

SP-20

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Log 1467

ISSUED: August 24, 1983

Forwarded to:

Honorable J. Lynn Helms
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-83-56

On March 24, 1983, a Mitsubishi airplane Model MU-2B-60, N72B, crashed near Jeffersonville, Georgia, killing all four persons aboard. The airplane, engaged in an air-taxi operation, disappeared from radar at an altitude of 18,000 feet shortly after the pilot had established initial contact with the Atlanta Air Route Traffic Control Center. Despite an intense and continuing investigation, the causal circumstances of the accident remain undetermined.

The Mitsubishi MU-2 twin-turboprop airplane has been involved in a series of fatal accidents in the past several years. These accidents, as indicated in the following summary for the period 1975 through 1983, relate primarily to (1) engine failure malfunction in various phases of flight; (2) uncontrolled collisions with the ground, often after rapid descent from relatively high altitudes; and (3) controlled collisions with the ground during cruise flight or instrument landing approaches. The puzzling circumstances of several of the accidents suggest that some of the causal circumstances may be design-related or design-induced.

Engine Failure/Malfunction

Several of the engine failure/malfunction accidents have involved flameout of one engine, while others have involved complete loss of power on both engines. The causes of some of these accidents are undetermined, while the causes of others involve fuel starvation, fuel exhaustion, and turbine or compressor rotor bearing failures. For example, on August 3, 1979, seven persons were killed in the engine failure/malfunction accident at Hays, Kansas, when the pilot of a Mitsubishi MU-2B attempted a go-around following a landing approach with an engine inoperative. (NTSB brief of accident, file 3-2769. 1/) Investigation disclosed that the forward compressor assembly rotor shaft bearing had failed. On November 22, 1981, the pilot of a Mitsubishi MU-2B was killed when he was forced to ditch the airplane following an engine failure/malfunction near Pago Pago, American Samoa (file 3-3415). The pilot radioed that he had experienced a complete loss of power on both engines and was unable to transfer fuel from the tip tanks to the main tanks. On September 13, 1982, at Hayden, Colorado, six persons aboard a

1/ NTSB file numbers are included for ordering purposes only.

MITSUBISHI MD-2 FATAL ACCIDENT SUMMARY
U.S. GENERAL AVIATION
1975 THROUGH 1983

<u>DATE</u>	<u>LOCATION</u>	<u>TYPE OF ACCIDENT</u>	<u>PHASE OF FLIGHT</u>	<u>REMARKS</u>
11/13/75	Jefferson City, TN	Engine Failure/Malfunction Stall	Landing: Traffic Pattern-Circling Landing	Engine Failure for undetermined reasons. Pilot diverted attention from operation of aircraft; operated engine controls improperly.
* 12/26/75	Nr. Rollinsville, CO	Controlled Collision With Ground	Normal Cruise	Continued VFR flight into adverse weather; high obstructions, low ceiling, snow.
2/8/76	Easton, MD	Engine Failure/Malfunction Stall/Spin	Landing-Final Approach Landing-Final Approach	Engine failure for undetermined reasons. Pilot diverted attention from operation of aircraft.
* 2/18/76	Areyville, NY	Stall	Landing-Initial Approach	Pilot not familiar with aircraft. Attempted operation beyond experience/ability level. IFR flight, icing conditions.
1/7/77	Rochester, MN	Engine Failure/Malfunction Stall/Spin	Takeoff-Initial Climb Takeoff-Initial Climb	Engine failure for undetermined reasons. Improper flap position (full down). IFR flight, low ceiling, snow.
3/18/77	Nr. Austin, TX	Uncontrolled Collision With Ground	Uncontrolled Descent	Cause of accident undetermined.
* 4/5/77	Bronx, NY	Engine Failure/Malfunction Controlled Collision With Ground	Landing-Initial Approach Landing-Initial Approach	Fuel Exhaustion due to inadequate preflight planning. Erratic fuel quantity gauge. IFR flight, low ceiling, fog.

* Accidents not pertinent to the safety recommendation.

<u>DATE</u>	<u>LOCATION</u>	<u>TYPE OF ACCIDENT</u>	<u>PHASE OF FLIGHT</u>	<u>REMARKS</u>
* 8/25/78	Nr. Raton, New Mexico	Controlled Collision With Ground	Descending	Pilot's efficiency and judgement impaired by alcohol. Miscalculated altitude and clearance.
8/28/78	Bedford, NH	Uncontrolled Collision With Ground	Uncontrolled Descent	Pilot diverted attention from operation of aircraft. Reported a compass problem.
* 6/18/79	New Orleans, LA	Propeller Struck Passenger	Static - Idling Engine(s)	Passenger impaired by alcohol
8/3/79	Hays, KS	Engine Failure/Malfunction Stall/Mush	Normal Cruise Landing-Go-Around	Engine failure due to failure of compressor assembly rotor shaft bearing
11/1/79	Nashville, TN	Undershoot Collided With Wires/Poles	Landing-Final Approach Landing-Final Approach	Inadequate supervision of copilot by pilot-in-command. Pilot fatigue, ground fog.
11/26/79	Nr. Post Oak, TX	Uncontrolled Collision With Ground	Uncontrolled Descent	Pilot's efficiency and judgement impaired by alcohol and fatigue.
12/21/79	Provo, UT	Controlled Collision With Ground	Landing: Traffic Pattern- Circling	Improper preflight planning. Improper IFR operation (circling).
2/14/80	Nr. Houston, TX	Undershoot Collided With Trees	Landing-Final Approach Landing-Final Approach	Improper IFR operation. Incorrect altimeter setting. Wind shear, rain, fog, high obstructions. crashed during ILS approach about 5 miles behind Boeing 727,
2/23/80	New Orleans, LA	Controlled Collision With Water	Landing-Final Approach	Improper IFR operation, low ceiling, fog. Crashed 400 yards left of localizer, below glide slope.

<u>DATE</u>	<u>LOCATION</u>	<u>TYPE OF ACCIDENT</u>	<u>PHASE OF FLIGHT</u>	<u>REMARKS</u>
* 3/21/80	Cincinnati, OH	Propeller Struck Ground Crewman	Startup Starting Engines(s)	Line boy backed into rotating propeller
* 4/23/80	Bonderson, NV	Stall/Spin	Landing Traffic Pattern Firing	Pilot was attempting precautionary landing due to low fuel after initiating flight with empty fuel system deficiencies.
12/6/80	Ramsey, MN	Uncontrolled Collision With Ground	Landing Initial Approach	Pilot failed to maintain flying speed. icing conditions present.
* 4/19/81	Lajitas, TX	Collided With Wires/Poles	Takeoff Initial Climb	Pilot attempting downwind, upslope takeoff near maximum gross weight. Failed to use flaps. High density altitude.
4/23/81	Alpena, MI	Controlled Collision With Ground	Landing Final Approach	Improper IFR operation. Crashed 1.6 miles short of runway during ILS approach. Low ceiling, rain, fog.
9/2/81	Nr. McLeod, TX	Stall/Spin	In-Flight: Other	Stall/Spin entered at about 21,000 feet. Airframe icing believed to be involved.
9/6/81	Nr. Riverton, WY	Uncontrolled Collision With Ground	In-Flight: Climb to Cruise	Pilot lost control while climbing through about 15,000 feet. Airframe icing believed to be involved.
11/5/81	Saratoga, WY	Uncontrolled Collision With Ground	Takeoff Initial Climb	Cause of accident undetermined. Airplane crashed in a descending right turn shortly after takeoff.

<u>DATE</u>	<u>LOCATION</u>	<u>TYPE OF ACCIDENT</u>	<u>PHASE OF FLIGHT</u>	<u>REMARKS</u>
11/18/81	Nr. Eagle, CO	Controlled Collision With Ground	Decending	Improper IFR operating. Dark night with overcast ceiling.
11/19/81	Nr. Jacksonville, FL	Uncontrolled Collision With Water	Uncontrolled Descent	Cause of accident undetermined.
11/22/81	Nr. Pago Pago, American Samoa	Engine Failure/Malfunction Ditching	Normal Cruise Landing: Level off/Touchdown	Fuel starvation for undetermined reasons. Pilot stated he was unable to transfer fuel from tip tanks to main tanks.
* 4/20/82	La Fayette, GA	Controlled Collision With Ground	Normal Cruise	Pilot continued VFR flight into known adverse weather (haze, low ceiling) and crashed in mountainous/hilly terrain.
9/12/82	Hayden, CO	Engine Failure/Malfunction	Takeoff: Initial Climb	Following left engine failure, airplane rolled left and crashed. Rear turbine rotor shaft bearing improperly installed.
1/27/83	Scottsdale, AZ	Controlled Collision With Ground	VFR Approach-Base Turn	Attempting a night visual approach. Struck ground during descent about 2 miles from the runway. Rough, rainy weather
3/24/83	Jeffersonville, GA	Uncontrolled Collision With Ground	Normal Cruise	Airplane disappeared from radar at 18,000 feet shortly after pilot contact with Atlanta ARTC Center. Both wings, left engine and propeller, and empennage, separated in-flight.

Mitsubishi MU-2-25K were killed immediately after takeoff as a result of a failure/malfunction of the left engine. The airplane rolled to the left and crashed into the ground in a nosedown, inverted attitude. Investigation disclosed that the rear turbine rotor shaft bearing had been improperly installed. The causes of the engine failure/malfunction occurrences (see summary) at Jefferson City, Tennessee, on November 13, 1975 (file 3-4157); at Easton, Maryland, on February 8, 1976 (file 3-0685); and at Rochester, Minnesota, on January 7, 1977 (file 3-1406), remain undetermined.

The continued occurrence of these types of accidents, the Safety Board believes, warrants a certification review of the MU-2 engines, fuel system, and engine inoperative characteristics to determine whether the potential exists for any system design improvements; improved maintenance procedures; improved service or repair instructions; or changes in operational procedures relative to preflight inspection, engine inoperative procedures, or the in-flight management, expenditure, and transfer of fuel from the several fuel tanks aboard the airplane.

Uncontrolled Collisions With Ground/Water

In addition to the accident at Jeffersonville, Georgia, other uncontrolled collisions with the ground/water involving the MU-2 (see summary) include fatal accidents near Jacksonville, Florida, on November 19, 1981 (file 3-3605); at Saratoga, Wyoming, on November 5, 1981 (file 3-3668); at McLeod, Texas, on September 9, 1981 (file 3-3593); at Riverton, Wyoming, on September 6, 1981 (file 3-3667); at Ramsey, Minnesota, on December 6, 1980 (file 3-3798); at Bedford, New Hampshire, on August 28, 1978 (file 3-4348); and near Austin, Texas, on March 18, 1977 (file 3-0563).

The MU-2 which crashed near Jacksonville, Florida, had been operating normally in clear skies at approximately 12,000 feet just before plunging into the ocean. The MU-2 which crashed at Saratoga, Wyoming, rolled suddenly and dove to the ground immediately after takeoff. The MU-2 which crashed at Austin, Texas, was being flown by a Mitsubishi Aircraft International corporate-executive pilot and was observed to dive to the ground from an altitude of several thousand feet. The causes of these accidents, as well as the accident at Jeffersonville, Georgia, remain undetermined.

Airframe icing is believed to have contributed to the accidents at McLeod, Riverton, and Ramsey. In the McLeod accident, the airplane entered a stall/spin at 21,000 feet from which the pilot did not or could not recover. In the Riverton accident, the pilot lost control of the airplane while climbing through approximately 15,000 feet. Although the pneumatic deicer boots were known to be leaking, the airplane's encounter with ice would have lasted only a minute or two. At Ramsey, the pilot lost control of the airplane during the initial landing approach after a loss of flying speed for undetermined reasons. These accidents indicate the possibility that ice accumulation on the MU-2 airframe may be unusually critical to the airplane's performance. This characteristic may relate to the unusually high wing loading of the Mitsubishi MU-2 and the use of spoilers for lateral control, in relation to comparable airplanes that have lower wing loadings and use ailerons for lateral control. As a result, the Safety Board believes that a review of the airplane's icing certification should be conducted.

Controlled Collisions with Ground/Water

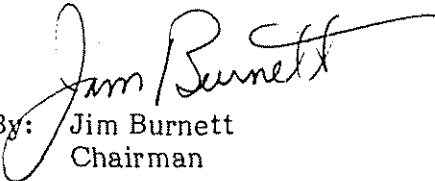
Controlled collisions with the ground/water involving the MU-2 included occurrences near Eagle, Colorado, on November 18, 1981 (file 3-3612); at Alpena, Michigan, on April 23, 1981 (file 3-1907); at New Orleans, Louisiana, on February 23, 1980 (file 3-0168); at Provo, Utah, on December 21, 1979 (file 3-3693); and several others as indicated in the

accident summary. All of the aforementioned accidents occurred during the landing or landing approach phase of flight in instrument meteorological conditions (IMC) where precise trim, altitude, glidepath, speed, and directional control are critical. A pilot's workload under these conditions, or the ease with which he can control these factors, is strongly influenced by the airplane's handling characteristics in the landing configuration. Consequently, because of continued involvement of the MU-2 in the above types of accidents, the Safety Board believes that such handling characteristics should also be evaluated as an important, integral part of an MU-2 certification review program.

In view of the continued involvement of the Mitsubishi MU-2 in fatal accidents involving engine failure or malfunction and sudden unexplained loss of control, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Conduct a special certification review of Mitsubishi MU-2 airplanes relative to the engines, fuel system, autopilot, and flight control systems; flight in known icing conditions; engine inoperative characteristics; and handling characteristics during IMC landing approaches; and take the appropriate action to correct any deficiencies identified. (Class II, Priority Action) (A-83-56)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS and ENGEN, Members, concurred in this recommendation. BURSLEY, Member, did not participate.


By: Jim Burnett
Chairman