SA-383

CIVIL AERONAUTICS BOARD

File No. 1-001

AIRCRAFT ACCIDENT REPORT

ADOPTED: March 10, 1967 **RELEASED:** March 16, 1967

AAXICO AIRLINES, INC.
DOUGLAS DC-6A, N6541C
WEST SLOPE OF MT. RAINIER, WASHINGTON
APRIL 23, 1965

SYNPOSIS

On April 23, 1965, at 1423 P.s.t., an AAXICO Airlines, Inc., Douglas DC-6A, N6541C, crashed on the west slope of Mt. Rainier, Washington. The accident site was 40.2 nautical miles southeast of the Seattle VORTAC, on the 125-degree radial, at an elevation of 10,200 feet m.s.l. The aircraft was being operated as Logair Flight 1422A, on a Visual Flight Rules (VFR) flight from Boeing Field, Seattle, Washington, to Hill Air Force Base (AFB), Utah. All five crewmembers received fatal injuries as a result of the crash.

The flight was attempting to obtain an Instrument Flight Rules (IFR) clearance when it struck the snow covered glacier. The aircraft was destroyed by impact. There was no fire.

The Board determines that the probable cause of this accident was the improper correlation of the aircraft position with respect to obstructing terrain while continuing the flight on a VFR flight plan in instrument weather conditions.

1. INVESTIGATION

1.1 History of Flight

AAXICO Airlines, Inc., Logair[1/] Flight 1422A, a Douglas DC-6A, N6541C was operating as a Military Air Transport Service (MATS) cargo flight between McClella AFB, California, and Hill AFB, Utah.

The flight departed McClellan AFB, California, at 1302[2/] April 22, 1965, as Logair Flight 1422A, for Minot AFB, North Dakota, with scheduled stops at Castle AFB, California, Norton AFB, California, Nellis AFB, Nevada, and Hill AFB, Utah. The flight arrived at Minot AFB at 0246 April 23. No mechanical difficulties or discrepancies were reported and the aircraft was turned over to the outgoing crew as being in good mechanical condition.

From Minot Logair 6541C was dispatched to Hill AFB with scheduled stops at Glasgow AFB, Montana, Malmstrom AFB, Montana, Fairchild AFB, Washington, Larson AFB Washington, McChord AFB and Boeing Field, Washington. The flight overflew

1/ Logistics Air Support flight being conducted under contract with the USAF Air Materiel Command.
2/ All times herein are Pacific standard based on the 24-hour clock.

Glasgow AFB, due to weather. Thereafter, the flight progressed in a routine manner, accomplishing all stops and landed at McChord AFB at 1118 on April 23.

Shortly after arrival at McChord AFB a person identifying himself as, "a pilot on the Logair aircraft" called the base weather station at McChord and inquired if it were possible to go VFR from McChord to Boeing Field, thence to Hill AFB. Whether the caller was the captain or first officer is not known. However, he received a weather briefing which established that VFR flight conditions existed over the proposed route. Lowering ceilings were forecast over southeastern Idaho and Utah, but with improving conditions anticipated by late afternoon. The pilot advised he would file FVR and if necessary, could refile in the air if southeastern Idaho and Utah did not improve. The pilot was also provided with a wind forecast which called in part for 240 degrees, 5 to 10 knots, at 10,000 feet from Boeing to Pendleton.

A VFR flight plan was filed (Form DD175) with MATS Operations at McChord AFB for the flight from McChord AFB to Hill AFB, Ogden, Utah, with an intermediate stop at Boeing Field, Seattle, Washington. The estimated time en route to Boeing Field was 15 minutes. The estimated time from Boeing Field to Hill AFB was 2 hours and 30 minutes. At 1230, Logair 6541C departed McChord AFB, VFR for Boeing Field and arrived at the gate area at 1243. The flight was routine to Boeing Field.

Ground operations at Boeing Field were routine. The crewmembers appeared normal to persons acquainted with them. There was no known discussion by the flight crew of the type of flight planned or of weather conditions which were expected to be encountered en route. No aircraft maintenance was performed at Boeing Field.

AAXICO had two preplanned flight plans that were required to be followed from Boeing Field to Hill AFB, one for IFR and one for VFR. The specified VFR routing which was filed for this flight was: direct to Seattle VOR, Airway V-4 to Pendleton, Oregon, direct to a point 22 nautical miles northeast of Boi Idaho on the 028-degree radial of the Boise VOR, direct to Burley, Idaho, Airw V-101 to Ogden, and direct to Hill AFB. The highest minimum en route altitude specified is 11,500 feet between Burley, Idaho, and Ogden, Utah.

At 1402 the crew of Logair 6541C contacted the Boeing Tower and stated, "Boeing Tower Logair four one Charlie Taxiing VFR Hill Field over." The controller replied, "Four one Charlie runway one three, wind two zero zero at one six, altimeter three zero two three, time zero two." The crew acknowledged. Logair 6541C was cleared for takeoff and departed Boeing Field on runway 13 at 1405. The aircraft's departure time was then forwarded to the Seattle Flig Service Station (FSS). At 1411, the flight reported its position to the Seatt FSS on frequency 126.7 mcs., as 17 miles south of Seattle. At this time the flight requested a radio frequency on which to contact the Seattle Air Route Traffic Control Center (ARTCC). The FSS at Seattle relayed the information that 133.5 mcs. was the frequency to be used and the crew acknowledged.3/

3/ The ARTCC tape revealed the coordination effected between the FSS and the ARTCC controller concerning the flight's request for a frequency took plac between 1411:35 and 1412:05.

The following times specified are to the nearest second and have been taken from the FAA transcript of the Seattle ARTCC tape recording of voice communications.

At 1413:03 the ARTCC received the following call from Logair 6541C on 133.5 mcs: "Seattle Center Logair four one Charlie on one thirty three five over." At 1413:06 the ARTCC controller replied, "Logair four one Charlie Seattle Stand by."

At 1413:50 the ARTCC initiated the following message: "Logair four one Charlie Seattle Center go ahead." At 1414:00 the message was repeated; there was no reply received from the flight. At approximately 1414 the Seattle FSS specialist heard the flight calling his station on frequency 135.9 mcs. Attempts by the Seattle FSS to contact the flight on this frequency were unsuccessful.

About 1417 Logair 6541C called the FSS (on 126.7 mcs.) and two-way voice communications were established. Written records of the Seattle FSS revealed the aircraft's position was reported by the crew to be 33 nautical miles on Airway V-4,[4]/ climbing through 9,000 feet. At this time the crew requested an IFR clearance via V-4, V-101 Ogden, direct to Hill AFB, at 15,000 feet.

The FSS specialist then contacted the Seattle ARTCC via interphone to forward the information received and to obtain the requested clearance for the flight. Seattle FSS records reveal that the pilot's request for the clearance was forwarded to the ARTCC at 1418. The ARTCC tape recording reveals this coordination was effected between 1421:05 and 1421:30. The ARTCC's instructions were, ". . . ATC clears Logair four one Charlie contact Seattle Center on one two zero point three for IFR clearance." The Seattle FSS delivered the message to Logair 6541C.

Between 1421:30 and 1421:55 the flight plan data received from the Seattle FSS were being coordinated between the Center departure controllers. At 1421:55 the Center primary radar controller received the following call from the flight: "Seattle Center Logair four one Charlie one two zero point three." The controller acknowledged the call and radio communications were established. At this time the crew reported they were standing by for their IFR clearance to Hill. In response to this the controller replied, "Logair four one Charlie Roger en route to Hill Field and we don't seem to have your flight plan handy, say again your requested flight plan."

At 1422:21 the crew repeated the routing and altitude previously requested. The controller ascertained that the aircraft had no transponder and learned that the aircraft had DME installed. The controller then requested the aircraft's position. The crew's reply and last radio transmissions follow:

1422:37 (6541C) - "OK we're (up on)[5]/the one two five degree radial presently thirty-nine miles out."

4/ Airway V-4 is constituted in part by the 102-degree radial of the Seattle VOR.

5/ Unintelligible word/s - best determination is that words are "UP-ON."

1422:49 (ARTCC) - "Roger and that, and is that from the Seattle?"
1422:52 (6541C) - "Affirmative."
1423:00 (ARTCC) - "Roger four one Charlie what's your altitude now?"
1423:03 (6541C - "We're climbing through ten point five, VFR."
1423:18 (ARTCC) - "Four one Charlie Roger and what is your position with relation to Mt. Rainier?"

There was no answer to this request and no further contact with the flight.

The accident occurred at 46°51'35" North Latitude and 121°48'07" West Longitude, 40.2 nautical miles southeast of the Seattle VORTAC at the 10,200-foot level on the west slope of Mt. Rainier, whose summit is 14,410 feet. The time was established as 1423:18 April 23, 1965. The accident occurred during daylight hours.

1.2 Injuries to Personnel

Injuries	Crew	Passengers	Others
Fatal	5	0	0
Nonfatal	0	0	0
None	0	0	

Post-mortem examinations of the flight crewmembers revealed no evidence of any human factor condition that would have affected their flight abilities.

1.3 Damage to Aircraft

The aircraft was destroyed. The Nos. 1 and 2 engines and fragmented portions of the left wing remained inbedded in the glacier ice at the 10,200-foot elevation on the west slope of the mountain. The remaining portion of the wreckage slid down the face of the glacier and came to rest at an elevation of about 9,600 feet on a relatively level area on the glacier. The No. 3 engine with its nacelle had separated from the wing. The right outboard wing and the No. 4 engine had separated from the aircraft. The rear fuselage broke off just forward of the cargo door. The forward fuselage and cockpit area broke off at approximately Station 231. The right inboard wing had broken off and was found inverted close to the aft fuselage.

1.4 Other Damage

There was no damage to property on the ground.

1.5 Crew Information

Captain Alvin P. Petry, age 40, possessed airline transport pilot certificate No. 1387315 with airplane multiengine and single-engine land and DC-6/7 ratings. He also possessed a flight instructor certificate with airplane and instrument ratings. His latest Federal Aviation Agency (FAA) en route inspection was accomplished on July 20, 1964, his latest company line check on July 21, and July 23, 1964, and his last proficiency check was completed on February 23, 1965. All of the above inspections and checks were satisfactorily accomplished in

Douglas DC-6 aircraft. Captain Petry held a Class I medical certificate issued January 5, 1965, with no limitations. He had a total of 6,861.7 hours of which 426.6 were instrument hours and 4,088.4 hours were in Douglas DC-6 aircraft. Within the 90-day period preceding the accident he had flown a total of 244.7 hours, all in Douglas DC-6 aircraft. He had flown 70.7 hours in the 30-day period preceding the accident.

First Officer William Franklin Newland, age 42, possessed airline transport pilot certificate No. 82646-41 with airplane multiengine land and Douglas DC-3, DC-4, and Curtiss C-46 ratings, and commercial privileges in airplane single-engine land. He also held a flight instructor certificate with airplane and instrument ratings, ground school certificate No. 45619-40, and flight engineer certificate No. 1180429. His last company line check as a copilot in Douglas DC-6 aircraft was on October 10, 1964, and his latest first officer proficiency check in Douglas DC-6 aircraft was on October 16, 1964. These two checks were satisfactorily passed. He held a first-class medical certificate which was issued on December 8, 1964, with the limitation that he wear correcting glasses while exercising the privileges of his airman certificate. First Officer Newland had a total of 17,310.1 flying hours of which 1,944.7 were instrument hours and 5,214.2 hours were in Douglas DC-6 aircraft.

Flight Engineer James Irwin Middleton, age 36, held flight engineer certificate No. 1341521 and a mechanic certificate No. 1220145 with an airframe and powerplant rating. He had been an FAA approved check flight engineer on Douglas DC-6/7 aircraft since January 26, 1962, and had successfully passed his latest proficiency check on August 17, 1964. Mr. Middleton had a total of 7,097.9 flight hours of which 6,226.9 hours were in Douglas DC-6 aircraft and of these he had 167.8 hours in the 90-day period preceding the accident. He had flown 73.2 hours in the last 30 days before the accident. His second-class medical certificate was issued on October 9, 1964, with no limitations.

Flight Engineer Observer Carl Washington Baker, age 55, held flight engineer certificate No. 1121310 and mechanic certificate No. N-99-69 with an airframe and powerplant rating. He possessed commercial pilot certificate No. 12855 with an airplane single and multiengine land and instrument ratings. His last engineer proficiency check was accomplished on April 20, 1965, with the comment that his performance was acceptable to a minimal degree only. His second-class medical certificate was dated October 24, 1964, with the limitation that he wear correcting glasses while exercising the privileges of his airman certificate. Mr. Baker had a total of 15,400 flying hours of which 2,500 hours were in Douglas DC-6 and 500 hours were in DC-7 aircraft.

Flight Engineer Observer Walter Paul Bryant, age 32, possessed flight engineer certificate No. 1623451 and mechanic certificate No. 1368275 with airframe and powerplant rating. He also held commercial pilot certificate No. 1338588 with airplane single and multiengine land and instrument ratings. His last flight engineer proficiency check was accomplished April 19, 1965. He possessed a second-class medical certificate issued October 21, 1964, with no limitations. Mr. Bryant had a total of 4,000 hours of which 10 hours were in Douglas DC-6 aircraft.

Records disclosed that both Captain Petry and First Officer Newland had flown into McChord AFB and/or Boeing Field twice (including the subject flight)

in the 12-month period preceding the accident. The prior flight was conducted on April 6, 1965.

The following applies to all five of the aforementioned crewmembers:

Hours flown during the 24-hour period prior to this flight - zero

Hours flown during this flight - 3.6

Duty time in the last 24 hours - 11.6

Rest period of at least 24 hours prior to this flight.

Captain Philip H. Browne, chief pilot for AAXICO, listened to the tape recording of communications between Flight 1422A and Boeing Field Tower and the Seattle ARTCC. He stated that he was very familiar with the voice of Captain Petry as heard both directly and through radio communications or reproduction. He further said that all communications he heard were made by one voice, and through its tone, inflection and mannerism of speech, was definitely identifiable to him as that of Captain Petry.

1.6 Aircraft Information

N6541C was a Douglas DC-6A, manufactured May 7, 1958. The aircraft prior to this accident had flown a total of 18,315:49 hours, 6,807:30 hours since overhaul, 151:03 hours since No. 11 periodic inspection, 39:51 hours since last line check, and 12:34 hours since last station check and preflight. The aircraft was powered by four Pratt & Whitney R-2800-CB 17 engines. Propellers installed were Hamilton Standard, model 43E60.

Maintenance records revealed that the aircraft, powerplants and components had been current and complied with the standards prescribed by Federal Aviation Regulations. Maintenance records revealed no evidence of discrepancies. There was no maintenance required on the aircraft prior to the flight and no discrepancies were reported during the flight.

The aircraft was fueled with 1,121 gallons of 115/145 aviation gasoline at Boeing Field making a total of 2,000 gallons on departure.

The gross weight at take-off from Boeing Field was computed to be 90,461 pounds with a center of gravity of 23.9 percent Mean Aerodynamic Chord (MAC). Both were within allowable limits.

1.7 Meteorological Information

It was determined that about 1115 on April 23, 1965, a person who identified himself as, "a pilot on the Logair aircraft" called the aviation weather forecaster at McChord AFB and inquired if VFR flight could be accomplished from McChord AFB to Boeing Field to Hill AFB.

The forecaster briefed the pilot that weather data indicated that over wester Washington the general condition was 4,000 scattered, 25,000 broken cirrus, and

forecast it to remain the same until 1400. Thereafter, clouds at about 9,000 to 10,000 feet would appear, increase and slowly lower during the remainder of the afternoon. East of the Cascade Mountains to Pendleton, Oregon there would be cirrus clouds only with bases at 25,000 feet. The Boise, Idaho area would be clear. To the southeast of Boise the current condition was 3,000 feet scattered, 6,000 to 7,000 feet broken to overcast, increasing to 3,000 feet broken, 6,000 feet overcast in the Malad City, Idaho area, with rain showers and a few thunderstorms over the mountains. Between 1600 and 1800 that area was forecast to become 6,000 feet scattered to broken, tops to 12,000 feet.

The briefer stated that the pilot then advised that in consideration of the foregoing, he would file a VFR flight plan and if necessary would refile en route if southeastern Idaho and Utah did not improve as expected.

The winds aloft forecast was given as McChord AFB to Boeing Field 3,000 feet 200 degrees at 10 knots; Boeing Field to Pendleton 10,000 feet 240 degrees 5 to 10 knots, 15,000 feet, 320 degrees 15 knots; Pendleton to Hill AFB 15,000 feet, 320 degrees 20 knots.

At the time of the briefing the pilot was provided with the then current weather conditions at certain terminals. That information was in part, as follows:

Seattle-Tacoma International Airport.--High thin overcast, visibility 15 miles, temperature 58 degrees, dewpoint 43.

Boeing Field.--High thin overcast, visibility 15 miles, temperature 61 degrees, dewpoint 42.

Pendleton, Oregon.--High thin overcast, visibility 20 miles, temperature 61 degrees, dewpoint 40.

Boise, Idaho.--High overcast, visibility 30 miles, temperature 56 degrees, dewpoint 41.

Burley, Idaho.--Three thousand scattered, estimated 7,000 broken, visibility 30 miles, temperature 53 degrees, dewpoint 43.

Ogden, Utah.--Seven hundred scattered, estimated 1,500 broken, 4,000 overcast, visibility more than 15 miles in light rain.

Aviation weather forecasts for Washington and Oregon are prepared by the U. S. Weather Bureau, Seattle, Washington. The forecast issued at 1045, valid for a 12-hour period beginning at 1100 was in part as follows:

High pressure over Washington and Oregon. Pacific system moving into northern British Columbia coast will cause increasing cloudiness west Washington, northwest Oregon late today. West Washington, west Oregon Mean Sea Level (m.s.l.) 3,500 scattered, 10,000 scattered to broken, top 12,000, 25,000 thin broken. Washington, north Oregon coast occasionally ceiling 3,500 broken.

Slowly increasing clouds from northwest lowering Washington, north Oregon coast to m.s.l. 2,000 scattered, 3,500 broken to overcast, 7,500 overcast occasional light rain, top layers 20,000 after dark.6/

East Washington, east Oregon clear to 25,000 thin broken, scattered cumulus 5,000 above ground level developing early afternoon dissipating during evening, cumulus tops to 12,000- 15,000.

Mountain passes generally open. Columbia River gorge open.

Locally light icing in cumulus. Freezing level northwest Washington 3,500 sloping to 7,000 northeast Washington and to 8,500 south Oregon.

Light to locally moderate turbulence vicinity afternoon cumulus.

The terminal forecasts for Boeing Field and Seattle issued at 0845 for a 12-hour period beginning at 0900 were in part as follows:

0900 - 1800.--Four thousand scattered, 10,000 scattered, 25,000 thin broken.

There is no record of any weather briefing being provided to the crew of Logair 6541C by the personnel of the Seattle FSS following the arrival at Boeing Field.

Reports as to the actual weather conditions which existed in the Seattle and Mt. Rainier areas were provided by witnesses and pilots who observed these conditions on the day of the accident.

One witness, a commercial pilot who conducts a scenic flight service in the Mt. Rainier area testified that the weather was clear during the early morning hours but that by midmorning a cumulus cloud buildup had commenced on the west face of Mt. Rainier. The cloud condition at this time was scattered to broken, with the bases at approximately 4,200 feet and the tops at approximately 8,000 feet m.s.l.

He further stated that the entire mountain was visible above the 8,000-foot level at the time. He related that the cumulus buildup continued in this area and that by noon, an overcast condition prevailed, with the bases about 4,200 feet m.s.l.

An in-flight weather observation was made by a Washington National Guard pilot who conducted a round trip flight between Gray Field, Fort Lewis, just south of Tacoma, Washington, and Yakima, Washington, approximately 90 nautical miles southeast of Seattle. The pilot stated that he departed Gray Field at 1440 for Yakima on an IFR flight plan utilizing Airway V-4. A flight along this airway passes approximately 18 miles to the northeast of the crash site on Mt. Rainier. He testified that a solid cloud deck was entered at approximately 4,700 feet, that a shallow (400 - 500 feet) clear area was encountered between 7,000 - 8,000 feet, with solid cloud conditions to his cruising altitude of 11,000 feet. He further stated that beginning near Tieton Intersection (15 nautical miles northwest of Yakima) he began breaking in and out of the rolling tops of the cloud layer. While on instruments in this layer, he encountered heavy moisture and

6/ After dark refers to all cloud conditions set forth in the paragraph.

rime ice. This condition necessitated the use of propeller alcohol and although it was used, the icing condition was such that they were still getting a buildup of ice on the propeller. Light turbulence was also encountered. This pilot testified that any aircraft flying a route similar to his could not have been VFR unless flying higher than 12,000 feet.

The captain of a West Coast Airlines flight, departing Boeing Field at 1401, four minutes before the departure of Logair 6541C, reported cloud conditions to the east over the Cascades appeared to be layered with slightly darkened cumulus clouds interspersed. This flight was cleared to proceed via V-4 to cruise at 11,000 feet, destination Yakima. The flight reported entering the coulds around 6,000 feet, climbing. At 11,000 feet light icing and turbulence was experienced and a cruising level of 13,000 feet was requested. Since a storm cell was detected on aircraft radar a little south of course, a cruising level of 15,000 feet was requested. The captain stated that the flight broke out of the clouds around 14,000 feet.

1.8 Aids to Navigation

The following aids were available to the flight: The Boeing Field ILS and low frequency beacon (Homer), the Seattle VORTAC (VOR/DME), Olympia VOR, and the Seattle ARTCC radar. Federal Aviation Agency ground certification checks disclosed the facilities were in normal operation. The FAA flight check of the Seattle VORTAC disclosed the facility was operating within prescribed tolerances. The flight check further revealed the accident site was located on the 125-degree radial at 40.2 nautical miles from the facility.

The Seattle ARTCC radar was in use at the time of the accident and was found to be operating satisfactorily. The radar controller testified that at no time during the period that he was in contact with the flight did he observe a radar target which could have been associated with N6541C.

1.9 Communications

Ground certification checks performed by the FAA Systems Maintenance Service technicians revealed all FSS and ARTCC communications equipment was operating within prescribed tolerances. Investigation revealed that at no time during the flight had the crew reported any difficulty concerning communications equipment.

1.10 Aerodrome and Ground Facilities

None of the aerodrome or ground facilities pertinent to the flight were a factor in this accident.

1.11 Flight Recorders

There was no flight recorder installed in this aircraft nor was one required.

1.12 Wreckage

Although the accident occurred between 1423:03 and 1423:18 on April 23, 1965, the wreckage was not located until approximately 1045, April 24. The aircraft had crashed on the west slope of Mt. Rainier, two miles west of the 14,410-foot summit on South Mowich Glacier.

The aircraft struck the glacier at the 10,200-foot elevation where it slopes upward at a 47-degree angle. Initial impact was with the left wing tip on a magnetic heading of approximately 120 degrees and while in an attitude approximating a slightly nose-up, wings-level flight condition. On impact the horizontal convergence angle with the face of the glacier was 60 degrees.

Following the impact at the 10,200-foot level, the major portion of the aircraft slid down the face of the glacier and came to rest on a near-level portion of the glacier at the 9,600-foot elevation.

At the first point of impact, the Nos. 1 and 2 engines and portions of the left wing remained imbedded in the glacier ice. These engines were found in a near-horizontal plane about 30 feet apart.

The rear fuselage broke off at Station 667 just forward of the aft cargo door, which was closed and latched. The empennage separated at approximately Station 1049, but was retained in its relative position by the control cables. Fin and rudder were attached to the tail cone, with minor damage. Tab and rudder hinges were intact and operable. Crew door and overwing exits were in the locked position. The left and right stabilizers separated on impact. The left wing fragmented on impact, the major portion of it remaining at the point of impact. Fragmented portions of the fuselage between stations 231 and 667 were found in a crevasse at the 9,400-foot level. The right inboard wing from station 60 to station 222 broke off and was found inverted close to the fuselage. The No. 3 engine assembly was found close to its attaching position.

The right outboard wing and No. 4 engine from station 222 out to station 421 were found 100 feet south of the fuselage. The landing gear and flaps were in the retracted position. The flap handle on the pedestal was found in the full-up detent. The captain's elevator trim indicator was heavily damaged and showed an 8-degree nose-up setting. The copilot's indicator showed a 2-degree nose-down setting. The aileron trim indicator showed 2 degrees left wing down. The extremities of the aircraft were accounted for and there was no evidence of any in-flight failure. There was no abnormality found in the examination of the flight controls or trim positions. The automatic pilot was found in the "off" position.

The position of the No. 3 propeller governor step motor head disclosed an engine r.p.m. setting of 2410. Normal climb power configuration as used by the carrier is 2400 r.p.m. Inspection of the Nos. 3 and 4 engine assemblies revealed no evidence of any abnormality in the operation of the assemblies or their components. The Nos. 1 and 2 engines were imbedded in an inaccessible and precarious location on the face of the glacier which precluded examination.

The cockpit area was fragmented. The Nos. 1 and 2 VOR receivers were examined and found capable of normal operation prior to impact. No. 1 was tuned to a frequency of 114.5 mcs., and the No. 2 unit was found tuned to 114.6 mcs. The Seattle-Tacoma VORTAC operates on a frequency of 114.5 mcs. Both the No. 1 and No. 2 Omni-bearing dials read 310 degrees. The two VHF transmitters were recovered. No. 1 was found set on 126.2 mcs., and No. 2 was found set on 120.3 mcs.

The distance measuring equipment (DME) was recovered in relatively good condition and was found on a channel setting of 92 and a range measurement of 40.2 miles from the Seattle-Tacoma VORTAC station. This distance of 40.2

miles from the station was the same distance as established during the FAA flight test which was accomplished during the investigation.

Both the pilot's and the copilot's gyrosyn compass indicators were recovered along with both pilot's and copilot's pictorial deviation indicators (PDI). The pilot's compass indicator received substantial impact damage, with the glass and No. 1 pointer missing. The compass card had a heading of 113 degrees. The VOR and ADF pointer selector was set to present VOR readings. The copilot's compass indicator received impact damage which separated the dial and pointer position of the unit. Internal inspection revealed a compass card heading of 114 degrees.

The pilot's PDI received impact damage. However, inspection of the beam coupler control transformer revealed a course setting of 127 degrees. Inspection of the copilot's PDI revealed a course setting of 126 degrees.

1.13 Fire

There was no fire.

1.14 Survival Aspects

All evidence disclosed that this was a nonsurvivable-type accident. Structural deformation and disintegration throughout the occupiable areas of the fuselage precluded the survival of any occupant.

1.15 Tests and Research

The aircraft was being operated on aviation gasoline with an octane rating of 115/145. Following the accident five gallons of fuel from the refueling truck were secured for laboratory testing. Analysis tests of the fuel sample by the Air Force Aerospace Fuels Laboratory at Mukilteo, Washington, reported the fuel as meeting specification requirements and satisfactory for use.

The No. 3 propeller governor, Woodward S/N WH91558, model 5U18-114 Hamilton Standard Head P/N 321908, S/N 502005 was tested at Pacific Propeller, Seattle, Washington, on April 30, 1965. The governor head was positioned at 2410 r.p.m.

2. ANALYSIS AND CONCLUSIONS

2.1 Analysis

There was no structural, powerplant, systems, or navigational component failure that contributed to the cause of this accident. The investigation which included an examination of the aircraft at the crash site on the glacier, and the No. 3 propeller governor setting of 2410 r.p.m. most substantively supports the evaluation that the aircraft was in climb attitude configuration, with climb power settings and capable of normal operation.

The aircraft was currently certificated, airworthy, properly maintained and dispatched in accordance with company operational procedures and Federal Aviation Regulations.

Testimony and investigation disclosed that all ground aids and navigational facilities pertinent to the assistance provided this flight, were operating within prescribed operational limitations.

Weather information provided the crew at McChord AFB supported their evaluation of the briefing, that the flight could be accomplished VFR at least until reaching southeast Idaho, where lowering ceilings were forecast to occur later in the day and if this deteriorating condition existed on reaching southeastern Idaho, the pilot had planned to refile in the air. On the basis of the briefing a VFR flight plan was filed. There is no evidence to indicate that the crew received any further weather information following departure from McChord AFB. At departure from Boeing Field, the official weather observation showed in part, 2,500 scattered, estimated, 12,000 overcast, visibility 15 miles.

However, based on all available weather information, including testimony of inflight and ground witnesses throughout the Seattle area, it is concluded that due to an approaching warm front over the Pacific, cloud conditions lowered relatively rapidly during the early afternoon. It is believed that prior to reaching the accident site the aircraft would have encountered a cloud deck increasing rapidly from scattered to broken to overcast with the base near 5,000 feet, top merging with an overcast whose base was in the 8,000 to 9,000-foot range, tops around 14,000 feet. Under these conditions, it is obvious that the higher elevations of Mt. Rainier would not have been visible to the pilot.

Light to occasionally moderate turbulence was likely to have been encountered en route with light icing in clouds or precipitation above 5,000 feet.

Although the briefing did not include information regarding icing and turbulence it was considered to be adequate. However, the Weather Bureau area forecast which was utilized in the briefing was inaccurate inasmuch as the general conditions encountered by the flight shortly after departure were not forecast to occur until after dark.

With regard to the aircraft's flightpath, there is no way of determining whether the pilot had in some manner incorrectly identified airway V-4 as being the 125-degree radial of the Seattle VOR or had erred with respect to the specific location of Mt. Rainier relative to the 125-degree radial. However, because the aircraft was established on the 125-degree radial directional as well as by position, the PDI's were found set at approximately this radial, and the crew had reported being on V-4 (at 1417), the first possibility is considered the most probable. In either case the lack of proper correlation of the aircraft position with respect to obstructing terrain along its flightpath is apparent.

All communications with the Seattle ARTCC, including the last transmission seconds before impact, were considered to be normal and revealed nothing to suggest any aircraft or flight crew distress.

Although the pilot reported VFR conditions climbing through 10,500 feet, the facts and testimony developed during the investigation most substantively support that instrument flight conditions prevailed during the last portion of the flight, and that the aircraft collided with the mountain while being

operated in instrument flight conditions. It appears obvious to the Board that if in fact the aircraft had been in VFR conditions, the crew could have taken action to avoid collision with the mountain.

2.2 Conclusions

(a) Findings:

1. The aircraft was currently certificated and airworthy.
2. The crew was properly certificated and qualified.
3. The crew had an adequate rest period prior to commencing this flight and on departure appeared normal in all respects.
4. Post-mortem examinations revealed no evidence of any human factor condition that would affect the flight ability of any crewmember.
5. The preflight planning and dispatching were proper.
6. The gross weight and center of gravity were within allowable limits.
7. The flight was normal and routine up to and including takeoff from Boeing field.
8. At no time did the flight report any en route difficulties.
9. The flight was being operated on a VFR flight plan.
10. There was no evidence that the crew was concerned over the safety of their position, or course, or that they initiated any evasive action prior to impact.
11. Based on the fact that the flight's last transmission was at 1423:03 and that it failed to respond to the Seattle ARTCC transmission at 1423:18, it was established that the accident occurred during this period.
12. The accident occurred at an elevation of 10,200 feet on the west slope of Mt. Rainier, 40.2 nautical miles southeast of the Seattle VORTAC on the 125-degree radial.
13. The aircraft's last reported position was accurate in lateral distance from the Seattle VORTAC, and the elevation of the point of impact, 10,200 feet, substantially that as reported en route (10,500) by the crew.
14. The Seattle VORTAC facilities were flight checked subsequent to the accident and found to be satisfactory.
15. The flight departed from its flight-planned route as the result of the crew's mistaken belief that the radial of V-4 Airway (102 degrees) was 125 degrees or they intentionally departed the airway upon encountering instrument flight conditions and were unaware of the specific location of Mt. Rainier relative to the flightpath of the aircraft.
16. The investigation most substantively supports the finding that the crew of Logair 6541C continued on a VFR flight plan into instrument weather conditions which resulted in the aircraft's colliding with a mountain.
17. The aircraft was destroyed.
18. There was no fire.
19. McChord AFB weather briefing for the flight from McChord AFB to Boeing Field to Hill AFB was considered adequate in view of the weather information available to the briefer. However, the Weather Bureau area forecast, which included the Mt. Rainier area and which was utilized in the briefing, was inaccurate in that the weather conditions encountered shortly after takeoff from Boeing Field had not been forecast to occur until after dark.

(b) Probable Cause

The Board determines that the probable cause of this accident was the improper correlation of the aircraft position with respect to obstructing terrain while continuing the flight on a VFR flight plan in instrument weather conditions.

BY THE CIVIL AERONAUTICS BOARD:

/s/ CHARLES S. MURPHY
Chairman

/s/ ROBERT T. MURPHY
Vice Chairman

/s/ G. JOSEPH MINETTI
Member

/s/ WHITNEY GILLILLAND
Member

/s/ JOHN G. ADAMS
Member