

FY04 Forest Service Aviation Accident Review

In Memory of:

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Introduction

Information Sharing

- NTSB regulation 831.13 Flow and dissemination of accident or incident information generally states that “Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action. However, no information concerning the accident or incident may be released to any person not a party representative to the investigation (including non-party representative employees of the party organization) before initial release by the Safety Board without prior consultation and approval of the IIC.

Introduction

The NTSB has not finalized all or determined probable cause for all of the accidents at this time.

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed

For accident prevention purposes only

NTSB Identification: **SEA04LA029.**

Accident occurred Monday, December 22, 2003 in Missoula, MT

Aircraft: Beech 58P, registration: N181AM

Injuries: 1 Minor, 1 Uninjured.

Operational Control Region 6 Regional Air Group



Mission

The aircraft departed Redmond, OR transporting two passengers to Missoula, MT. After dropping off the passengers in Missoula, the mission was then changed to pilot training for the return flight from Missoula to Redmond.

Shortly after take off during night instrument meteorological conditions the flying pilot reported that he made a right turn from runway heading at about 400 to 500 feet above ground level to intercept the outbound radial from the VOR to accomplish the departure procedure.



The second pilot, who had no previous flight time in this make and model aircraft and was the flying pilot.



Direction of Landing

During the turn, a "thump" was felt and the right bank angle increased from about 25 degrees to 45 degrees. While the second pilot was attempting to correct from the increased bank angle, the aircraft at some point, entered a descent.



Mishap Site 12/23/2003

Just before ground impact to open terrain about one mile south of the runway, the pilot-in-command took control of the aircraft to level the wings.



Empennage, looking in direction of landing

The aircraft skipped across the open terrain for several hundred yards before coming to rest on its belly. The aircraft was consumed by fire shortly thereafter.



Fire Damage

Neither pilot could explain the loss of altitude as both believed they were in a continuous climb during the event as airspeed and pitch attitude remained constant.



Condition of Engines and Props

Neither pilot could recall if they scanned the vertical speed indicator or altimeter to verify if they were indicating a climb or descent.



Trim Settings

During the post accident inspection of the aircraft, no evidence of a mechanical failure or malfunction was found and no evidence of an in flight collision with an object was noted. At the time of the accident, low freezing fog and visibility was reported.



Obstacles

NTSB Probable Cause

The second pilot's failure to maintain terrain clearance while maneuvering after takeoff. Proper climb rate not verified by the flight crew, fog, freezing fog, dark night conditions and inadequate supervision by the pilot-in-command were factors.

Accident Review Board (ARB) Action Items

- Perform a review of R6 standards and practices for pilot training to ensure adequacy, compliance with national standards (where applicable), and implementation. Correct identified deficiencies.
- Request an outside resource (i.e. GSA-ICAP) to evaluate the R6 aviation management and flight operations program.

ARB Action Items

- Re-emphasize the importance of aviation site reviews nationally. Develop an aviation site review schedule for all regions and provide this information to the Directors of FAM and RAO's.
- Rewrite national policy in the FSH 5709.16 to require a formal risk assessment process and go-no-go decision-making prior to each fixed-wing flight.

ARB Action Items

- Standardize pilot training and proficiency through a centralized, national-level process and establish and maintain a database for record keeping.
- Rewrite policy in FSH 5709.16 to establish IFR takeoff minimums for visibility, ceiling, icing conditions, and safe return to the airport of departure in case of emergency.

Management Strengths

- Immediate notification was made to the National Aviation Safety Center.
- Both the flight crew and region were cooperative in the investigation.
- The region had an outside source conduct a review of the regions aviation management and operations. Identified deficiencies were corrected.

NTSB Identification: FTW04TA075.

Accident occurred Wednesday, February 18, 2004 in Decatur, TX

Aircraft: Bell 206B, registration: N16MV

Injuries: 1 Minor.

Operational Control: LBJ National Grasslands



Not

Mission

The helicopter was providing aerial ignition and external load (water bucket) supporting a prescribed burn. The helicopter utilized both a Plastic Sphere Dispenser and a 108-gallon Bambi Bucket.

During lift off from soft uneven terrain, the rear portion of the helicopter's right main skid came in contact with the ground resulting in a dynamic rollover. The pilot reported that the terrain he departed from was "clumpy and lumpy with ruts of grass approximately 1 to 2 feet in height."



As he started to lift the helicopter off the ground, he made a slow ascent rate. When the skids were about 1 foot above the ground, he said, "the helicopter stopped for a split second as if something had caught some portion of the right side of the helicopter and the helicopter began a slight lateral roll to the right."



The pilot further reported that he recognized the problem too late as he applied full left cyclic and lowered the collective after the helicopter exceeded the critical angle of bank into the low skid to a point where the situation was unrecoverable, and it rolled 90 degrees to the right.



No mechanical deficiencies with the engine or airframe were noted



The Rotorcraft Flying Handbook (FAA-H-8083-21), page 11-7, described dynamic rollover as, "the pivoting around a skid or landing gear wheel of a helicopter causing it to reach its critical rollover angle. Beyond this point, main rotor thrust continues the roll and recovery is impossible."



NTSB Probable Cause

The pilot's failure to maintain control of the helicopter during liftoff after encountering dynamic rollover. A contributing factor was the rough and uneven terrain.

ARB Recommendations

- The agency should establish minimum Training, evaluation and certification for entry-level helicopter pilots performing aviation natural resource missions including external load missions.
- The agency should re-assess the role of and need for a Marshaller/Parking Tender under the various missions. (This recommendation is currently being addressed by the agency, and is expected to be finalized in 2005)
- With a significant number of dynamic rollover events occurring on flatland terrain, we recommend the Agency review the data for dynamic rollover events, determine if there is a cause and effect situation, and recommend actions be taken as needed.

Management Strengths

- The unit was well prepared for the mission, with thorough plans in place and pre and post briefings being conducted on all helicopter operations.
- The aviation mishap response plan was updated and utilized. Emergency Medical Services were on the scene 12 minutes after the accident.
- A Safety Alert (2004-06) was issued re-assessing the role of and need for a Parking Tender. Changes are being made to the Interagency Helicopter Operations Guide.

NTSB Identification: SEA04TA147.

Accident occurred Monday, July 26, 2004 in Burns, OR

Aircraft: WSK PZL Mielec M-18A, registration: N495WP

Injuries: 1 Uninjured

Operational Control: R-6 Malheur NF



Mission

The aircraft was delivering retardant to the Tenant fire approximately 20 miles northwest of Burns, OR.

The pilot reported that he was attempting to climb following a retardant drop. When he moved the throttle forward, the engine did not respond. He said the airplane started losing altitude, and pumping the throttle had no effect.



The pilot saw a plateau just southwest of the fire, and he performed a forced landing to it. During the landing, the throttle would not retard all the way.



In order to land the airplane where he wanted to, he turned the fuel selector to the off position. During the landing roll, the left wing impacted a fence pole bending ribs and wrinkling the aileron.



Post accident examination revealed that the bolt normally connecting the throttle linkage clevis to the throttle arm was missing. The investigating team examined a sister aircraft from the same provider. They found that a nylon lock nut had been installed on the clevis bolt, and it was loose enough to be removed without the aid of any tools.



The industry standard, found in FAA Advisory Circular AC43.13-1B, chapter 7, section 4, paragraph 7-64 states that nylon locking nuts should not be used with rotating components or assemblies. It further states that nylon and/or fiber nuts are highly susceptible to wear from repetitive use and from high heat



Bent ribs and wrinkled aileron



NTSB Probable Cause

The improper installation of the throttle linkage clevis to the throttle control arm by unknown maintenance personnel. Contributing factors were the nylon lock nut separating from its' bolt, which permitted the throttle cable to disconnect from the throttle control arm, and the fence post.

ARB Action Items

- Re-inspect aircraft operated by vendor.
- Establish contractual requirements for maintenance of SEAT aircraft equivalent to other interagency fire aircraft.
- Conduct a risk analysis and develop mitigation measures for Forest Service use of SEAT's.
- Establish an interagency working group to conduct an operational analysis of SEAT's and develop use standards.
- Establish policy based on the risk and operational uses analyses.

Management Strengths

- The pilot used excellent judgment in emergency landing procedures getting the aircraft safely on the ground with no injuries.
- The unit was extremely cooperative with investigation team needs, especially the UAO who was extremely helpful aiding the investigation team with research and follow-up.
- Excellent interagency cooperation.

NTSB Identification: SEA04TA158

Accident occurred Wednesday, August 11, 2004 in
Leavenworth, WA

Aircraft: Bell 205A1, registration: N205XP

Injuries: 1 Fatal.

Operational Control: Okanogan & Wenatchee NF's



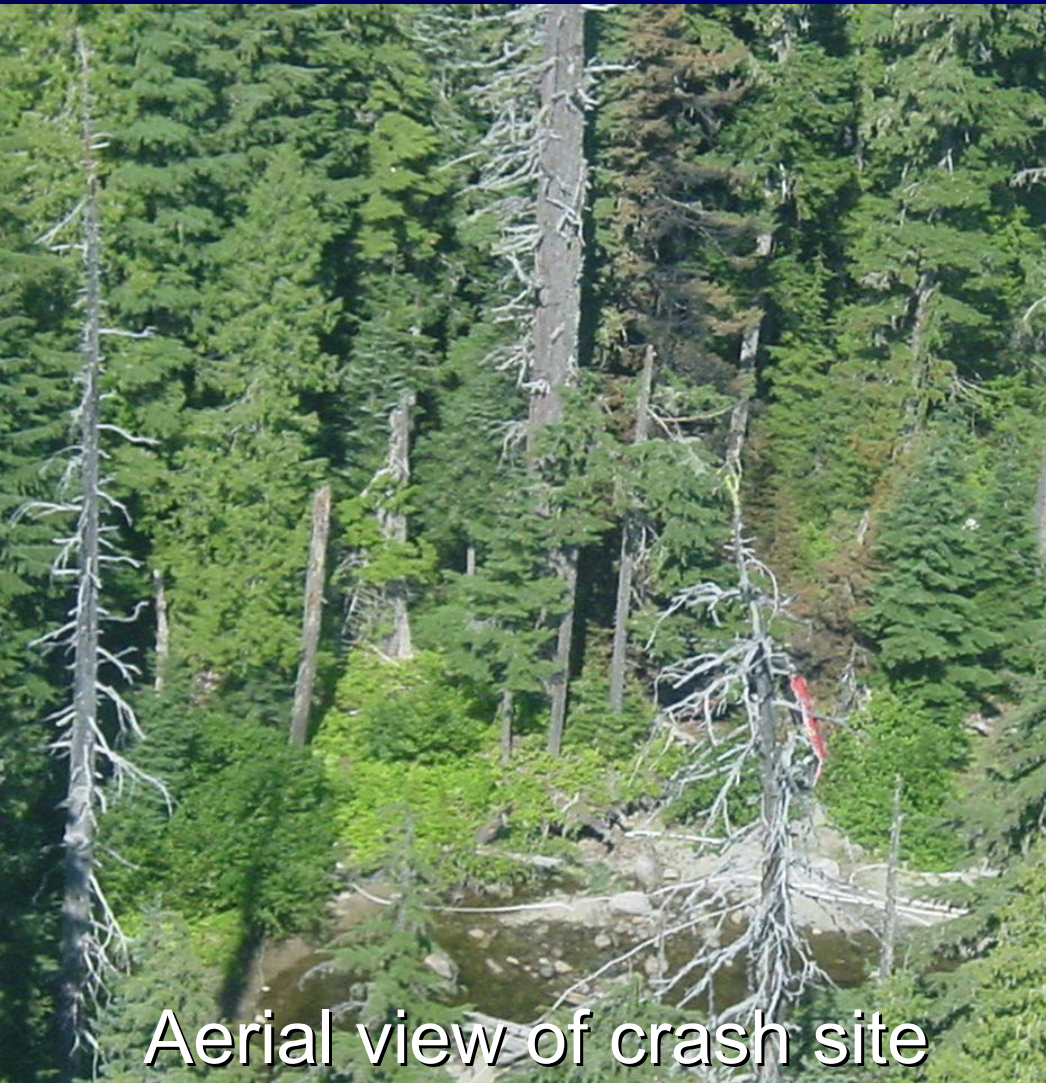
Mission

The aircraft was delivering supplies to smokejumpers in the Alpine Lakes Wilderness, approximately 20 miles northwest of Leavenworth, WA via a 150 foot longline

The helicopter was destroyed and the pilot was fatally injured when it impacted heavily wooded, mountainous terrain. Prior to the impact, the helicopter's tail rotor struck a tree and aircraft control was lost while maneuvering to deliver an external load.



The helicopter was carrying a dual sling load on a long line. The pilot put the first load down without incident. He set the second load down, but then lifted it again, moved a short distance, and set it down again.



Aerial view of crash site



Aerial view of drop zone

Both loads were then unhooked from the longline by a ground crewman. One load was re-hooked to the longline to go to another fire. The pilot was given the thumbs up that the load was re-hooked and the crewman was clear of the aircraft.



The helicopter then started to ascend, and at that time, the helicopter's tail rotor contacted a dead snag. When the tail rotor contacted the snag, the helicopter was about 100 feet above the ground.



Crash site looking east

The helicopter began to spin, the main rotor blades struck other trees, and the helicopter fell to the ground. A post-crash fire erupted, which consumed the fuselage of the helicopter.



Broken tail boom

ARB Action Items

- Revise the IHOG Longline Procedures and Forest Service Operations and Safety Procedures Guide for Helicopter Pilots to state: In areas of sloping terrain or with obstacles rising to one or more sides of the cargo pickup/delivery area, or dip site, pilot shall maintain rotor clearance from all obstacles equivalent to the IHOG Chart 8-1 landing area safety circle requirements. When specified clearance cannot be maintained, the mission shall be declined by the pilot until hazards are removed, additional line can be added or a better location can be identified.

ARB Action Items

- Implement nationally a longline training and certification process for firefighters assigned to direct operations at helicopter drop zones.
- Include the following in the regional and national longline training:
 - Tree height measurement
 - Hazard recognition
 - Positive air to ground communication requirements
- Re-evaluate the use of drop zone markers in light of the hazard of target fixation.

Management Strengths

- Smokejumpers at the accident site made immediate notification to dispatch and instantly began rescue procedures in an effort to save the pilot.
- The unit was extremely helpful and cooperative in assisting the investigation team.
- Immediate and proper notifications were made to unit, regional and national offices.

NTSB Identification: SEA04GA192

Accident occurred Monday, September 20, 2004 in Essex, MT

Aircraft: Cessna 206G, registration: N206SM

Injuries: 3 Fatal, 2 Serious

Operational Control: Flathead NF/RMRS



Mission

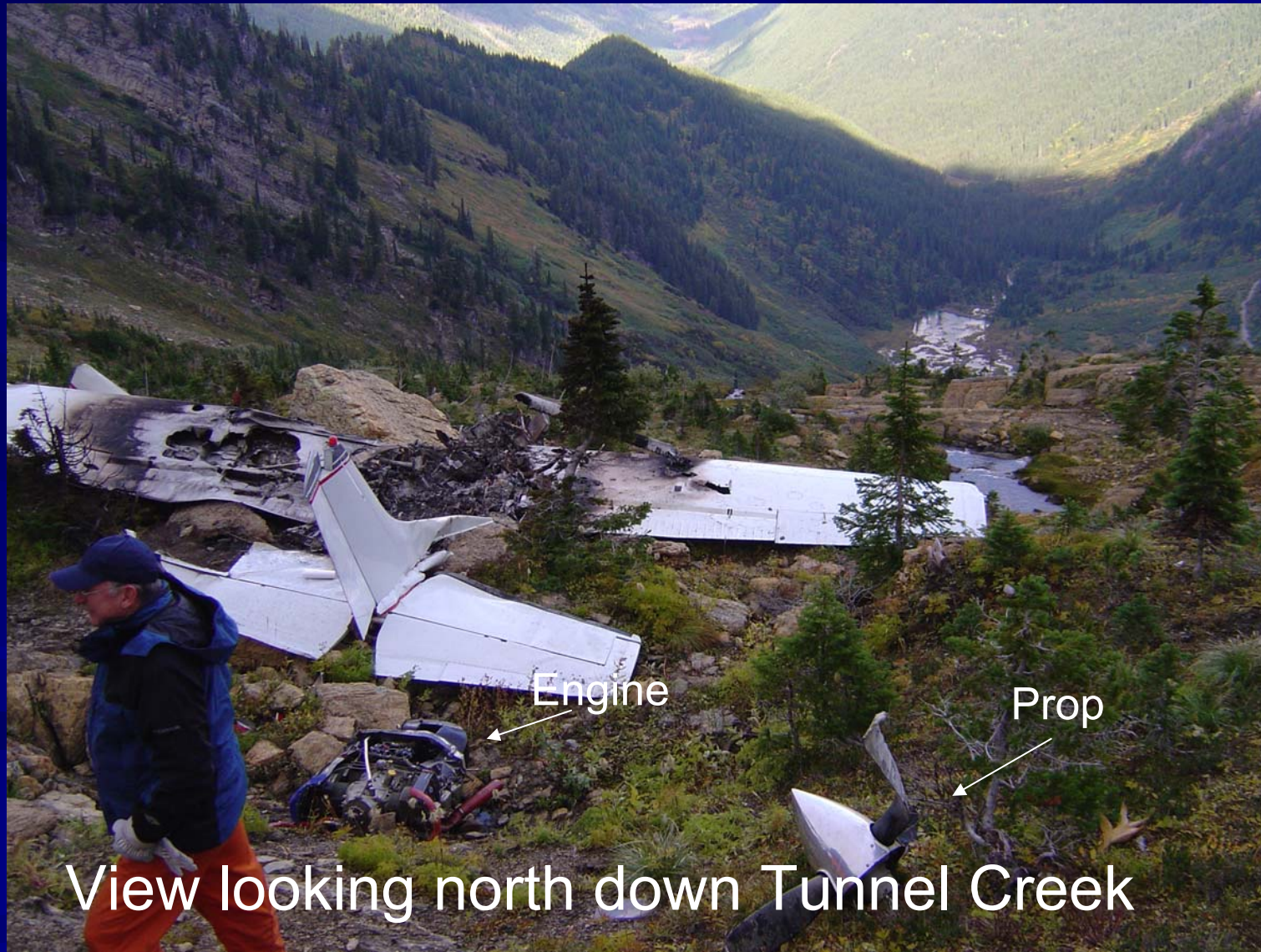
The aircraft departed Glacier Park International airport in Kalispell, MT transporting four USFS passengers to Shafer Meadows, MT, a USFS back country airstrip to perform a annual vegetation analysis and communications maintenance.

The aircraft departed Kalispell , MT on September 20, 2004, at approximately 1530 mountain daylight time the aircraft impacted mountainous terrain while maneuvering about 6 nautical miles northwest of Essex, Montana. The pilot and two USFS employees were killed, and the other two USFS employees sustained serious injuries.



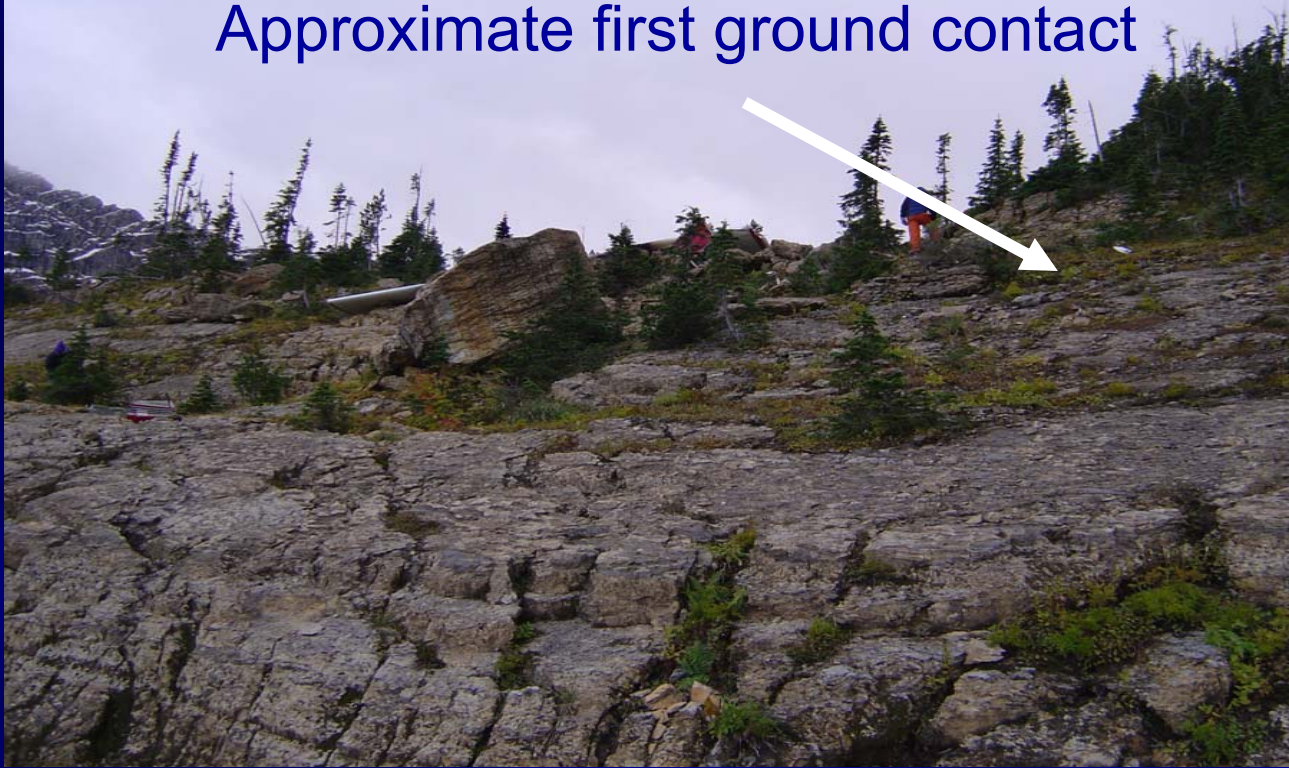
Aerial view of crash site

Visual meteorological conditions prevailed for the airplane's departure at 1500 from Glacier Park International Airport in Kalispell. An FAA flight plan was not filed; however, the airplane was receiving flight following services from the USFS.



View looking north down Tunnel Creek

Approximate first ground contact



The flight was originally scheduled to depart at 1300. The scheduled departure was delayed from 1300 to 1500 due to weather conditions. The planned route of flight was to follow Highway 2 from Glacier Airport to a point about 3 miles south of the town of Essex, where the highway and the Middle Fork of the Flathead River separate. At this point, the flight was to leave the highway and follow the Middle Fork drainage to Schafer.



Looking northwest at accident site

The last contact Glacier Tower had with the airplane was at 1508, when the pilot reported that he was through "the canyon" (Badrock Canyon approximately 8 miles northeast of Glacier Airport) and switching to "backcountry frequency" (USFS dispatch).

The right cargo door located on left side of wreckage



At 1515, the airplane checked in with USFS dispatch, and the pilot reported his position as "Essex, inbound for Schafer." This was the last radio communication. Examination of radar data confirmed that at 1508, the airplane was exiting Badrock Canyon heading northeast.

Looking southeast from first point of impact



Radar contact with the airplane was lost at this time due to mountainous terrain. From Badrock Canyon, the airplane's planned route proceeded along Highway 2, which follows a large bend in the Middle Fork of the Flathead, heading first northeast, then east, and finally southeast towards Essex. received from the airplane.

When the airplane did not check in with USFS dispatch as expected at 1530, a search was initiated. The wreckage of the airplane was spotted by ground searchers about 1345 on September 21, 2004. Search and rescue personnel reached the accident site via helicopter about 1510.



The Deputy Coroner for Flathead County inspected the scene and announced that all five occupants were fatally injured. The ground search was suspended. Approximately 1430 on September 22, 2004, two survivors walked out of the Tunnel Creek drainage.



Burned out engine compartment

ARB Action Items

- Review and modify as needed, current Forest Service requirements for backcountry pilot experience and approvals for appropriate requirements including a standard definition for “typical terrain.”
- Re-evaluate appropriate PPE requirements for fixed-wing backcountry flight operations.
- Place managerial emphasis on the full implementation of the Automated Flight Following program. Until this is fully implemented, latitude/longitude and heading reports should be required for check in on all GPS equipped aircraft.

Management Strengths

- Dispatch did an outstanding job of initiating search and rescue procedures when the aircraft missed the 15 minute check in.
- Dispatch made immediate and proper notifications including contacting the Montana Division of Aeronautics to assist in search and rescue efforts.
- Forest Service employees in the field immediately communicated to dispatch they had seen an airplane they believed was the missing aircraft flying up highway 2.

FY 2004

Incidents With Potential

Region 3

- 5/25/04 Bell 205 A1, Apache-Sitgreaves NF
Damage to hook well after bucket hit water while in forward motion
- 7/3/04 Bell 205, Tonto NF
Aircraft made uncommanded rotation while loading passengers

FY 2004

Incidents With Potential

Region 4

- 7/14/04 Lockheed P-3, Payette NF
Gear up landing
- 7/15/04 Sikorsky 64E, Toiyabe NF
Experienced loss of tail rotor effectiveness
- 8/8/04 Beech King Air 90, Regional Office
Maintenance, loose wing bolts

FY 2004

Incidents With Potential

Region 5

- 7/1/04 Aerocommander 500S, Klamath NF
Uncommanded prop feather
- 7/1/04 Sikorsky 58T, Shasta-Trinity NF
Rotor strike

FY 2004
Incidents With Potential
Region 6

- 7/18/04 Sikorsky CH54A, Okanogan & Wenatchee NF
Rotor Strike

FY 2004
Incidents With Potential
Region 10

- 7/11/04 Cessna 206 Amphibian
Gear up landing