Log 2444

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: May 4, 1994
In reply refer to: A-94-99 and -100

Honorable David R. Hinson
Administrator
Federal Aviation Administration
Washington, D.C. 20591

From July 4, 1991, to August 31, 1993, the National Transportation Safety Board investigated a total of 29 accidents involving either pilot guides (hunting/fishing guides who routinely transport clientele to/from game locations by aircraft) or "aero lodges," (lodges that are only accessible via aircraft operated by or for lodges in the State of Alaska). In all instances, the operations were being conducted under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91. Fourteen of the accidents resulted in fatalities or serious injuries. In contrast, during this same period, similar types of operations conducted under 14 CFR Part 135 experienced six accidents, one of which proved fatal. The total number of pilot guide/aero lodge flights conducted in Alaska during this period is unknown; therefore, the accident rate for this type of operation is not determinable. Nevertheless, because of the large number of these accidents and the causal factors involved, the Safety Board believes that these accidents reflect a serious safety problem in pilot guide/aero lodge operations conducted under 14 CFR Part 91 that warrants action by the Federal Aviation Administration (FAA) to enhance the level of passenger safety.

The following trilogy of pilot guide/aero lodge accidents provides a representative sample and illustrates the concerns of the Safety Board:

On July 30, 1992, a float-equipped de Havilland DHC2 airplane, operated by a lodge under a company visual flight rules (VFR) flight plan, collided with terrain near Dillingham, Alaska, while maneuvering to reverse direction in a mountain pass that was obscured by weather.[1] The six passengers sustained fatal injuries, and the commercial pilot was seriously injured. The airplane was destroyed by the impact and postcrash fire. The pilot said that during his attempt to reverse direction, the airplane stalled at an altitude of several hundred feet above the ground, and he was unable to regain control of the airplane before it crashed. The pilot

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[1] For more detailed information, read Field Accident Report ANC92FA116, Brief No. 0842 (attached).

reported that he had accrued several hundred hours in the DHC2 and that the majority of his flight time in the airplane was accrued with the lodge during the spring and summer months over a 2-year period. The Safety Board was not able to validate the pilot's type of flying experience in the DHC2. The lodge operator did not perform a background check on the pilot nor was a record kept of the pilot's flying activity. The pilot's proficiency in the DHC2, as well as his knowledge and understanding of the elements involved in mountain flying, were not assessed by the lodge on an annual basis.

On September 1, 1992, a wheel-equipped Cessna 206 airplane nosed over while making an emergency landing on a dry lake shore near Fort Yukon, Alaska, following an engine failure during cruise flight.[2] The private-certificated, self-employed pilot guide received minor injuries. One of the two passengers on board the airplane was seriously injured, and the airplane was substantially damaged. The passengers reported that the pilot aborted the first takeoff attempt after overrunning the gravel strip into 4-foot high willow brush. On the second takeoff attempt, the airplane went through the willows and "bumped over the river bank, down to the river, before getting airborne." The airplane reportedly climbed slowly with no reduction from takeoff power for approximately 55 minutes. There was a manufacturer-imposed maximum power time limitation of 5 minutes on the aircraft engine. Based on the passenger loading list, which comprised primarily moose meat and outdoor support equipment, and the pilot's account of fuel on board, the takeoff weight of the airplane was conservatively estimated to be 4,372 pounds, or 772 pounds over the maximum 3,600 pounds authorized by the manufacturer of the airplane.

On August 31, 1993, a wheel-equipped de Havilland DHC2 airplane crashed approximately 6 miles west of Iliamna, Alaska.[3] At the time of the accident, the airplane was being operated by a lodge under 14 CFR Part 91 on a VFR flight plan. The commercial pilot and two passengers were seriously injured, and three passengers were fatally injured. The airplane was destroyed. Accounts of the events leading up to the accident, as reported by the pilot, indicate that the airplane may have stalled while in a turn to reverse direction. The Safety Board's investigation into the pilot's background, qualifications, and training could not validate that the pilot received stall awareness and recovery training in the DHC2.

The Safety Board's review of the previously mentioned accident data revealed that the majority of the accidents resulted from inappropriate pilot decisionmaking. Consequently, attention was focused on the performance of the pilots, i.e., their level of pilot certification, experience, training; the typical flying environment; the extent of oversight provided by private/industry sources, as well as the FAA; and the adequacy of the applicable Federal Aviation Regulations (FARs).

The investigations disclosed that while most of the pilots possessed either a private or commercial pilot certificate, the indoctrination, training, and checkout they received in their

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[2] For more detailed information, read Field Accident Report ANC92LA152, Brief No. 0536 (attached).

[3] The investigation of Field Accident ANC93FA161 is continuing.

respective aircraft, as well as the nuances of Alaska flying, were self-taught and evaluated. The Safety Board believes that the environment in which these operations are conducted is often extremely demanding of both the pilot and aircraft, thus learning from only experience can be hazardous. The range of operation, for any given flight, may be from sea level to altitudes greater than 7,000 feet, with vast temperature, weather, and terrain extremes. Essentially, any area with a semi-level surface void of obstructions with sufficient length, as subjectively determined by the pilot, qualifies as a landing strip. Moreover, the majority of the flights are conducted in remote regions of Alaska where weather reporting is marginal or nonexistent. Consequently, the overall operation requires a high degree of knowledge, skill, professionalism, respect for the elements, and a keen awareness of the limitations of the aircraft and one's self.

Presently, entry into pilot guide/aero lodge operations under 14 CFR Part 91 is unrestricted. All that is required of a certificated private pilot is an aircraft and a willing client. Comments solicited from survivors and next of kin revealed a general belief that flights were quasi-commercial in that an expense was involved for the services provided by the pilot or lodge, and as such, the safety of the operations was comparable to that of commercial aviation.

Due to the remote nature of these operations, the total number of guides and lodges involved in transporting clientele by air is not easily determinable. However, unofficial estimates from industry, state, and Federal sources indicate that there are approximately 270 state licensed guides in Alaska that incorporate an aircraft in their business, and upwards of 125 lodges in the state with the majority using an aircraft to transport clientele to the lodge and/or remote hunting and fishing areas.

The Safety Board is aware of and commends the FAA for its study of aviation commercial guiding activities within the State of Alaska. The study, which was completed in December 1992 by the FAA's Alaskan Region Flight Standards Division, was undertaken for the purpose of assessing the safety of air transportation associated with commercial guiding activities conducted under 14 CFR Part 91, versus 14 CFR Part 135, within the State of Alaska. Alaskan flight standards personnel informed the Safety Board that the findings of the study illuminate a need to elevate the standards for pilot guide/aero lodge operations currently conducted under 14 CFR Part 91. The Safety Board supports the FAA's efforts in this area but notes that the study was completed over a year ago. The Board believes, therefore, that the FAA should expedite its evaluation of the study and develop and implement measures that are aimed at providing the much-needed increased standards for this industry.

The Safety Board believes that the frequency with which causal factors and findings relate to insufficient pilot experience, qualifications, and training in many 14 CFR Part 91 pilot guide/aero lodge accidents underscores the need to develop and implement an increased level of standards for these types of operations. Informal discussions with pilot guides and lodge owners indicate that the industry's rank and file are aware of the need for a higher level of professionalism and safety.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Expedite rule making activity to amend 14 CFR Part 135 to establish minimum pilot certification, experience, qualification, and training requirements for pilot guide/aero lodge operations presently conducted under 14 CFR Part 91. (Class II, Priority Action)(A-94-99)
>
> Ensure that surveillance resources are adequate to give selected attention to the operations, equipment, and airmen associated with pilot guide/aero lodge operations. (Class II, Priority Action)(A-94-100)

Chairman VOGT and Members LAUBER, HAMMERSCHMIDT, and HALL concurred in these recommendations.

John A. Hammerschmidt

for ~~By~~: Carl W. Vogt
Chairman

National Transpo: n Safety Board
Washingto. .C. 20594

Brief of Accident

File No. - 0842 7/30/92 DILLINGHAM,AK A/C Reg. No. N67151 Time (Lcl) - 1100 ADT

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)

Type of Operation -BUSINESS
Flight Conducted Under -14 CFR 91
Accident Occurred During -MANEUVERING

Aircraft Damage
DESTROYED
Fire
ON GROUND

	Fatal	Injuries Serious	Minor	None
Crew	0	1	0	0
Pass	6	0	0	0

----Aircraft Information----
Make/Model - DE HAVILLAND DHC-2 MARK 1
Landing Gear - FLOAT
Max Gross Wt - 5090
No. of Seats - 8

Eng Make/Model - P & W R-985-AN14B
Number Engines - 1
Engine Type - RECIPROCATING-CARBURETOR
Rated Power - 450 HP

ELT Installed/Activated - YES-UNK/NR
Stall Warning System - NO

----Environment/Operations Information----
Weather Data
Wx Briefing - UNK/NR
Method - UNK/NR
Completeness - UNK/NR
Basic Weather - VMC
Wind Dir/Speed- 090/004 KTS
Visibility - 1.000 SM
Lowest Sky/Clouds - UNK/NR
Lowest Ceiling - 800 FT OVERCAST
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
BRISTOL BAY LDG,AK
Destination
TOGIAK RIVER CP,AK

ATC/Airspace
Type of Flight Plan - COMPANY (VFR)
Type of Clearance - NONE
Type Apch/Lndg - NONE

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
Runway Ident - N/A
Runway Lth/Wid - N/A
Runway Surface - N/A
Runway Status - N/A

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
COMMERCIAL
SE LAND,ME LAND,SE SEA

Age - 42
Biennial Flight Review
Current - YES
Months Since - 7
Aircraft Type - NA265

Medical Certificate - VALID MEDICAL-WAIVERS/LIMIT

Flight Time (Hours)

Total	- 8842	Last 24 Hrs	- 2
Make/Model	- 550	Last 30 Days	- 80
Instrument	- 440	Last 90 Days	- 120
Multi-Eng	- 1700	Rotorcraft	- UNK/NR

Instrument Rating(s) - AIRPLANE

----Narrative----
THE DESTINATION CAMP IS LOCATED ABOUT 50 MI SW OF THE DEPARTURE LODGE, AND IS SEPARATED BY MOUNTAINS WITH SOME PEAKS OVER 4,000 FT ASL. THE GENERAL AREA WEATHER INCLUDED LOW CEILINGS. THE OPERATOR STATED THAT SHORTLY BEFORE THE ACCIDENT HE OBSERVED THE YOUTH CREEK WEATHER "BETTER THAN 400 FEET... ". AND TOLD THE PILOT THAT IT APPEARED GOOD ENOUGH TO MAKE THE FLIGHT. THE PILOT STATED THAT AS HE FLEW UP YOUTH CREEK HE COULD SEE THAT THE PASS WAS CLOSED BY LOW CLOUDS AND ATTEMPTED TO REVERSE DIRECTION. THE PILOT STATED HE "MADE A HARD STEEP TURN, AND THE AIRPLANE STALLED..." THE PILOT SAID THE WEATHER WAS ABOUT 800 FT CEILING AND VISIBILITY OF 1 MI. WHEN THE PILOT WAS ADMITTED INTO THE HOSPITAL IMMEDIATELY FOLLOWING THE ACCIDENT, HE WAS DIAGNOSED AS HAVING AN INSULIN DEPENDENT DIABETIC CONDITION. HIS MEDICAL RECORDS CONTAIN NO EVIDENCE OF, AND THE PILOT DENIED ANY KNOWLEDGE OF, ANY PRE-ACCIDENT DIABETIC CONDITION.

File No. - 0842 7/30/92 DILLINGHAM,AK A/C Reg. No. N67151 Time (Lcl) - 1100 ADT

Occurrence #1 LOSS OF CONTROL - IN FLIGHT
Phase of Operation MANEUVERING - TURN TO REVERSE DIRECTION

Finding(s)
1. TERRAIN CONDITION - MOUNTAINOUS/HILLY
2. WEATHER CONDITION - LOW CEILING
3. IN-FLIGHT PLANNING/DECISION - DELAYED - PILOT IN COMMAND
4. PHYSICAL IMPAIRMENT(HYPOGLYCEMIA/DIET) - PILOT IN COMMAND
5. AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
6. STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #2 IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation MANEUVERING - TURN TO REVERSE DIRECTION

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident was:
THE PILOT'S DELAYED DECISION IN REVERSING COURSE AND HIS FAILURE TO MAINTAIN AIRSPEED DURING THE MANEUVER. FACTORS RELATED TO THE ACCIDENT WERE: MOUNTAINOUS TERRAIN AND A LOW CEILING.

National Transpor n Safety Board
Washingto .C. 20594

Brief of Accident

File No. - 0536 9/01/92 FORT YUKON,AK A/C Reg. No. N8070Z Time (Lcl) - 1742 ADT

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)
Type of Operation -BUSINESS
Flight Conducted Under -14 CFR 91
Accident Occurred During -LANDING

Aircraft Damage
SUBSTANTIAL
Fire
NONE

Injuries	Fatal	Serious	Minor	None
Crew	0	0	1	0
Pass	0	1	0	1

----Aircraft Information----
Make/Model - CESSNA 206
Landing Gear - TRICYCLE-FIXED
Max Gross Wt - 3600
No. of Seats - 2

Eng Make/Model - CONTINENTAL IO-520A
Number Engines - 1
Engine Type - RECIP-FUEL INJECTED
Rated Power - 285 HP

ELT Installed/Activated - YES/YES
Stall Warning System - YES

----Environment/Operations Information----
Weather Data
Wx Briefing - NO RECORD OF BRIEFING
Method - N/A
Completeness - N/A
Basic Weather - VMC
Wind Dir/Speed- LIGHT AND VARIABLE
Visibility - 50.0 SM
Lowest Sky/Clouds - UNK/NR
Lowest Ceiling - 7000 FT OVERCAST
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
RED SHEEP CREEK,AK
Destination
SAME AS ACC/INC

ATC/Airspace
Type of Flight Plan - NONE
Type of Clearance - NONE
Type Apch/Lndg - FORCED LANDING

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
Runway Ident - N/A
Runway Lth/Wid - N/A
Runway Surface - N/A
Runway Status - N/A

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
PRIVATE
SE LAND,SE SEA

Age - 44
Biennial Flight Review
Current - YES
Months Since - 3
Aircraft Type - PA-18

Medical Certificate - VALID MEDICAL-NO WAIVERS/LIMIT
Flight Time (Hours)
Total - 4900
Make/Model- 720
Instrument- 10
Multi-Eng - UNK/NR
Last 24 Hrs - 5
Last 30 Days- 148
Last 90 Days- 155
Rotorcraft - UNK/NR

Instrument Rating(s) - NONE

----Narrative----
THE PILOT LOADED THE 2 PASSENGERS AND GEAR IN THE AIRPLANE TO THE EXTENT THAT IT TOOK SUCCESSIVE ATTEMPTS TO CLOSE THE DOOR DUE TO THE GEAR WHICH "FILLED UP THE AIRPLANE TO THE ROOF." THE REAR PAX HAD TO LAY ON TOP OF MEAT AND CAMP SUPPLIES WITH 2 DOGS IN HIS LAP. THE AIRPLANE WAS ESTIMATED TO BE 772 LBS OVER MAX GROSS WEIGHT AT TAKEOFF. AFTER TAKEOFF THE AIRPLANE CLIMBED SLOWLY FOR APRX 55 MIN AT TAKEOFF POWER. A "SLEDGEHAMMER" SOUND PRECEDED THE APPEARANCE OF OIL FLOWING INTO THE CABIN AREA. NO REDUCTION OF POWER WAS OBSERVED. THE OIL PRESSURE BEGAN DROPPING RAPIDLY, AND THE PILOT MADE A PRECAUTIONARY LANDING ON A BEACH. THE AIRPLANE NOSED OVER IN GRASS. ENGINE TEARDOWN EXAMINATION REVEALED THAT THE #6 CYLINDER HAD FAILED THROUGH THE HEAD-TO-BARREL THREADED JOINT. METALLURGICAL EXAMINATION REVEALED THAT THE FAILURE WAS THE RESULT OF FATIGUE CRACKING IN THE CYLINDER HEAD CASTING. THIS TYPE OF FAILURE OCCURS WHEN THE CYLINDER IS OPERATED AT ELEVATED TEMPERATURES (ABOVE MAXIMUM ALLOWABLE) FOR A CONSIDERABLE PERIOD OF TIME.

File No. - 0536 9/01/92 FORT YUKON,AK A/C Reg. No. N8070Z Time (Lcl) - 1742 ADT

Occurrence #1 LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation CRUISE - NORMAL

Finding(s)
1. AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND
2. ENGINE ASSEMBLY,CYLINDER - OVERTEMPERATURE
3. POWERPLANT CONTROLS - IMPROPER USE OF - PILOT IN COMMAND
4. ENGINE ASSEMBLY,CYLINDER - FATIGUE

Occurrence #2 FORCED LANDING
Phase of Operation LANDING - FLARE/TOUCHDOWN

Occurrence #3 NOSE OVER
Phase of Operation LANDING - ROLL

Finding(s)
5. TERRAIN CONDITION - HIGH VEGETATION
6. TIE DOWN - NOT PERFORMED - PILOT IN COMMAND

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident was:
FATIGUE FAILURE OF AN ENGINE CYLINDER PRECIPITATED BY THE PILOT-IN-COMMAND INTENTIONALLY EXCEEDING THE ENGINE PERFORMANCE RATINGS IN ORDER TO SUSTAIN FLIGHT IN THE GROSSLY OVERWEIGHT CONDITION. A FACTOR CONTRIBUTING TO THE ACCIDENT WAS THE HIGH GRASS. A FACTOR CONTRIBUTING TO THE SEVERITY OF THE PASSENGER'S INJURY WAS THE UNSECURED CAPGO.

National Transpo n Safety Board
Washingtc. .C. 20594

Brief of Accident

File No. - 1147 7/31/93 EL MONTE,CA A/C Reg. No. N445RH Time (Lcl) - 1349 PDT

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)

Type of Operation -PERSONAL
Flight Conducted Under -14 CFR 91
Accident Occurred During -TAKEOFF

Aircraft Damage
DESTROYED
Fire
ON GROUND

	Injuries			
	Fatal	Serious	Minor	None
Crew	1	0	0	0
Pass	2	0	0	0

----Aircraft Information----
Make/Model - ROBINSON R44
Landing Gear - SKID
Max Gross Wt - 2400
No. of Seats - 4

Eng Make/Model - LYCOMING O-540-F1B5
Number Engines - 1
Engine Type - RECIPROCATING-CARBURETOR
Rated Power - 260 HP

ELT Installed/Activated - YES/NO
Stall Warning System - NO

----Environment/Operations Information----
Weather Data
Wx Briefing - NO RECORD OF BRIEFING
Method - N/A
Completeness - N/A
Basic Weather - VMC
Wind Dir/Speed- 180/008 KTS
Visibility - 7.0 SM
Lowest Sky/Clouds - 18000 FT SCATTERED
Lowest Ceiling - NONE
Obstructions to Vision- NONE
Precipitation - NONE
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
SAME AS ACC/INC
Destination
LOCAL

ATC/Airspace
Type of Flight Plan - NONE
Type of Clearance - VFR
Type Apch/Lndg - NONE

Airport Proximity
ON AIRPORT

Airport Data
EL MONTE
Runway Ident - 19
Runway Lth/Wid - 3995/ 75
Runway Surface - ASPHALT
Runway Status - DRY

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
PRIVATE

HELICOPTER

Instrument Rating(s) - NONE

Age - 30
Biennial Flight Review
Current - YES
Months Since - 8
Aircraft Type - R22

Medical Certificate - VALID MEDICAL-NO WAIVERS/LIMIT

Flight Time (Hours)

Total	640	Last 24 Hrs	UNK/NR
Make/Model	60	Last 30 Days	10
Instrument	UNK/NR	Last 90 Days	50
Multi-Eng	UNK/NR	Rotorcraft	640

----Narrative----
THE PILOT AND TWO PASSENGERS DEPARTED IN THE HELICOPTER FROM THE APPROACH END OF RUNWAY 19. WITNESSES REPORTED THAT THE HELICOPTER ACCELERATED TO ABOUT 50 KNOTS AND CLIMBED TO BETWEEN 50 AND 100 FEET ABOVE THE RUNWAY. THEY SAID IT THEN SUDDENLY PITCHED DOWN, ROLLED TO THE RIGHT, AND CRASHED ON THE RUNWAY. AN EXAMINATION OF THE WRECKAGE DISCLOSED THAT IT HAD IMPACTED IN ABOUT A 35 DEGREE NOSE DOWN ATTITUDE AND A 30 DEGREE RIGHT BANK. THE HELICOPTER WAS DESTROYED BY IMPACT AND POST IMPACT FIRE; MANY OF THE FLIGHT CONTROL SYSTEM COMPONENTS WERE FOUND FRACTURED AND/OR FIRE DAMAGED. THIS INCLUDED A FRACTURE AT THE LOWER END OF THE CYCLIC CONTROL (STICK) ASSEMBLY. METALLURGICAL EXAMINATION OF THIS FRACTURE REVEALED EVIDENCE OF FATIGUE. THE HELICOPTER, WHICH HAD BEEN CERTIFICATED IN DECEMBER 1992, HAD ACCUMULATED 174 HOURS OF FLIGHT TIME SINCE BEING MANUFACTURED.

File No. - 1147 7/31/93 EL MONTE.CA A/C Reg. No. N445RH Time (Lcl) - 1349 PDT

Occurrence #1 AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation TAKEOFF - INITIAL CLIMB

Finding(s)
1. ROTORCRAFT FLIGHT CONTROL,CYCLIC CONTROL - FATIGUE
2. CYCLIC - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #2 LOSS OF CONTROL - IN FLIGHT
Phase of Operation TAKEOFF - INITIAL CLIMB

Occurrence #3 IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation DESCENT - UNCONTROLLED

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident was:
FATIGUE FAILURE OF THE CYCLIC CONTROL (STICK) ASSEMBLY, WHICH RESULTED IN LOSS OF CYCLIC (PITCH & ROLL) CONTROL.