1/4 to 1/2 inches of loose, "fluffy" snow on the runway.

PERSONNEL INFORMATION

The PIC, age 62, was hired by Air Trek during March 2005. He held an airline transport pilot certificate, with ratings for single and multiengine land airplanes. He also held a commercial pilot certificate, with ratings for single engine seaplanes and rotorcraft, and an instrument rating for airplanes and rotorcraft. The PIC held type ratings for the Jetstream BA-3100, Westwind IA, and Cessna 500 series airplanes. He also held a flight instructor certificate, with ratings for single, and multiengine airplanes, and instrument airplane. The company reported that he had accumulated 22,700 hours of total flight experience, which included 1,200 hours in the same make and model as the accident airplane. In addition, the pilot had accumulated 139 hours of total flight experience, and 42 hours of total flight experience, in make and model during the 90 and 30 days that preceded the accident; respectively.

The PIC's most recent application for an FAA first class medical certificate, was issued on October 23, 2006.

The copilot, age 42, was hired by Air Trek during August 2006. She held an airline transport pilot certificate, with ratings for single and multiengine land airplanes. She also held an instrument rating. The copilot received a Cessna 500 series type rating about 1 month prior to the accident. The company reported that she had accumulated 1,951 hours of total flight experience, which included 110 hours in the same make and model as the accident airplane. In addition, the copilot had accumulated 110 hours of flight experience, and 31 hours of total flight experience in make and model during the 90 and 30 days that preceded the accident, respectively.

The copilot's most recent application for an FAA first class medical certificate, was issued on July 12, 2006.

AIRCRAFT INFORMATION

The airplane was manufactured in 1983, and was equipped with two Pratt and Whitney Canada JT15D-4 engines. At the time of the accident, it had accumulated approximately 10,735.4 total hours of operation. The airplane was maintained in accordance with an approved manufacturer inspection program. It had undergone a phase 1 and 2 check on January 9, 2007, about 65 hours prior to the accident. The airplane was not equipped with thrust reversers.

METEOROLOGICAL INFORMATION

A weather observation taken at BTP, at 0855, reported: winds from 220 degrees at 3 knots; visibility 2 1/2 miles; few clouds at 100 feet, ceiling 1,100 feet broken, 1,700 feet overcast; temperature -2 degrees Celsius (C), dew point -5 degrees C; altimeter 30.02 inches of mercury.

The following notices to airman (NOTAMS) were issued for BTP:

January NOTAM #31: Patchy thin snow and ice on runway effective from January 23, 2007, at 1338.

January NOTAM#32: Braking action fair effective from January 23, 2007, at 1338.

The PIC reported that he thought the runway might be covered with an inch or two of snow, which did not concern him. The copilot reported encountering light snow during the approach.

AERODROME INFORMATION

Butler County Airport was positioned at 40 degrees, 46 minutes, 36.96 seconds, north latitude; 79 degrees, 56 minutes, 58.96 seconds, west longitude, at an elevation of 1248 feet above sea level.

Runway 8-26, was 4,801-feet-long, 100-feet-wide, and constructed of grooved asphalt. Runway 8 was equipped with an instrument landing system (ILS), and a medium intensity approach lighting system, with runway alignment indicator lights. It was also equipped with a visual approach slope indicator (VASI).

FLIGHT RECORDERS

The airplane was equipped with a Fairchild A100 cockpit voice recorder (CVR), which was forwarded to the National Transportation Safety Board's Vehicle Recorders Laboratory, Washington, DC. A CVR group convened on February 15, 2007, and a complete transcript was prepared for the entire 30-minute, 23-second tape recording.

Review of the CVR transcript revealed a sound similar to the autopilot disconnect, which was recorded at 0903:16.

At 0903:19, the PIC stated, "'kay, on glide path, on glideslope."

At 0903:23, the PIC stated, "watch your rate of descent. you're gonna go right through it."

At 0903:29, the PIC stated, "and I'd really bring your power back. you're awfully fast."

At 0903:49, the PIC stated "'kay, 'kay, you're uh, okay."

At 0903:55, EGPWS reported sink rate, five hundred sink rate.

At 0904:14, the PIC stated "okay."

At 0904:15, the copilot stated "flaps full."

At 0904:16, the PIC stated, "full flaps, 'kay really get the power back here...you're really fast."

At 0904:20, the copilot indicated that she could see the runway.

At 0904:23, the PIC stated, now expect it to be icy and slippery okay so..."

At 0904:26, the copilot stated, "okay," which was followed by the PIC stating "speed control is critical here."

At 0904:29, the PIC stated, "power should be all the way off."

Also at 0904:29, the EGPWS reported sink rate, pull up, sink rate, sink rate.

At 0904:42, the PIC stated, "okay, go a...okay brake, brake."

At 0904:44, the copilot stated, "'kay, braking. do you wanna help? 'kay, 'cause I don't..."

At 0904:46, the PIC stated, "no, brake, brake, brake, brake."

At 0904"48, the copilot stated, I'm braking...do you have the speed brakes?"

At 0904:50, the PIC stated "..oh, I'm sorry, yeah."

At 0904:51, the PIC stated, "..we're gonna go off the runway."

The sound of impact was recorded at 0905:00.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest upright, on a magnetic heading of 025-degrees. A portion of the airport perimeter fence was wrapped around the left wing, extending forward around the nose, onto the right wing, and around the right main landing gear. The spoilers were deployed, and the flaps were observed in a landing position. Damage consistent with impact with the wooden localizer platform was observed on all leading edge surfaces, the nose section, and both engines. An outboard portion of the right wing was consumed by fire; and soot was observed on the right side of the airplane, aft of the right wing. The empennage was partially separated, and canted aft and downward approximately 40-inches forward of the aft edge of the tail cone. Rudder control continuity was observed from the rudder pedals in the cockpit to the rudder control surface. Elevator control continuity was observed from the aft pressure bulkhead, to

the central elevator horn. Due to impact damage, complete aileron continuity could not be confirmed.

The left main landing gear was separated and located near the left wing. The right main landing gear was displaced upward, into the right wing, and the nose gear was folded aft, and to the right. No flat spots were observed on any of the landing gear tire treads. Examination of the left and right brake transducers revealed their respective "clips" were intact and they rotated freely.

Neither engine exhibited evidence of any pre-impact failures. The left engine compressor rotated freely, and continuity was observed through the turbine section. The right engine could not be rotated; however, wood was observed lodged in the compressor section and wooden particles were observed in the engine's tail cone.

TESTS AND RESEARCH

Examination of the airplane's anti-skid control box, at Crane Hydro-Aire, Burbank, California, under the supervision of an Safety Board investigator did not reveal any preimpact malfunctions.

The airplane was equipped with a Bendix King KMH 820, Enhanced Ground Proximity Warning System (EGPWS) computer. The data stored in the unit was downloaded at Honeywell International, Redmond, Washington, under the supervision of an FAA inspector. The data revealed the airplane's groundspeed at touchdown was about 140 knots.

ADDITIONAL INFORMATION

Airplane Performance

According to information provided by the aircraft manufacturer, and using the conditions applicable to the accident flight, the airplane flight manual (AFM) prescribed a Vref of 110 knots, with a required landing distance on an uncontaminated runway of approximately 2,740 feet. Section 7, of the AFM prescribed landing distance adjustments required for landings on contaminated runways. The required landing distance on a runway contaminated with 1-inch of snow, at a Vref of 110 knots was approximately 5,800 feet. At Vref + 10 knots, the required landing distance increased to about 7,750 feet.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	62,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	October 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 1, 2005
Flight Time:	22700 hours (Total, all aircraft), 1200 hours (Total, this make and model), 139 hours (Last 90 days, all aircraft), 42 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Commercial	**Age:**	42,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	July 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 1, 2006
Flight Time:	1951 hours (Total, all aircraft), 110 hours (Total, this make and model), 122 hours (Last 90 days, all aircraft), 31 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N492AT
Model/Series:	550	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	550-0472
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	January 1, 2007 Continuous airworthiness	**Certified Max Gross Wt.:**	14500 lbs
Time Since Last Inspection:	65 Hrs	**Engines:**	2 Turbo fan
Airframe Total Time:	10735 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, not activated	**Engine Model/Series:**	JT15D-4
Registered Owner:	AIR TREK INC	**Rated Power:**	2500 Lbs thrust
Operator:		**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	FDIA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BTP,1248 ft msl	**Distance from Accident Site:**	
Observation Time:	08:55 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Few / 100 ft AGL	**Visibility**	2.5 miles
Lowest Ceiling:	Broken / 1100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	-2°C / -5°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Winchester, VA (OKV)	**Type of Flight Plan Filed:**	IFR
Destination:	Butler, PA (BTP)	**Type of Clearance:**	IFR
Departure Time:	08:20 Local	**Type of Airspace:**	

Airport Information

Airport:	Butler County BTP	**Runway Surface Type:**	Asphalt
Airport Elevation:	1248 ft msl	**Runway Surface Condition:**	Snow
Runway Used:	8	**IFR Approach:**	ILS;Visual
Runway Length/Width:	4801 ft / 100 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 3 Minor	**Latitude, Longitude:**	40.778888,-79.94139

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	Christine K Soucy; FAA AAI-100; Washington, DC Steve M Miller; Cessna Aircraft Company; Wichita, KS
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Last Revision Date:	
Investigation Class:	Class
Note:	
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