Aviation Investigation Final Report

Location:	Spokane, Washington	**Accident Number:**	WPR25LA053
Date & Time:	December 2, 2024, 15:35 Local	**Registration:**	N29GA
Aircraft:	GULFSTREAM AM CORP COMM DIV 690D	**Aircraft Damage:**	Substantial
Defining Event:	Structural icing	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a cross-country flight under an instrument flight rules (IFR) flight plan. The pilot set up for a GPS instrument approach and confirmed all deicing equipment was activated before descending into the clouds for landing. During the descent, the airplane encountered moderate rime icing. Upon exiting the cloud layer, the airplane began to descend below the glide path. The pilot advanced the engine throttles, but both engines were unresponsive. He initiated a forced landing to soft terrain short of the runway threshold, which resulted in a hard landing and subsequent landing gear collapse.

The airplane sustained substantial damage to the fuselage. Postaccident examination of the airplane showed remnants of moderate rime icing on the right and left wing leading edges. Indications of icing remained visible on the propeller spinner, vertical and horizontal surfaces, and two top fuselage antennas. Severe icing was observed on the stall warning vane, which was likely inoperative as a result.

Postaccident examination of the airframe revealed no preaccident mechanical malfunctions or failures that would have precluded normal operation. Control continuity of the power levers and the condition levers for both engines was established from the cockpit controls to both engines. Continuity of the stall warning vane and pitot heat was established from the cockpit switch to the heating elements.

Postaccident examination and test runs of both engines revealed no preaccident mechanical failures or malfunctions that would have precluded normal operation. Both engines were

operated at various power settings and responded to power lever inputs, including rapid power lever increases. Both engines' anti-ice valves were activated from the control room and there was audible actuation of the anti-ice valve solenoids.

A series of airmen's meteorological information bulletins (AIRMETs) was active for the area, primarily for IFR and mountain obscuration conditions. The National Weather Service (NWS) Graphic Forecast for Aviation (GFA) flight categories chart for ceilings and visibility current at the time of the accident depicted an extensive area of Low Instrument Flight Rules (LIFR) conditions over the area due to low ceilings and freezing fog.

When or if the airplane's deicing equipment was activated could not be determined based on the available evidence. The ice accumulation visible on the airplane at the accident site suggested that the ice accumulated to such a degree that it likely caused a loss of engine power to both engines due to ice ingestion.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A partial loss of engine(s) power due ice ingestion.

Findings

Environmental issues	(general) - Effect on equipment

Factual Information

History of Flight

Approach-IFR final approach	Structural icing (Defining event)
Landing	Hard landing
Landing	Landing gear collapse

On December 2, 2024, about 1530 Pacific standard time (all times PST), a Gulfstream AM CORP COMM DIV 690D, N29GA, was substantially damaged when it was involved in an accident near Spokane, Washington. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

During the GPS instrument approach to runway 04L at Felts Field Airport (SFF), Spokane, Washington, the airplane encountered moderate rime icingand a broken ceiling about 300 ft above ground level (agl). The pilot reported that, before entering the clouds, he confirmed that all deicing equipment was activated. The airplane exited the cloud layer about 300 ft agl. The airplane began to descend below the glide path, so the pilot advanced the engine throttles, but both engines were unresponsive. He initiated a forced landing to soft terrain short of the runway threshold. During the landing roll, the landing gear collapsed and the airplane came to rest upright.

According to the Pilot's Operating Handbook, the airplane was certificated for flight in known icing conditions and was equipped with deicing and anti-icing systems. The deice system included deice boots for the empennage and both wings, as well as the propellers. The function of the deicer systems was to eliminate ice after it accumulated. The anti-icing systems were designed to prevent ice accumulation and were to be placed in operation before entering flight conditions conducive to the formation of ice. The anti-icing systems included a heated stall warning, rudder horn anti-icer, rudder tab anti-icer, generator inlet anti-icer, electrically heated windshield, and pitot-static heaters.

ADS-B data showed that the airplane departed the DeLaurentis Airport (OKH), Oak Harbor, Washington, at 1429:10 PST and ascended to 1,625 ft mean sea level (msl) before turning to the east. The airplane continued on an easterly heading and ascended to about 23,600 ft msl. At 1508:10, the airplane began a descent toward SFF. At 1523:01, the airplane made a right descending turn to the southeast and was at an altitude of 5,250 ft msl. At 1527:02, the airplane made a left turn toward the northeast, consistent with the GPS approach to SFF, and was at an altitude of 3,900 ft msl. The last recorded ADS-B target, at 1533:18, showed that the airplane landed about 1,000 ft short of the runway threshold, with an altitude of 1,900 ft msl.

The forecasts issued by the NWS Spokane Weather Forecast Office surrounding the time of the accident were as follows:

At 0933 PST, effective from 1000 PST on December 2 to 1000 PST on December 3, winds will be variable from any direction at 3 kts. Visibility is expected to be > 6 statute miles. The sky will be overcast with a cloud base at 600 ft agl.

Starting at 1400 PST on December 2, winds will remain variable at 3 kts and visibility is expected to remain > 6 statute miles. The overcast cloud layer is expected to rise to 1,000 ft agl.

Starting at 2000 PST on December 2, winds will remain variable at 3 kts, and visibility is expected to remain > 6 statute miles. The overcast cloud layer is expected to drop back to 600 ft agl.

An amended report was issued at 1418 PST, effective from 1400 PST on December 2 to 1000 PST on December 3, indicating winds calm at 0 kts, visibility of 4 statute miles, mist, and broken clouds at 300 ft agl, with an overcast layer at 600 ft agl. Starting at 1500 PST on December 2, a rapid change is expected to occur, with variable wind direction at 3 kts, visibility > 6 statute miles, and overcast clouds at 600 ft agl.

The NWS issued a series of AIRMETs at 1045 PST for the area, primarily for IFR and mountain obscuration conditions.

The NWS GFA flight categories chart for ceilings and visibility current at the time of the accident depicted an extensive area of LIFR conditions over the area due to low ceilings and freezing fog.

The weather observation for SFF at 1553 PST indicated calm wind, visibility of 2 miles in mist, a broken ceiling at 300 ft, overcast at 600 ft, temperature of -1°C, dew point temperature of -1°C, and altimeter of 30.42 inches of mercury. Remarks indicated an automated observation system with a precipitation discriminator, sea-level pressure of 1032.4 hectopascals, temperature of -0.6°C, dew point of -1.1°C, a 6-hour maximum temperature of 0.0°C, a 6-hour minimum temperature of -1.1°C, and 3-hour pressure tendency risen 0.6 hectopascals.

Postaccident site examination revealed that the airplane came to rest upright with the landing gear collapsed underneath the fuselage. The first identified point of contact with the terrain was skid marks about 1,122 ft southwest of where the airplane came to rest. Various locations on both sides of the airplane's fuselage exhibited crushing and bending. Both propeller assemblies were fracture separated from the engines and were located in the debris path.

Remnants of moderate rime icing were observed on the right and left wing leading edges. Indications of icing were also still visible on the propeller spinner, vertical and horizontal surfaces, and two top fuselage antennas. Severe icing was observed on the stall warning vane (figure).

Figure. *View of ice on the stall warning vane. (Source: FAA)*

Examination of the recovered wreckage revealed buckling and crushing damage throughout the fuselage. Recovery personnel had separated both the left and right wings at the wing root to facilitate recovery. Continuity of the stall warning vane heat was established from the cockpit switch to the heating element of the stall warning vane. Power was applied to the wires of the heating element, and the stall warning vane heating element was hot when touched by hand. When power was applied to the airplane the pitot heat on both the left and right pitot tubes activated. Both left and right pitots were hot when touched by hand. Control continuity of the power levers and the condition levers for both engines was established from the cockpit controls to both engines. Both the power control cables and condition lever cables had separations (cuts) near the wing roots and engine nacelles, consistent with cuts by recovery personnel to facilitate recovery.

A visual inspection was conducted of the left and right wing fuel systems with no obstructions identified. Continuity of the remainder of the fuel system from the fuel tanks throughout the system to the engine nacelles was established. Air pressure was applied to the fuel lines for both engine nacelles and fuel was observed draining from both fuel bladders. Power was

applied to the airframe fuel pumps at the wing roots, and the airframe fuel pumps audibly functioned.

A sample of the recovered fuel was tested using a Misco Palm Abbe digital refractometer for anti-icing aviation fuel additive. The reading on the meter was 1.3341, consistent with positive indications of the fuel additive.

Subsequent examination and test running of both engines revealed no preaccident mechanical failures or malfunctions with either engine that would have precluded normal operation. Both engines were operated at various power settings and responded to power lever inputs, including rapid power lever increases. Both engines' anti-ice valves were activated from the control room and there was audible actuation of the anti-ice valve solenoid.

Pilot Information

Certificate:	Commercial; Private	**Age:**	58,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	December 12, 2024
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 14, 2024
Flight Time:	(Estimated) 2755.2 hours (Total, all aircraft), 676.4 hours (Total, this make and model), 2614.1 hours (Pilot In Command, all aircraft), 34.63 hours (Last 90 days, all aircraft), 6.8 hours (Last 30 days, all aircraft), 1.1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GULFSTREAM AM CORP COMM DIV	**Registration:**	N29GA
Model/Series:	690D	**Aircraft Category:**	Airplane
Year of Manufacture:	1983	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	15025
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	September 16, 2024 Annual	**Certified Max Gross Wt.:**	10700 lbs
Time Since Last Inspection:	30 Hrs	**Engines:**	2 Turbo prop
Airframe Total Time:	9080.3 Hrs	**Engine Manufacturer:**	Honeywell Aerospace Technologies
ELT:	C126 installed, not activated	**Engine Model/Series:**	TPE331-10T-513K
Registered Owner:	On file	**Rated Power:**	730 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSFF,1968 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	86°
Lowest Cloud Condition:		**Visibility**	2 miles
Lowest Ceiling:	Broken / 300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.42 inches Hg	**Temperature/Dew Point:**	-1°C / -1°C
Precipitation and Obscuration:	Moderate - None - Mist		
Departure Point:	Oak Harbor,, WA (OKH)	**Type of Flight Plan Filed:**	IFR
Destination:	Spokane, WA	**Type of Clearance:**	IFR
Departure Time:	14:29 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	FELTS FLD SFF	**Runway Surface Type:**	Concrete
Airport Elevation:	1956 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	04L	**IFR Approach:**	RNAV
Runway Length/Width:	4499 ft / 140 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	47.682941,-117.32242

Administrative Information

Investigator In Charge (IIC):	Gutierrez, Eric
Additional Participating Persons:	Todd Prior; FAA; Spokane, WA Blake Harper; Twin Commander; Creedmoor, NC David Studtmann; Honeywell Aerospace Technologies; Phoenix, AZ
Original Publish Date:	December 10, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=199375

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.