National Transportation Safety Board
Aviation Accident Final Report

Location:	Bridgewater, VA	**Accident Number:**	NYC08LA323
Date & Time:	09/25/2008, 1715 EDT	**Registration:**	N30W
Aircraft:	BEECH A200	**Aircraft Damage:**	Substantial
Defining Event:	Runway excursion	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Flight Test		

Analysis

The pilot, an employee of the United States Department of Interior (DOI), was conducting a post-maintenance test flight of the airplane, which was on long term lease to the DOI. For the flight, despite the presence of drizzle, a tailwind, and obstacles, the pilot elected to use a down-sloping, non-grooved runway with a 41:1 approach slope and a displaced threshold, with an available landing length of 2,377 feet. The pilot executed a go-around after touchdown on his first landing attempt, stating that something did not feel right with the landing. The pilot then attempted another landing, touching down approximately 700 feet down the runway before applying reverse thrust and brakes. Because the runway was wet, the braking action was poor and he realized that he was probably going to overrun the end of the runway. However, he elected not to go around due to the airplane's low indicated airspeed, the configuration of the airplane, the remaining runway, the rising terrain, and the presence of houses. The airplane then rolled off the pavement on to grass, where the braking effectiveness was further reduced, before rolling down a steep embankment and into a river. The airplane sustained substantial damage to its wing structure during the accident sequence. Postaccident examination of the airplane revealed no preimpact mechanical malfunctions or abnormalities.

Review of the DOI's National Business Center, Aviation Management Directorate's Operational Policy Memorandums (OPMs) did not reveal any guidance that pertained to test flights. Additionally, the "Aviation Management – Document Library Index"—which included the OPMs, information bulletins, handbooks, and reference guides—included no single operations manual containing all of the information for ready reference by the DOI's pilots, nor was a mandate discovered which would require them to have such information in their possession during flight operations.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to land with a tailwind on a short, wet runway, resulting in landing long and runway overrun. Contributing to the accident was the operator's lack of standard operating procedures for test flights.

Findings

Personnel issues	Decision making/judgment - Pilot (Cause)
Environmental issues	Tailwind - Effect on equipment Wet surface - Effect on equipment Tailwind - Decision related to condition (Cause) Wet surface - Decision related to condition (Cause)
Organizational issues	Availability of policy/proc - Operator (Factor)

Factual Information

HISTORY OF FLIGHT

On September 25, 2008, about 1715 eastern daylight time, a Beech A200, N30W, sustained substantial damage during a runway overrun while landing at Bridgewater Air Park (VBW), Bridgewater, Virginia. The certificated airline transport pilot and his one passenger were uninjured. Day visual meteorological conditions prevailed for the local maintenance flight. No flight plan was filed for the flight conducted under Title 14 Code of Federal Regulations (CFR) Part 91.

According to the pilot who was an employee of the United States Department of Interior (DOI), Bureau of Land Management, he and a mechanic needed to do a "quick" maintenance test flight to check the pressurization system before departing for California the following day. The pilot advised that he had "followed" the maintenance done to the airplane during the day while attending to other business associated with an upgrade to the avionics system.

The pilot asked to have the two right main tires changed and monitored that maintenance activity as well. At approximately 1700, the pilot had the airplane's main fuel tanks filled completely. He then did his "normal checks and walk around," and taxied the airplane to the end of runway 33 for a "quick around the pattern" flight.

He found it difficult to hold the airplane stationary with the brakes during a "run-up" to check the pressurization. He stated that this was "common" after servicing the tires as a small amount of grease can get on the discs and pads. Because of this, his normal procedure was to taxi down to the other end of the runway with light brake pressure applied to remove any debris. He stated that he always did this and always departed runway 15 for a "better departure," in case of a "failure on takeoff."

On the day of the accident though, he elected to use runway 33 despite the presence of a "slight tailwind", and did not take his usual action to ensure good braking. He departed runway 33, and did "a few checks" on the "pressurization and flow packs," verifying functionality. The pilot then "set up" for a landing on runway 33 and upon touchdown, decided to "add power and go-around," as "something" did not "feel right," yet he failed to climb out and "take a minute" to evaluate the situation.

The pilot then "came around" for a second landing and "landed long" touching down approximately 700 feet down the runway, set his "normal amount of beta (reverse)" and started to apply brakes. He then realized that there was the possibility that he was going to "overshoot" because of poor braking action on the wet runway.

The pilot found that it was very easy to skid the left brake, and that the right brake braking action was "poor," until further down the runway. He "fought" the "strong urge" to abort the landing and "go-around," due to the airplanes low indicated airspeed, the configuration of the airplane, the runway remaining, the rising terrain, and houses.

The pilot tried to turn to the left without "side loading" the landing gear and thought he had the airplane stopped, until the airplane rolled off the runway pavement and on to the grass which was wet and he had "no braking at all." The airplane then rolled down a steep embankment and entered the river at a 45-degree angle to the riverbank. The right wingtip hit first and then both propellers struck the edge of the riverbank and stopped "immediately."

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) and pilot records, the pilot's lower right leg had been surgically amputated in 1987. He was administered a combination Pilot Certification Test and Special Medical Flight Test in a Cessna 310 on February 6, 1990 and was issued a Statement of Demonstrated Ability. He did not fly with a prosthetic device.

He held an airline transport pilot certificate, with multiple ratings including airplane multi-engine land. He reported a total flight time of 12,000 hours, with 8,500 hours in multi-engine airplanes, and 5,500 hours in the accident airplane make and model. His most recent FAA second-class medical certificate was issued on January 31, 2008.

AIRCRAFT INFORMATION

The airplane was manufactured in 1977. The airplane's most recent approved inspection program inspection was completed on August 7, 2008. At the time of the accident, the airplane had accrued 16,447.7 total hours of operation.

The airplane was leased to the DOI on October 30, 2003 by Dynamic Aviation Group Incorporated, and had been operated by the DOI since the signing of the long term use contract by the DOI's contracting officer.

According to Dynamic Aviation, prior to the test flight, two right main tires had been replaced, the pressurization controller tubing to the outflow valve had been replaced, the drain valve for the pressurization controller line had been replaced, the outflow and safety valve tubing had been replaced, and a clamp on the left wing heat exchanger had been tightened. Review of the maintenance records by FAA inspectors did not reveal however, how the airplane return to service was accomplished, as no documentation of the work done prior to the accident flight had been entered into the airplane records.

METEOROLOGICAL INFORMATION

The reported weather at Shenandoah Regional Airport (SHD), Staunton, Virginia, located 7 nautical miles southeast of the accident site at 1700, included: wind 070 degrees at 5 knots, visibility 10 miles, drizzle, fog, overcast at 2,300 feet, temperature 14 degrees Celsius, dew point 12 degrees Celsius, and an altimeter setting of 30.23 inches of mercury.

AIRPORT INFORMATION

According to the Airport Facility Directory, VBW was a non-towered, public use airport. Runway 33 was 2,745 feet long by 60 feet wide. It was asphalt, in good condition, but was not grooved. Skid marks which matched the landing gear geometry of the accident airplane began approximately 2,059 feet northwest of the displaced threshold, and continued until they left the paved portion of the runway, where ground scars were present which continued to the river bank.

Obstructions existed on the approach end of runway 33. These included a 35 foot pole, which displaced the threshold by 368 feet. The pole was located 1,277 feet from the approach end of the runway pavement, and 184 feet right of the centerline. A 30:1 slope was required to clear the pole.

A 41:1 approach slope to the displaced threshold was published for the runway, and the

available landing length was 2,377 feet. The runway sloped downward 0.3%.

WRECKAGE AND IMPACT INFORMATION

Postaccident examination by an FAA inspector revealed that the airplane's wing structure was substantially damaged. No preimpact mechanical malfunctions or abnormalities of the braking system, flight controls, propeller controls, or engines were discovered.

TESTS AND RESEARCH

During a post accident interview with the pilot, The FAA asked if the airplane was in Public Use and the pilot stated "that it had to be".

Operational Control

After the FAA advised the NTSB that the airplane was public use at the time of the accident, the Investigator-in-Charge (IIC) contacted the DOI's National Business Center, Aviation Management Directorate's Aviation Safety Manager and was advised that the airplane was not in public use, and that the airplane was on a maintenance test flight to check and see if the pressurization system was functioning properly.

Review of the contract between the DOI and Dynamic Aviation by NTSB investigators revealed however, that a functional maintenance test flight was to be performed at the contractor's expense, and that, "This shall be accomplished before the airplane resumes service under the contract."

When asked by the IIC how a DOI pilot had ended up operating the flight, the IIC was advised by the Aviation Safety Manager that the DOI's Bureaus would sometimes lend pilots out to get aircraft back in service. When asked how this was accomplished, the Aviation Safety Manager advised that there were procedures that were followed and that they tried to operate like a "FAR 135" (Title 14 CFR Part 135) operation. When asked where pilot guidance regarding how a test flight should be conducted, was published, and where operational information was published for the DOI's pilots, the IIC was advised that the information was contained on the DOI's National Business Center, Aviation Management Directorate website, in a series of Operational Policy Memorandums (OPMs).

A review of the OPMs however, did not reveal any guidance information that pertained to test flights. Additionally, it was discovered that despite the hundreds of documents that were listed in the "Aviation Management – Document Library Index" which included the OPMs, information bulletins, handbooks, and reference guides, no single operations manual was discovered that contained all of the information for ready reference by the DOI's pilots, nor was a mandate discovered which would require them to have it in their possession during flight operations.

National Business Center Aviation Management Directorate

Between 1968 and 1973, the DOI experienced 148 aircraft accidents, 29 fatalities and 48 serious injuries which resulted in the death of 29 employees and serious injury to 48 others. As a result, The United States Department of Interior's National Business Center Aviation Management Directorate (NBC-AMD), formerly the Office of Aircraft Services (OAS)) was established by the Secretary of the Interior on July 1, 1973 to "Raise the safety standards, increase the efficiency, and promote the economical operation of aircraft activities in the

Department of the Interior." In this capacity, NBC-AMD serves both the Secretary and the eight DOI bureaus as primary customers NBC-AMD also serves the aviation needs of numerous other Federal agencies. NBC-AMD's mission is: "To provide our customers with higher quality (Better), more cost-wise (Cheaper) aviation services at lower cycle times (Faster) that result in increased operational performance and fewer losses (Safer) than any one of them can provide for themselves".

According to NBC-AMD, they are responsible for Department-wide functions related to aircraft services and facilities, and aviation safety is a primary consideration for all actions.

NBC-AMD functions and responsibilities include among others:

- Development and implementation of Department-wide aviation safety and aircraft accident prevention programs.

- Maintain Bureau aviation program oversight to provide quality assurance, measure efficiency and effectiveness, and to assure that standards are in place which enhance personnel safety.

- Establishment and management of Department-wide aircraft accident/incident and aviation hazard reporting systems.

- Ownership and management of Department of the Interior (DOI) fleet aircraft. Assigning DOI fleet aircraft and/or NBC-AMD personnel to bureaus as requested to support bureau programs.

- Procuring DOI-owned aircraft, commercial aviation services, and other aviation-related services in support of bureau programs.

- Assisting bureaus in determining whether aircraft should be Government owned, leased, contracted, or chartered.

- Coordinating aircraft use in such a manner as to obtain the best utilization of existing equipment, consistent with Department-wide mission requirements.

- Establishing and maintaining standards governing operational procedures, aircraft maintenance, aircrew qualifications and proficiency, and maintenance personnel qualifications.

- Developing and implementing an aviation user-training program to meet Department-wide and specific bureau needs.

- Inspecting and monitoring aircraft operations to assure those standards are being met.

- Prescribing the procedures for justification, budgeting and management of the financial aspects of aircraft owned and/or operated by the Department.

- Furnishing technical assistance for specialized aviation problems.

ADDITIONAL INFORMATION

On September 30, 2008, NBC-AMD advised the Safety Board that at the time of the accident, DOI aviation services contracts did not provide for government personnel to participate in any off-contract operations, and DOI aviation policy also did not have provisions for government personnel to participate in any off-contract operations.

Corrective Actions

In order to increase safety NBC-AMD took the following corrective actions:

1. Clarified and re-emphasized to all DOI aviation personnel (pilots, aviation managers, contracting officers, contracting officers representatives, etc.), current DOI contract(s) language and DOI aviation policy regarding the participation of government personnel in off-contract operations.

2. Developed a DOI process to address (review, and make appropriate risk management decisions regarding) any identified requirements to have government personnel participate in off-contract operations.

3. Educated DOI personnel on contractual and departmental policy requirements/processes regarding government personnel participation in off-contract operations.

4. Published a Department of Interior Lessons Learned Bulletin (No. DOI-09-01) addressing, runway selection, go around decisions, aircraft systems capabilities, and aircraft limitations. This bulletin was distributed to all aviation users in the DOI's eight bureaus.

5. Revised the contractual language to allow (some) DOI pilots to participate in (limited) maintenance flights when it's beneficial to the government to eliminate "off contract operations". As a result, if the event/aircraft is not covered in the contract, then the operation is not authorized.

6. Began work with all of the bureau representatives to require fleet pilots to carry an Aviation Policy Handbook on board their aircraft.

History of Flight

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

Pilot Information

Certificate:	Airline Transport; Flight Instructor	**Age:**	55, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 With Waivers/Limitations	**Last Medical Exam:**	01/31/2008
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	01/30/2008
Flight Time:	12000 hours (Total, all aircraft), 5500 hours (Total, this make and model), 11500 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 42 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BEECH	**Registration:**	N30W
Model/Series:	A200	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	BC-72
Landing Gear Type:	Retractable - Tricycle	**Seats:**	5
Date/Type of Last Inspection:	08/07/2008, 100 Hour	**Certified Max Gross Wt.:**	12500 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Prop
Airframe Total Time:	16448 Hours	**Engine Manufacturer:**	Pratt & Whitney Canada
ELT:	Installed, not activated	**Engine Model/Series:**	PT-6
Registered Owner:	Dynamic Aviation Group Inc.	**Rated Power:**	850 hp
Operator:	Dynamic Aviation Group Inc.	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	SHD, 1201 ft msl	**Observation Time:**	1700 EDT
Distance from Accident Site:	7 Nautical Miles	**Direction from Accident Site:**	135°
Lowest Cloud Condition:		**Temperature/Dew Point:**	14°C / 12°C
Lowest Ceiling:	Overcast / 2300 ft agl	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	5 knots	**Visibility (RVR):**	
Altimeter Setting:	30.23 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	Light - Showers - Drizzle		
Departure Point:	Bridgewater, VA (VBW)	**Type of Flight Plan Filed:**	None
Destination:	Bridgewater, VA (VBW)	**Type of Clearance:**	None
Departure Time:	1700 EDT	**Type of Airspace:**	

Airport Information

Airport:	Bridgewater Air Park (VBW)	**Runway Surface Type:**	Asphalt
Airport Elevation:	1165 ft	**Runway Surface Condition:**	Wet
Runway Used:	33	**IFR Approach:**	None
Runway Length/Width:	2745 ft / 60 ft	**VFR Approach/Landing:**	Full Stop; Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	38.366667, -78.960278 (est)

Administrative Information

Investigator In Charge (IIC):	Todd G Gunther	**Adopted Date:**	03/16/2011
Additional Participating Persons:	Ramon Smeltz; FAA/FSDO; Dulles, VA Keith C Raley; DOI/AMD; Boise, ID		
Publish Date:	03/16/2011		
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.ntsb.gov/pubdms/.		

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