



March 6, 2026

In Reply, Refer to: L-175-26-008

Tim Sorensen
Sr. Aviation Accident Investigator
Aviation Safety / Central Region
National Transportation Safety Board
[REDACTED]

**Subject: 2020 Textron Aviation 208B; Serial number: 208B5613; REG: N321BA
Location: Nome, AK; D/A: February 6, 2025
NTSB report number: ANC25MA018**

Dear Mr. Sorensen:

Thank you for the opportunity to review the contents of the NTSB Docket, Textron Aviation has the following comments:

Synopsis

On February 6, 2025, about 1520 Alaska standard time (all times will be AST unless otherwise noted), a Textron Aviation Inc. Cessna 208B, single-engine, turbine-powered airplane, FAA registration number N321BA, operating as Bering Air flight 455, sustained substantial damage when it was involved in an accident near Nome, Alaska. The pilot and nine passengers were fatally injured. The aircraft was operated as a Title 14 Code of Federal Regulations (CFR) Part 135 scheduled commuter flight.

FACTUAL INFORMATION

History of Flight

The flight was operated by Bering Air, Inc. and departed Unalakleet Airport (UNK), Unalakleet, Alaska at 1437 on an instrument flight rules (IFR) flight plan. The accident aircraft was destined for Nome Airport (OME), Nome, Alaska. After departure from Unalakleet, the aircraft turned left on course and started tracking west over the water of Norton Sound toward OME. The aircraft climbed to an altitude of 8,000 ft msl (mean sea level). The descent into OME began about 1511. The last aircraft datapoint was recorded at 15:20:03 while the aircraft was descending through 2,000 ft MSL at a rate of descent of 10,245 fpm, at approximately 38 nm from OME. The aircraft was found on sea ice about 34 miles southeast of OME.

Aircraft Examination

The aircraft came to rest upright on the sea ice. The propeller assembly separated from the engine and was located adjacent to the wreckage. The engine cowling was dislocated and fragmented. The engine remained secured to the mount; however, both the engine assembly and the mount were damaged consistent with impact forces. Contents of the belly pod including pieces of the TKS tank were found 30-40 feet from the tail section of the aircraft, northwest of the main wreckage along with the nose gear and one main wheel. The other main wheel was located about 150 feet to the west-southwest of the main wreckage.

During the post-recovery examination of the aircraft at a storage facility the following icing system related switch positions were documented:

- P/S HEAT/LOW A/S AWARE OFF
- STALL HEAT OFF
- WING LIGHT OFF
- FLUID CONTROL PRIMARY HIGH
- FLUID CONTROL MAX FLOW AIRFRAME
- FLUID CONTROL BACKUP OFF

Meteorological Information

From the Meteorology Specialist's Factual Report:

Nome Airport (PAOM) was the intended destination airport and was equipped with an Automated Surface Observing System (ASOS). The PAOM ASOS was located 32 miles west-northwest of the accident site and issued the following observations surrounding the accident time.

*[1505 AKST] SPECI PAOM 070005Z 00000KT 10SM -SN BKN027
BKN035 OVC055 M10/M12 A3020 RMK AO2 SNB03 P0000
T11001122=*

ACCIDENT TIME 1520 AKST

*[1545 AKST] SPECI PAOM 070045Z 35006KT 4SM HZ FEW009
BKN025 OVC032 M10/M13 A3020 RMK AO2 SNB03E12 P0000
I1000 T11001133=*

The 1500 AKST PAOM sounding indicated a stable layer from near the surface to 6,000 ft with a conditionally unstable atmosphere from 6,000 ft through 7,500 ft. RAOB (Rawinsonde Observation program) indicated cloud cover between 400 ft agl through 8,250 ft and moderate or greater rime and mixed icing conditions between the surface and 8,250 ft.

The 1500 AKST PAOM sounding wind profile indicated a near-surface wind from the west at 5 knots with the wind veering to the southwest by 5,000 ft. The wind speed increased to 10 knots by 5,000 ft with a southwest wind increase to 20 knots by 7,000 ft.

Destination Airport Information

Nome Airport is located two miles west of Nome, Alaska. The airport elevation is 41 ft msl and has two runways: runway 3/21 and 10/28. Runway 3/21 was 6,176 ft long and 150 ft wide. A 4-light visual slope indicator (VASI) was located on the left. Runway 10/28 was 6,009 ft long and 150 ft wide. A 4-light VASI was located on the left; however, on runway 21, the VASI was unusable beyond 2 nm from the threshold due to rapidly rising terrain. Runway 28 had a 1,400 ft medium intensity approach lighting system (MALSR) with runway alignment indicator lights. The airport was not serviced by an ATC tower. Approach service was provided by Anchorage Center and the Nome FSS. A FAA weather camera was located on the field.

Aircraft information

When a 208B aircraft is being operated with a factory installed TKS Ice Protection System, Pilot's Operating Handbook (POH) Supplement 1 must be included in the FAA approved Airplane Flight Manual (AFM). This supplement provides operating limitations, procedures, and training requirements for operation of the aircraft in known or forecast icing conditions. At the time of the accident, revision 5 of the supplement, issued February 2, 2019, was current.

Supplement 1 states that the TKS-Equipped Caravan Cold Weather Ops course is required to be completed within the preceding 12 calendar months for any flight into known or forecast icing conditions.

The aircraft was equipped with a Low Airspeed Awareness system which is discussed in Supplement 1. The system is designed to warn the pilot when airspeed falls below 97.5 +/- 2.2 knots while operating in icing conditions. The system is powered when the P/S HEAT/LOW A/S AWARE switch is in the ON position. According to the AFM TAKEOFF checklist the switch should be in the ON position when the outside air temperature is below 5°C and in visible moisture. The CRUISE checklist also states the switch should be in the ON position when the outside air temperature is below 5°C and in visible moisture. Supplement 1 states that the Low Airspeed Awareness System is required to be installed and fully operational for flight into known or forecast icing conditions.

Supplement 1 lists the following weights regarding aircraft operation:

- Maximum ramp weight 8,842 pounds
- Maximum takeoff weight 8,807 pounds
- Maximum landing weight 8,500 pounds

Supplement 1 provides the following information regarding airspeed and flap settings:

CESSNA
MODEL 208B 867 SHP
GARMIN G1000

SECTION 9 - SUPPLEMENTS
SUPPLEMENT 1

OPERATING LIMITATIONS (Continued)

MINIMUM SPEEDS IN ICING CONDITIONS

The minimum airspeeds for operations in icing conditions with a **FULLY FUNCTIONAL** TKS Ice Protection System operating are:

WING FLAPS UP or TO/APR **95 KIAS**

WARNING

- **These speeds do not apply to takeoff when using the published POH/AFM procedure for TYPE II, TYPE III OR TYPE IV ANTI-ICE FLUID TAKEOFF in Section 4, Normal Procedures of the POH/AFM.**
- **With a failed TKS Ice Protection System, maintain 120 KIAS with WING FLAPS UP (110 KIAS if climbing) and refer to the Emergency Procedure Section of this supplement.**

FLAP SETTING IN ICING CONDITIONS

WING FLAPS must be UP when holding in icing conditions.

WARNING

- **With ice suspected on the airframe, or operating with OAT at 5°C (41°F) or below in visible moisture, do not extend WING FLAPS beyond TO/APR for landing.**
- **WING FLAPS must be extended to TO/APR during all phases of flight (takeoff and landing INCLUDED) when airspeed is below 95 KIAS. This does not apply to takeoff when using the published POH/AFM procedure for TYPE II, TYPE III OR TYPE IV ANTI-ICE FLUID TAKEOFF in Section 4, Normal Procedures of the POH/AFM.**
- **The aural stall warning system does not provide adequate stall warning in all icing conditions.**

FAA APPROVED
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S1-11

Pilot information

The pilot was 34 years old and held a Commercial pilot certificate with a rating for single-engine and multiengine land and Instrument – Airplane, and a type rating on the BE-1900 which included a limitation of SIC privileges only and English Proficient. He held a mechanic certificate with ratings for airframe and powerplant and a remote pilot certificate with a rating for small, unmanned aircraft system. He held an FAA first-class medical certificate dated December 3, 2024, with no limitations. At the time of the accident, he was based at OME. His training records indicated he completed an initial Cessna TKS Caravan Cold Weather Ops online course on September 9, 2023 and completed a recurrent course on October 29, 2024.

ANALYSIS

Aircraft State

Post accident pictures taken at the accident site indicated the aircraft had accumulated approximately $\frac{3}{4}$ of an inch of mixed rime ice on the unprotected surfaces. The TKS ice protection system leading edge surfaces of the wing, struts, horizontal and vertical were noted to be relatively clear ice accumulation. While the P/S HEAT/ LOW A/S AWARE switch was found in the OFF position during the post-recovery examination, the aircraft flight data, discussed below in the Flight Data section, would indicate that this switch was most likely in the ON position during the flight.

The amount of ice accumulation observed in the photos indicated a light to moderate icing encounter during the duration of the flight. The observed ice accumulation on the unprotected surfaces was considered normal and within the allowable maximum ice accumulation established by the manufacturer as stated in the AFM.

The absence of inflight ice accumulation on the TKS protected leading edge surfaces observed in the post-accident photos indicated the ice protection system was operational and properly functioning during the entire flight. In addition, from the time of takeoff to 11 seconds prior to 15:19:35, all aircraft parameters recorded by the Garmin SD card recovered from the aircraft indicated normal flight parameters. This included a period of 20 mins (between 14:51:00 and 15:11:00 in the data) at 8,000 ft altitude where the aircraft maintained a constant airspeed of 150 kts with a power setting of 2,000 ft-lbs. Since the airspeed remained constant, this also provided a positive verification that the TKS ice protection system on the aircraft was operating normally without issue.

Flight Data

The Garmin SD card data recovered from N321BA after the accident flight included several flight parameters such as pitch, roll, airspeed, altitude, engine power settings, fuel levels, and autopilot status. The data did not include AOA as a recorded parameter. However, Textron Aviation was able to calculate an estimated body alpha (waterline angle of attack) and flight path angle values derived from the available flight parameters recorded.

A review of the airspeed information from the Garmin SD card found no abnormalities that would be consistent with a blocked pitot tube or static port. This would be consistent with the P/S HEAT/ LOW A/S AWARE being in the ON position during the flight which would activate the Low Speed Awareness system.

The estimated body alpha was estimated by determining vertical speed, calculated as the difference between change in altitude versus change in time ($\Delta h/\Delta t$) and was then converted from a slope in percent into flight path angle in degrees. An estimated body alpha was then calculated as the difference between aircraft pitch (provided by Garmin SD data) and flight path angle (calculated by Textron Aviation).

For most of the duration of the flight, the flight path angles were within normal flight indications. 11 seconds prior to the autopilot disconnecting, the aircraft flight path angle was approximately zero and body alpha was 6.5 degrees and steadily increased to 8.5 degrees. At 15:19:35 time in the data, the body alpha abruptly increased six degrees from 8.2 to 14.2 degrees. One sec later, airspeed decreased to 99 kts and the autopilot disconnected. This airspeed is within the 97.5 +/- 2.2 kts tolerance of the Low Airspeed Awareness (LAA) system activation and associated stall warning annunciation per the TKS Ice Protection System POH Supplement. As noted in the Garmin Pilot's Guide, the stall warning will cause the autopilot to disconnect. Shortly after the autopilot disconnected, a series of pitch and roll oscillations occurred over the next 6 seconds that further increased the body alpha to 19.0 degrees at an airspeed of 95 kts.

The model 208B airplane lift curve C_L vs AOA (Lift Coefficient vs Angle of Attack) data at flaps up indicates a C_L Max value of 1.54 corresponding to a 16.0 deg AOA at stall. Textron Aviation estimates the aircraft weight at the time of autopilot disconnect to be 9,429 lbs. (NTSB factual report of aircraft's estimated gross weight at takeoff of 9,798 lbs. minus 369 lbs. of fuel burn indicated in Garmin SD card data recovered from the aircraft).

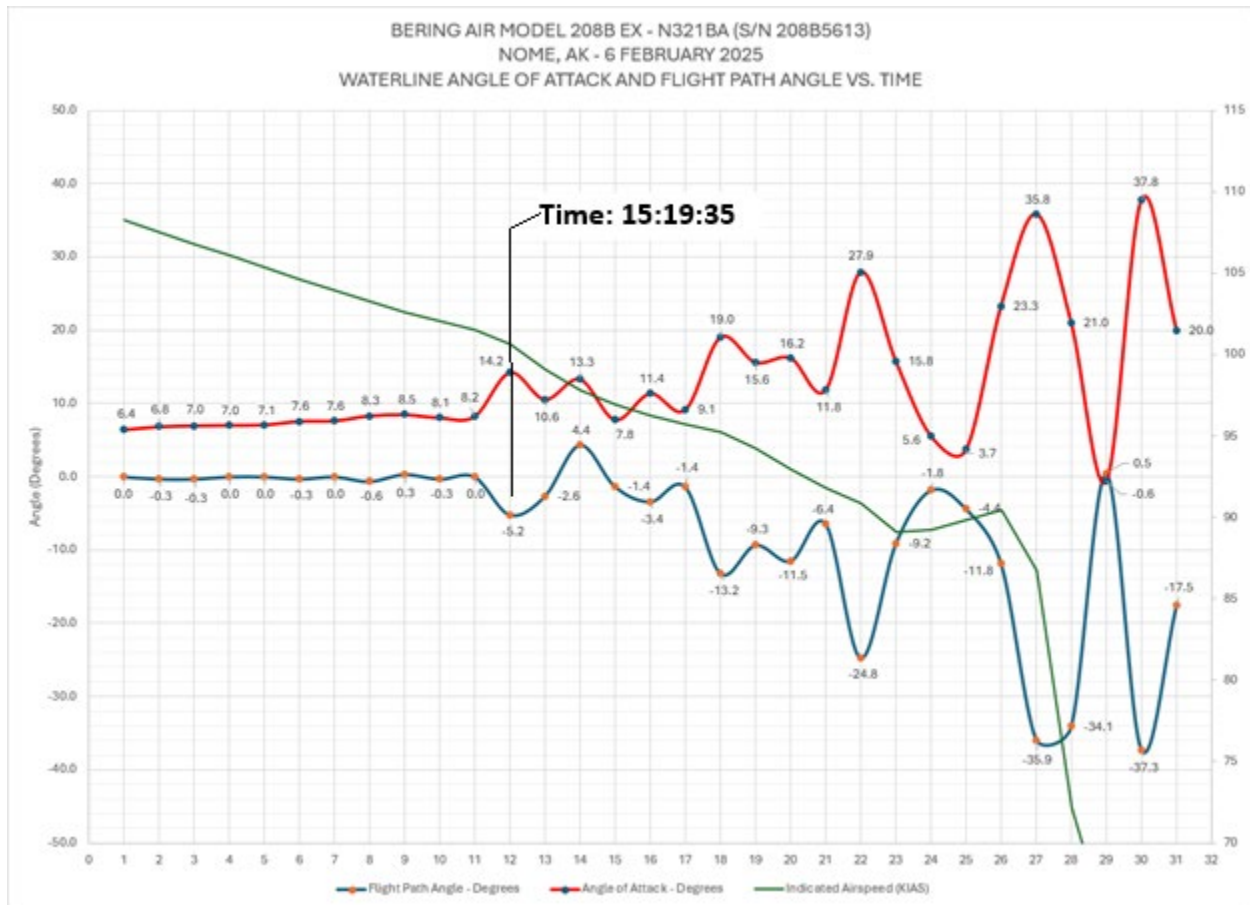
At 9,429 lbs. (622 lbs. over gross weight) the aircraft airspeed decreased below the minimum flight in icing speed of 95 kts established by the manufacturer and published in the POH at maximum takeoff weight of 8,807 lbs. Textron Aviation estimates that at an aircraft weight of 9,429 lbs., the equivalent minimum safe airspeed would be at least 100 kts. At 95 kts and 622 lbs. over the manufacturer's gross weight, the aircraft airspeed was dangerously slow.

The POH has a published flaps up, wings level stall speed of 78 kts at 8,750 lbs. without ice accumulation. This increases to 84 kts in a level, 30° bank turn. Additionally, the TKS Ice Protection System POH Supplement indicates that aircraft performance and stall speed is only slightly degraded with a fully functional and operating TKS ice protection system in icing conditions.

Since N321BA was at a weight of 9,429 lbs. when the autopilot disconnected, the estimated wings level stall speed increase over the data published in the POH would be 81 kts and the estimated level flight 30 deg bank stall speed increase would be 87 kts. Within 11 seconds of the autopilot disconnecting, pitch attitude was 7 deg nose high at a bank angle of 30 degrees and an airspeed of 89 knots. This data and the calculated estimated AOA aligns with both the POH and aircraft data for a clean-wing 208B (Not in icing conditions) and would indicate that the TKS ice protection system was functioning as designed during the flight by preventing ice accumulation on the leading edge protected surfaces and that the icing conditions encountered during the flight had no effect on the performance or stall speed of the aircraft.

It is Textron Aviation's position that the aircraft was inadvertently stalled by the pilot by improperly attempting to level off at the last ATC assigned altitude with a low engine power setting (recorded 1100 ft-lbs. torque vs. 2,397 ft-lbs. available at max rated) and at a relatively high pitch attitude (9 deg pitch). This caused the LAA system to activate the stall warning, which disconnected the autopilot.

Once the autopilot disconnected, excessive flight path and pitch excursions began, likely from pilot induced oscillations of the flight controls. These oscillations rapidly caused the aircraft to further increase AOA and ultimately exceeded the critical AOA which stalled the aircraft and subsequently caused a departure from controlled flight.



CONCLUSIONS

Textron Aviation believes that the evidence supports the following conclusions:

- The pilot was properly certified to operate the aircraft
- The pilot had completed the required aircraft cold weather operations training within the 12 months preceding the accident.
- The operator loaded the aircraft in a configuration which significantly exceeded the maximum takeoff weight limitations for a flight into known or forecast icing conditions per POH Supplement 1 of 8,807 lbs.
- The pilot failed to operate the aircraft in accordance with procedures established in the AFM.
- The pilot failed to follow company policy on minimum airspeeds and autopilot usage while in operating icing conditions.
- The pilot allowed the airspeed to decrease below the minimum speed in icing conditions of 95 knots published in the AFM.

- The pilot did not lower the flaps to TO/APR as instructed in the AFM when operating below 95 knots in icing conditions.
- The pilot did not execute a satisfactory imminent stall recovery and allowed the aircraft to enter into an aerodynamic stall which resulted in loss of control.

PROBABLE CAUSE

Based on an analysis of the information obtained during the investigation, the following probable cause is put forth:

The pilot failed to maintain sufficient airspeed which resulted in the autopilot to automatically disconnect at a low airspeed, high AOA condition and the pilot inadequately responded to the imminent stall by inducing excessive pitch oscillations in the flight controls that caused the aircraft to further decrease airspeed and increase AOA which resulted in an aerodynamic stall and subsequently departed controlled flight.

Contributing to the accident was the aircraft weight at the time of the stall exceeded the maximum allowable gross weight for takeoff by 622 lbs.

If further assistance is required, please contact me or another member of our Air Safety Investigations Department.

Sincerely,

TEXTRON AVIATION



Ernest C. Hall
Senior Air Safety Investigator
Textron Aviation Air Safety Investigations