



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation  
Safety Alaska Region

May 24, 2019

# **AIRFRAME AND ENGINE EXAMINATION SUMMARY**

### **A. ACCIDENT**

<b>NTSB Number:</b>	<b>ANC19FA019</b>
<b>Location:</b>	Metlakatla, Alaska
<b>Date:</b>	May 20, 2019
<b>Aircraft:</b>	N67667 de Havilland DHC-2
<b>Investigator-in-Charge (IIC):</b>	Noreen Price
<b>Parties to the Investigation:</b>	Jon Percy, FAA Aviation Safety Inspector IIC Michael O'Brien, Taquan Party Coordinator

### **B. DETAILS OF THE INVESTIGATION**

#### **1.0 Background (Preliminary Information)**

On May 20, 2019, about 1556 Alaska daylight time, a float-equipped De Havilland DHC-2 (Beaver) airplane, N67667, flipped inverted during a landing in Metlakatla Harbor, Metlakatla, Alaska. The commercial pilot and passenger sustained fatal injuries. The airplane sustained substantial damage. The airplane was registered to Blue Aircraft, LLC and operated by Venture Travel, LLC, dba Taquan Air, Ketchikan, Alaska, under the provisions of Title 14 *Code of Federal Regulations* Part 135 as a scheduled commuter flight. Company flight following procedures were in effect and visual meteorological conditions prevailed. The flight originated from the Ketchikan Harbor Seaplane Base (5KE), Ketchikan, Alaska, about 1540 as Flight 20, and was destined for the Metlakatla Seaplane Base (MTM) in Metlakatla.

According to company dispatch documents, Flight 20 was a scheduled flight with one passenger, mail, freight and UPS packages destined for Metlakatla, which is about 16 miles south southeast of Ketchikan. Preliminary air traffic control data indicated a track to the southeast, south and then to the southeast for a right turning track into the harbor in a westward direction. Refer to figure 1.

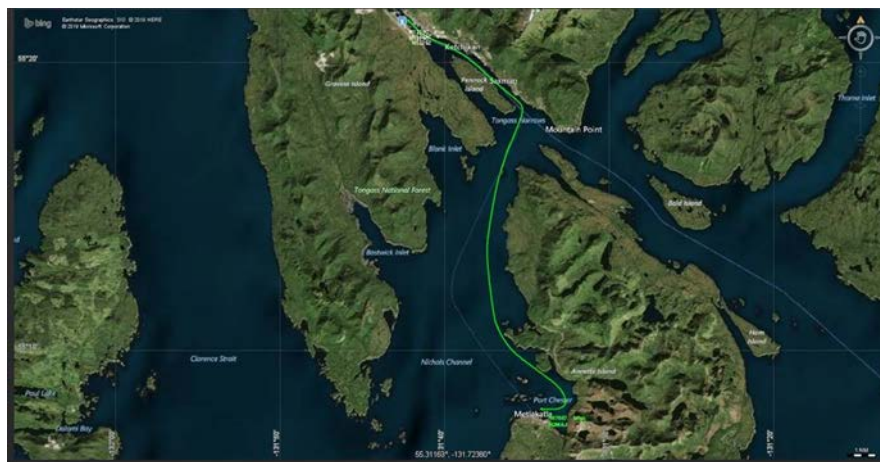


Figure 1. Preliminary air traffic control track

Three eyewitnesses reported that the airplane made a westward approach in the southern section of the harbor. Two witnesses observed the airplane's left wing dip down, and then right wing dip and strike the water. One of the witnesses stated that the right float dug down into the water and the airplane flipped over. After touchdown the right wing impacted the water and the floats dug down and the airplane flipped over rapidly. Witnesses stated that the right wing separated during the impact sequence. Nearby boats and shore personnel were able to respond quickly; however, they were not able to rescue the occupants due to debris in the cabin and the depth of the airplane. A nearby fishing boat was able to lift the airplane tail out of the water with lines tied around the empennage. Refer to figure 2. The occupants were removed from the wreckage and transported to the Annette Island Medical Clinic where they were pronounced deceased. The wreckage was towed to shore and secured by good Samaritans and the Metlakatla police. Various boats at the scene collected mail, UPS packages, debris and airplane seats. According to first responder's testimony, the seats were removed at the scene to facilitate access to the occupants. The front right seat was observed sinking by a witness after removal.



*Figure 2. Rescue boat pulling airplane out of water with ropes around empennage*

On May 21, the NTSB and FAA IICs and recovery crew flew to Metlakatla and examined the wreckage. All of the airplane's primary components were present and attached with the exception of the right wing, most of the seats and the engine cowling. The right flap was still connected to the inboard mount. The wreckage was transported via barge to a Temsco hangar in Ketchikan.

On May 22, the NTSB IIC, FAA IIC and Taquan Air party representative conducted detailed airframe and engine exams. The two Chelton cockpit displays were removed from the instrument panel and shipped to the NTSB recorder laboratory.

## **2.0 Accident Site**

GPS Coordinates: N55 08.13, W131 34.22, provided by Metlakatla Police Chief  
Elevation: 0 ft msl

The NTSB participated in a flyover of the accident site after the airplane was moved to the beach. The harbor consists of rocky islands in the center with tidal rocks marked with green markers. The area is large with numerous approach options. Mountainous terrain was present to the east of the harbor. According to the police chief, the wreckage was turned upright and floated to a high beach to the west of the accident scene. Refer to figure 3.



Figure 3. Metlakatla Harbor and N67667 on the beach.

### 3.0 Airframe Examination

N67667

Airframe SN: 1309

TTAF: 29, 575 at last annual inspection, 4/16/19



Figure 4. N67667 in examination hangar

The airplane and floats were intact. The right wing and strut had separated from the fuselage at the attachment points and fractured lower strut bracket. The metal around the fractured mounts was deformed in a rearward direction, consistent with separation upon impact. The right flap was attached to the inboard bracket with fractured control rod attached. The right fuselage had impact indentations consistent with the outline of the inboard flap edge in the land flap configuration. The engine cowling was also missing. The top of the forward fuselage above the cockpit was fractured at the upper center windshield brace and the forward upper skin was deformed inward/downward into the cockpit. About 80% of the windshield glass was fractured and missing.

The right forward door was secure in place with mild deformation and the door opening mechanism worked properly. The right cabin door was open and attached partially by the forward lower attachment. Both right windows were intact. The left forward door (pilot's) was secure in place with minor deformation. The opening mechanism worked properly, and the top of the left door window frame was deformed outward. The left cabin door was secure in place. The left cabin window behind the door was broken. (1<sup>st</sup> responder reported breaking a window.) The aft window was intact. All exit placards were in place and clearly visible.



The left front (pilot) seat was secure to the floor and exhibited fractured attachment at left lower tube and some downward deformation. Refer to figure 5. The restraint system was a traditional three point design with inertial reel shoulder harnesses. The pilot's lap belt ends were secure to the seat and the shoulder harness was connected to the left lap belt clasp. The pilot's upper harness strap was secure in the inertial reel and full functionality was demonstrated. Neither the right front seat (passenger's) nor the lap belt were present, and the upper right harness strap was secure in the inertial reel with a cut evident about 2 feet from the upper end. (reported cut by 1<sup>st</sup> responder) All webbing was in excellent condition. The four corners of the cargo net were secure to attachment points behind the cockpit, with cuts about 5 inches from each corner. (Cut by 1<sup>st</sup> responders.) The netting was recovered in one piece. One of the two second row seats was present and secure to the floor. The remaining seats were recovered by boats at the scene. The ELT was secure behind the aft cabin bulkhead attached to the antennae in off position.



*Figure 5. Pilot seat and cockpit view from right front door*

The fuselage left side fuel panel was closed and secure. Each of the three fuel tank caps were on and secure. The forward tank was full and contained clear, blue avgas. (35 gal capacity)

The cockpit structure was sound, with the exception of the overhead structure which was deformed downward into the cockpit. The instruments, indicators and switches were as follows:

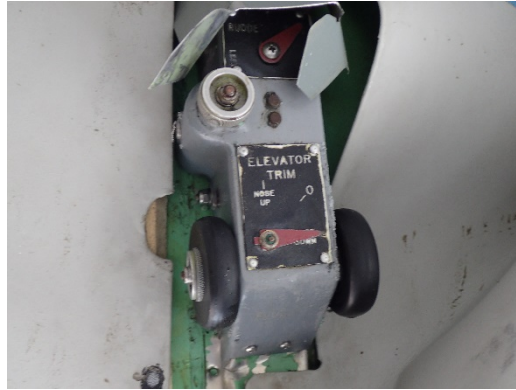
EFIS -	On
TAWS -	Inhibit
AHRH BAT -	ON, CBs in
Hobbs -	ON, 929.7 hrs
Altimeter -	20 ft, 29.73
Airspeed -	108 mph
Attitude Ind-	nose down, left wing down 10°
Fuel Selector-	Center
Magnetos-	Both, Starter switch covered
Master-	On
Lights-	pulse, cabin, landing light, nav lights - off, beacon -on
Pitot Heat-	Off
Radio Master-	On
Carb Heat-	Off
Fuel Shut Off-	Down and safety wired
Wobble Pump-	Connected, down

Cabin Heat- On  
 Emerg Carb Air- In, safety wired  
 Sea Rudder lever- Down, cable attached  
 Suction- 10  
 Oil Tank- Cap secure, 3.5 gallons  
 Circuit Breakers- All in  
 Manifold Pressure- 30 in  
 RPM Tachometer- 0 rpm, 2287.7 hrs  
 CHT- 0  
 Oil gages- off, 0  
 Fuel Quantity off, 0  
 Mag Compass- 210°  
 Voltmeter- 7  
 Rudder Trim- Right  
 Elevator Trim- Nose down  
 Carbon Monoxide Detector- yellow  
 Chelton PFD and MFD - secure, off, removed by NTSB  
 Mixture- Full Rich  
 Propeller- Middle  
 Throttle- 1/3 open, lever bent to the left  
 Transponder- On  
 Flap Selector- Down  
 Flap pump handle - up, attached, secure  
 Flap indicator- Land Flaps (slightly right of)

The empennage exhibited buckling and pinched skin throughout the aft section. The aft 4 inches of the dorsal fin skin was torn downward, likely a result of ropes pulling the airplane out of the water. The vertical stabilizer was attached and intact with some deformation at the top edge. The rudder and rudder trim were attached, yet deformed in various directions, likely due to mechanical damage during haul out. The horizontal stabilizers were attached and intact. The right horizontal exhibited one compression dent on the leading edge at the mid span.

The left wing was intact with the wing root fairing loose. The aileron was attached and demonstrated full controllability. The left flap was attached, secure and indicated the land flap position. The flap trailing edge exhibited 20 inches of aft-to-fore compression at the mid span, with split skins along the damaged area. The lift strut was secure at attachment points. The right wing was observed floating about 50 ft from the wreckage immediately after the accident. Photographs indicate that the lift strut was attached. It is presumed to have sunk in the harbor and has not been recovered.

Flight control continuity was established from the pilot's control wheel to the left aileron and right wing aileron pulley, as well as the elevator. Control continuity was also established from the pilot's rudder pedals to the rudder. All control surfaces that were present exhibited full functionality. The rudder and elevator trim wheel rotated with corresponding trim cable movement; however, the cable did not extend or retract. Trim cable continuity was established to the aft trim tabs; however, movement could not be established due to airframe deformation and cable constriction forward of the cockpit upper trim wheels. Refer to figure 6.



*Figure 6. Elevator and rudder trim indicators*

The left and right floats (Edo model 679-4930) were secure in place and intact. The support struts were all secure as well. All pulleys were secure with cable loosely wrapped, except for the right rear belly pulley which had a fractured bracket. The right and left rudders were each fractured at the lower welds and each exhibited mild bending in the rudder. Control continuity was established from the cockpit rudder lever and rudders to the sea rudders. Refer to figure 7.



*Figure 7. Left Sea Rudder and floats*

The cabin contents were collected from nearby boats in the harbor. The company flight can was recovered. Company documents indicated seat configuration A was being used. The most recent mechanical gripe was written on May 15 indicating the engine throttle stuck above idle during ramping. The gripe could not be duplicated.

Waterlogged mail bags, packages, a backpack and two luggage bags were recovered. For weight and balance calculations, the company manifest will be used. Preliminary calculations indicate the airplane was within weight and balance limits. Company dispatch personnel stated that the airplane departed with two hours of fuel on board (60 gal).

## 4.0 Engine Examination

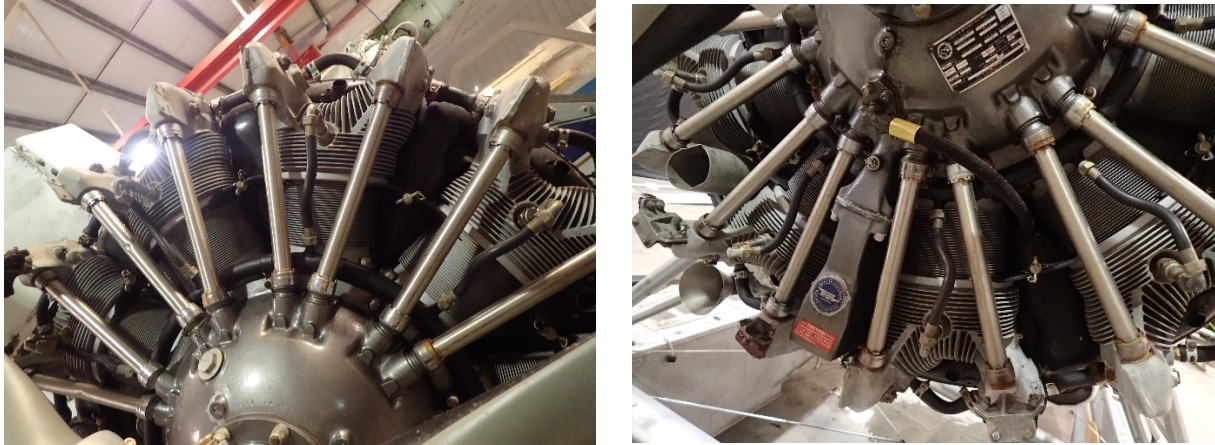
Pratt and Whitney R-985- AN-14B

SN: 42-122581

SMOH: (at last inspection) 671 hrs

TT Engine: (at last inspection) 6023 hrs

Last inspection: 100 hour, 4/16/19



*Figure 8. Pratt and Whitney R-985 engine front top and bottom*

The engine and engine mounts were all intact with all fuel, oil, ignition and electric lines connected and secure. All spark plugs and cylinders were secure intact. There were no visible leaks present. The induction and exhaust systems were attached and undamaged. The magnetos were secure at the accessory mounts. The propeller rotated easily when turned by hand. Seawater was expelled from the exhaust system as each piston moved with propeller rotation. Refer to figure 8.

The engine throttle was connected securely to the throttle valve which moved from stop to stop when the control level was moved. The mixture and propeller cables were connected to their prospective control rods and exhibited full movement. Refer to figure 9.



*Figure 9. Engine controls*



The propeller (HC-B3R30-4B) was secure to the engine and each blade was secure to the hub. The pitch of each blade was uniform at a moderate flat pitch. A blade labeled “A” was slightly curled aft through the whole span, with some scrapes and sand on the aft side, indicative of recovery damage as it was dragged to the beach. The other two blades were straight with no damage indicated.



*Figure 10. Hartzell propeller and blade “A” with mild bend*

## 5.0 Summary

There were no pre-impact anomalies discovered during the airframe and engine exam that would have resulted in a loss of control during landing. Full flight control continuity was confirmed for all controls that were present. The engine exhibited crank shaft and valve continuity, as well as cockpit control continuity. The separation signatures of the right wing corresponded to separation in a forward direction at impact as stated by witnesses. The downward deformation of the top of the cockpit is indicative of hydraulic force during a high speed inversion into the sea. The restraint harness systems that were present were functional and the forward egress doors were operable.