

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA24LA094

OPERATIONAL FACTORS

Specialist's Factual Report

April 3, 2024

TABLE OF CONTENTS

A. INCIDENT	4
B. OPERATIONAL FACTORS SPECIALISTS	4
C. SUMMARY	4
D. DETAILS OF THE INVESTIGATION	5
1.0 OPERATIONAL FACTORS SPECIALIST ACTIVITIES	5
1.1 January 21, 2024.....	5
1.2 January 23, 2024.....	5
1.3 January 24-25, 2024.....	5
1.4 January 26, 2024.....	5
1.5 February 5, 2024.....	5
2.0 HISTORY OF FLIGHT	6
3.0 PILOT INFORMATION	8
3.1 PIC Information	8
3.1.1 PIC Certification Records.....	8
3.2 SIC Information	9
3.2.1 SIC Pilot's Certification Records.....	9
4.0 AIRCRAFT INFORMATION	10
4.1 Weight and Balance	11
5.0 SOUTHERN AIRWAYS EXPRESS WINTER OPERATIONS GUIDANCE AND TRAINING MATERIAL.....	11
5.1 Icing Conditions.....	11
5.2 Operations During Ground Icing Conditions (GIC)	11
5.2.1 Operations During Ground Icing Conditions	11
5.2.2 Pre-takeoff Contamination Inspection C-208.....	11
5.3 Southern Airways Express Winter Operations Bulletin	12
5.4 From the PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL CESSNA MODEL 208B (675 SHP):	13
5.4.1 VISUAL AND TACTILE CHECK.....	13
6.0 FROM THE PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL CESSNA MODEL 208B (675 SHP).....	13
E. ATTACHMENTS.....	14

ATTACHMENT 1 - PILOT INTERVIEWS	14
ATTACHMENT 2 - ADS-B DATA FROM ADS-B EXCHANGE	14
ATTACHMENT 3 - SOUTHERN AIRWAYS EXPRESS SOP PAGE 2-41	14
ATTACHMENT 4 - SOUTHERN AIRWAYS EXPRESS FOM PAGES 7D-21, 7D-22	14
ATTACHMENT 5 - 2023 SOUTHERN AIRWAYS EXPRESS WINTER OPERATIONS BULLETIN	14
ATTACHMENT 6 - PILOT OPERATING HANDBOOK REVISION 23 4 MAY 2007 EXCERPTS	14
ATTACHMENT 7 - WEIGHT AND BALANCE	14

A. INCIDENT

Location: Dulles, Virginia
Date: January 19, 2024
Time: 1245 Eastern Standard Time (EST)
1745 Universal Coordinated Time (UTC) ¹
Airplane: N1983X, Cessna 208B; Southern Airways Express Flight 246 (FDY246)

B. OPERATIONAL FACTORS SPECIALISTS

Specialist Rocky Stone
National Transportation Safety Board
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C. SUMMARY

On January 19, 2024, about 1247 eastern standard time, a Cessna 208B, N1983X, was involved in an incident at Dulles, Virginia. The commercial pilot, commercial copilot, and five passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 135 scheduled, commuter air carrier passenger flight.

The operator, Southern Airways Express, reported the following. Flight 246 from Washington Dulles International Airport (IAD), Dulles, Virginia to Lancaster Airport (LNS), Lancaster, Pennsylvania, departed from runway 30. During the initial climb after takeoff, about 600 ft above ground level (agl), the flight crew noticed that the standby power light in the cockpit illuminated. Shortly thereafter, there was a sudden, chattering noise and vibrations coming from the engine area.

The pilot, who was at the controls, instructed the copilot to declare an emergency and initiate procedures to return to IAD. During the turnback, it became evident that the engine was unresponsive and the airplane was rapidly losing altitude. The pilot made the decision to land the airplane on highway 606, near the perimeter of IAD. During the landing, the airplane touched down on the paved surface of the road and collided with a steel guardrail before coming to a stop. The flight crew secured the airplane and the crew and passengers were met by first responders.

¹ All times within this report are EST unless otherwise noted. At the time of the incident UTC time was EST + 5 hours.

Inspectors with the Federal Aviation Administration (FAA) responded to the incident site and examined the airplane. Damage was noted to the highway guardrail, propeller, right main landing gear, cargo pod, and fairing. The airplane was towed to a nearby parking lot and secured. Subsequently, the wings were disassembled and the airplane was transported to the Southern Airways Express maintenance facility at LNS.

The airplane was retained for further examination.

D. DETAILS OF THE INVESTIGATION

1.0 Operational Factors Specialist Activities

1.1 January 21, 2024

The Operational Factors Specialist were assigned to the investigation and began collecting pilot information from the Southern Airways Express and the FAA.

1.2 January 23, 2024

The Operational Factors specialist requested and received pilot training documentation from FlightSafety International, and duty and flight history from Southern Airways Express.

1.3 January 24-25, 2024

On Wednesday, January 24, 2024, the Operational Factors Specialists along with a Meteorology Specialist interviewed the Pilot in Command (PIC) of FDY246. On Thursday, January 25, 2024, the Second in Command (SIC)² was interviewed by the specialists. The interviews were recorded and transcribed and are located in the docket associated with this accident.

1.4 January 26, 2024

Received PIC and SIC flight training records from FlightSafety International.

1.5 February 5, 2024

Received PIC and SIC flight history from Southern Airways Express, consisting of flight time while at Southern Airways Express. Also received Southern Airways Express documentation on winter operations and deicing procedures.

² SIC is also referred to as "co-pilot"

2.0 History of Flight

The accident flight was the second flight of the day for the pilots³, as they flew the airplane into IAD from DUB about an hour prior to the incident. The PIC stated "When I check the airplane, it was no ice, snow... the airplane when I checked it, so I decided not to do deice."⁴ The SIC stated "It started snowing basically right about the time that we did our startup. And it may have been snowing lightly before that, but I really didn't notice the snow until we were actually on startup."⁵ The aircraft began taxiing shortly before 12:40. The first Automatic Dependent Surveillance - Broadcast (ADS-B) data point shows 16 knots of ground speed⁶.

During an interview, the SIC stated that prior to entering the runway, "We do a contamination check and that includes looking out the wing, at the actual wing. And again, there was no accumulation or anything. It was just wet."⁷ As the power was pushed up for takeoff, the SIC reported "So I'll run my finger literally across the top looking at everything and making sure that everything is in the green and it was. Everything was in the green."⁸

All proceeded normally until about 400 ft agl when the SIC reported "So, right about 700 feet, we started to develop ... a vibration and I can't describe vibration other than there was a -- it's like a flat tire vibration. The whole engine started to vibrate."⁹ A turn was initiated and the SIC stated "And he started a left-hand turn and established the turn and we knew when we started that turn, there was -- we were not going to make it back to the runway."¹⁰

After the realization that they couldn't make it back to the field the SIC states "...we both looked ahead, and in front of us was a road and there was traffic that was stopped at one signal, a big break in the cars, and then cars that were further up. And we both looked at each other, and we said that's where we have to go."¹¹

The PIC landed the aircraft and due to a slight turn in the road, the airplane contacted the right guard rail during the landing roll-out, causing minor damage. After communicating with tower regarding their position and the disposition of their passengers, the pilots and passengers egressed the aircraft.

³ Pilot Interviews, Attachment 1, page 10, lines 13-15

⁴ Pilot Interviews, Attachment 1, page 14, lines 3-5

⁵ Pilot Interviews, Attachment 1, page 86, lines 15-18

⁶ ADS-B data, Attachment 2, first data point

⁷ Pilot Interviews, Attachment 1, page 86, lines 24-25

⁸ Pilot Interviews, Attachment 1, page 90, lines 13-16

⁹ Pilot Interviews, Attachment 1, page 91, lines 11-14

¹⁰ Pilot Interviews, Attachment 1, page 91, lines 23-25

¹¹ Pilot Interviews, Attachment 1, page 92, lines 5-8

The data in this section was from ADS-B data obtained from ADS-B Exchange, which included groundspeed and uncorrected pressure altitude. Airspeed data was unavailable as the airplane was not equipped, nor required to be, with a flight data recorder. All altitudes are uncorrected pressure altitude and speeds are ground speed from ADS-B data. The incident aircraft began taxiing on the terminal ramp for takeoff about 1239. Takeoff roll commenced at 1244:30. The aircraft became airborne at 1245:06. At 1246:09 the aircraft reached barometric altitude of 900 ft and a speed of 94 kts. At 1246:38 the aircraft continued to climb to 1,100 ft but decelerated to a speed of 72 kts. About 12 seconds later the aircraft indicated at 1,100 ft but had decelerated to 40 kts. Eight seconds later the aircraft had descended to 900 ft and indicated 91 kts. At 1247:14, about 30 seconds after the initial vibration, the aircraft landed on a roadway and subsequently came to a stop on the shoulder. See attachment 2 for complete ADS-B data.



Figure 1: Profile view of the accident ground track: (Source: adsbexchange.com)

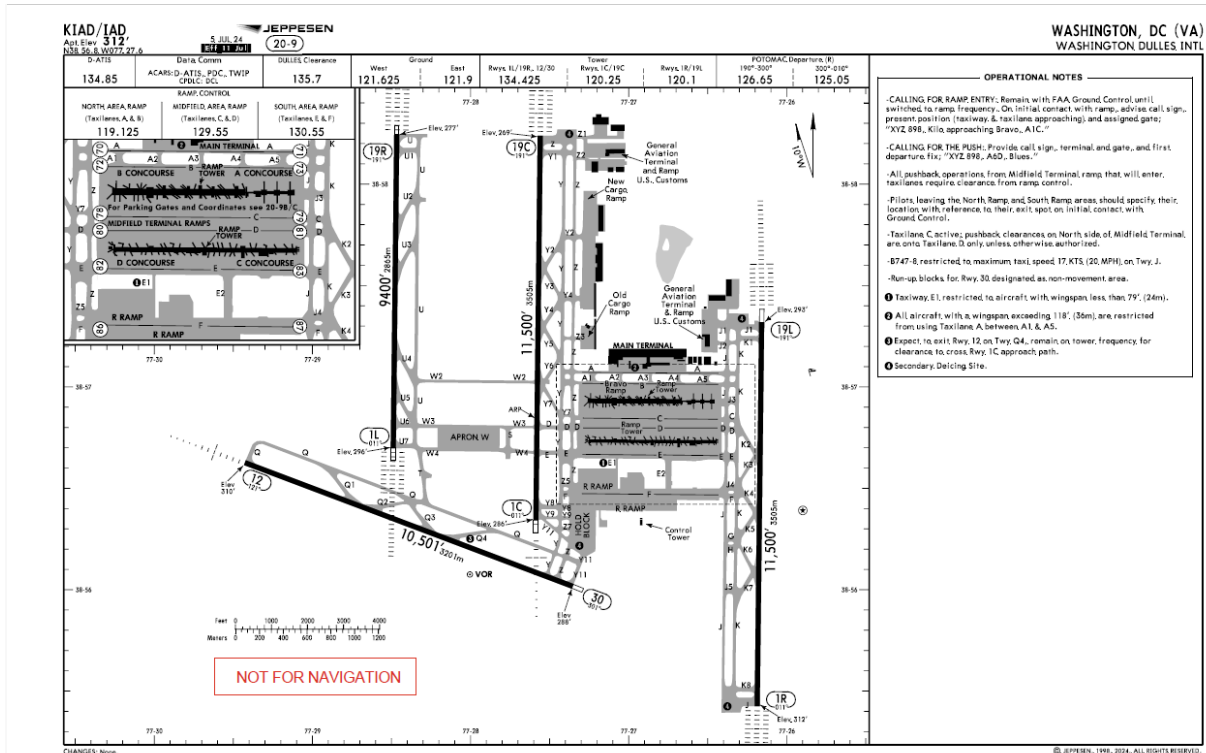


Figure 3: Washington Dulles Airport layout (Source: Jeppesen)

3.0 Pilot Information

The crew consisted of a PIC, and SIC. There were five passengers on board.

3.1 PIC Information

The PIC held a Commercial Pilot Certificate with Instrument Airplane, Airplane Single and Multiengine Land Ratings, English Proficient. He held a FAA first-class medical certificate dated August 24, 2023, with a limitation of "must use corrective lens(es) to meet vision standards at all required distances."

At the time of the mishap the PIC was current in the C208 and had accumulated 287.3 hours of pilot in command flight time in type. His total flight time was approximately 1,580 hours, with 570 hours in the C208.¹²

3.1.1 PIC Certification Records

FAA records of the pilot indicated the following:

¹² Attachment 1 - ERA24LA094 Interviews page 7 lines 17-19

Private Pilot (Foreign Based) certificate Airplane Single Engine Land (Limitations): English Proficient: Issued on basis of and valid only when accompanied by Pakistan Pilot License; All limitations and restrictions on the Pakistan pilot license apply. The certificate was issued on August 8, 2022.¹³

Private Pilot (Foreign Based) with Instrument Rating certificate was issued on October 10, 2022.

Notice of Disapproval - Private Pilot Instrument Rating was issued on October 21, 2022. Unsatisfactory items: Navigation Systems: A. Intercepting and tracking navigational systems and arcs.

Commercial Pilot Instrument Airplane; Airplane Single-Engine Land; (Limitations): English Proficient certificate was issued on December 30, 2022.

Commercial Pilot Instrument Airplane; Airplane Single Engine Land; Airplane Multi Engine Land (Limitations); English Proficient certificate was issued on January 25, 2023.

3.2 SIC Information

The SIC held a Commercial Pilot Certificate with an Instrument Airplane, Airplane Single and Multiengine Land Ratings, English Proficient. She held a FAA first-class medical certificate dated June 26, 2023, with no limitations.

The SIC had approximately 830 hours total time with 220 hours in the C208.¹⁴

3.2.1 SIC Pilot's Certification Records

FAA records of the SIC indicated the following:

Private Pilot - Airplane Single Engine Land certificate was issued on August 27, 1990.

Notice of Disapproval - Private Pilot Instrument Rating was issued on November 16, 1990. Unsatisfactory items: Pilot Operations 2, 3, and 5. Not Complete 2, and 3. (First Failure)

Private Pilot - Airplane Single Engine Land, Instrument Airplane certificate was issued on November 28, 1990.

¹³ Commercial Pilot - License with Instrument Rating was issued by the Pakistan Civil Aviation Authority September 19, 2016.

¹⁴ Attachment 1 - ERA24LA094 Interviews page 75 lines 12-15

Private Pilot – Airplane Single Engine Land, Instrument Airplane; Airplane Multi Engine Land Valid for Visual Flight Rules (VFR) Only certificate was issued on January 10, 1991.

Commercial Pilot – Airplane Single Engine and Multiengine Land, Instrument Airplane certificate was issued on March 25, 1991.

Notice of Disapproval – Certified Flight Instructor Instrument was issued May 22, 1991.
Unsatisfactory items: Oral, VOR & NDB intercepts (First Failure)

Flight Instructor; Instrument Airplane; was issued June 1, 1991.

Flight Instructor: Airplane Single and Multiengine, Instrument Airplane certificate was issued August 27, 1991. Reissued: August 22, 1993; August 20, 1995; July 27, 1997; July 25, 1999; August 20, 2001; August 25, 2003; August 30, 2005; August 28, 2007; August 28, 2009; August 25, 2011; August 23, 2013; August 24, 2015; August 15, 2017; August 22, 2019; August 29, 2021; August 14, 2023.

4.0 Aircraft Information



Figure 2: Picture of the accident aircraft, N1983X (Source: jetphotos.net)

4.1 Weight and Balance

See Attachment 7 for Weight and Balance information for this flight.

5.0 Southern Airways Express Winter Operations Guidance and Training Material

5.1 Icing Conditions

Southern Airways Express (SAE) Standard Operating Procedures (SOP)¹⁵ defined icing procedures as:

1. Visible moisture (clouds, rain, snow, ice crystals); and,
2. An OAT of 5 degrees C or less.

5.2 Operations During Ground Icing Conditions (GIC)

The SAE Flight Operations Manual provided, in part, the following guidance as it pertained to operations in GIC:

5.2.1 Operations During Ground Icing Conditions¹⁶

Even small amounts of snow, ice or frost contamination may cause a potentially dangerous degradation of aircraft performance and unexpected flight characteristics. All Southern Airways pilots must use the methods outlined in this manual to ensure that no aircraft will takeoff with ice, frost or snow adhering to any surface.

Ground Icing Conditions exist when:

1. Frost, ice, or snow is adhering to or may adhere to the critical surfaces of an aircraft.
2. Ground Icing Conditions also exist when active frost, frozen or freezing precipitation is reported or observed.

5.2.2 Pre-takeoff Contamination Inspection C-208

This inspection is specific to the C-208 Caravan operated by Southern Airways. Whenever ground icing conditions are in effect, a pre-takeoff contamination check must be accomplished to ensure the aircraft is free of frost, ice or snow on the following surfaces:

1. Windshield
2. Empennage
3. Stabilizing or control surfaces
4. Wing
5. Pitot Static Tubes

¹⁵ Attachment 3 - Southern Airways Express SOP Page 2-41

¹⁶ Attachment 5 - 2023 Southern Airways Express Winter Operations Bulletin, pages 9-10

6. Propeller
7. Engine Inlet

This must occur during the normal preflight walk-around inspection. If any contamination is discovered during the preflight inspections; the PIC must ensure the contamination is properly removed. This check must be accomplished within 5 minutes prior to beginning the takeoff run.

The Pilot in Command is responsible for the following:

1. Ensuring the aircraft is clean of frost, ice or snow "contamination" prior to takeoff.
2. Complying with the pre-takeoff contamination check.
3. Advising the Company as early as possible that there may be a need to remove the contamination.
4. Advising the Director of Operations of any changes that will improve the procedure.

The Pilot in Command or SIC, if assigned, will accomplish a visual inspection of the wings and horizontal stabilizer 5 minutes prior to takeoff for contamination whenever active icing is occurring. If the SIC is assigned, the PIC remains responsible for ensuring the process is properly completed. The following procedure will be used to accomplish this inspection from outside the aircraft:

1. The Captain will visually inspect both wings (Outboard of the fuselage) and the Pitot Static Tubes.
2. The Captain will visually inspect both horizontal stabilizers from the open cockpit door.
3. The propeller and engine inlet must be checked from the front of the aircraft with the engine shut down.
4. If at night, the Captain will use a flashlight to inspect required components and surfaces.
5. If the aircraft is not airborne within 5 minutes of the last pre-takeoff contamination check, the above procedure must be repeated.
6. If at any point the Captain is unsure if the wing is clear of contamination, the Captain will perform a tactile check of the wings and control surfaces.
7. If the wing and horizontal stabilizer are contaminated the aircraft will return to gate/hangar and the contamination will be removed.
8. Accepted means for de-icing the aircraft are Type-1 de-ice fluid, heated forced air, placing the aircraft in a heated hangar and use of a soft brush or broom designated specifically for de-icing. Holdover times may not be used when using Type 1 fluid for the purpose of deicing.

5.3 Southern Airways Express Winter Operations Bulletin¹⁷

NOTE:

¹⁷ Attachment 5 - 2023 Southern Airways Express Winter Operations Bulletin

The engine intake must be clear of all ice/snow and debris prior to engine start. Do not use glycol to clear the engine intake. Intake may be cleared mechanically or by using forced hot air.

5.4 From the PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL CESSNA MODEL 208B (675 SHP)¹⁸:

5.4.1 VISUAL AND TACTILE CHECK

If the OAT is below 10°C (50°F) a tactile check of the wing leading edge and upper surface per Section 4 of the Pilot Operating Handbook (POH) is required in addition to a visual inspection. During ground icing conditions, takeoff must be accomplished within 5 minutes of completing the tactile inspection unless the airplane is operated per FAR 135.227(b)(3).

Ground icing conditions are defined as:

1. The Outside Air Temperature (OAT) is 2°C (36°F) or below and visible moisture is present (i.e. rain, drizzle, sleet, snow, fog, water is present on the wing, etc.), or,
2. The OAT is 5°C (40°F) or below and conditions are conducive to active frost formation (e.g. clear night with a dew point temperature/OAT difference of 3°C (5°F) or less). Takeoff is prohibited if frost, ice or snow may reasonably be expected to adhere to the airplane between the tactile check and takeoff (e.g. snow near freezing temperature with no deicing/anti-ice fluid application).

6.0 From the PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL CESSNA MODEL 208B (675 SHP)¹⁹

STALL SPEEDS

Conditions:

Power Lever - Idle

Fuel Condition Lever -

High Idle Weight - 8750 Lbs

NOTE

¹⁸ Attachment 6 - Cessna 208 POH excerpts, Page 2-12

¹⁹ Attachment 6 - Cessna 208 POH excerpts, Page 5-18

- Altitude loss during a stall recovery may be as much as 300 feet from a wings-level stall and even greater from a turning stall.
- Knots Indicated Airspeed (KIAS) values are approximate.

MOST REARWARD CENTER OF GRAVITY

8750 Pounds:

FLAP SETTING	ANGLE OF BANK							
	0°		30°		45°		60°	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	63	78	68	84	75	93	89	110
10°	58	69	62	74	69	82	82	98
20°	53	63	57	68	63	75	75	89
30°	48	60	52	64	57	71	68	85

MOST FORWARD CENTER OF GRAVITY

8750 Pounds:

FLAP SETTING	ANGLE OF BANK							
	0°		30°		45°		60°	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
UP	63	78	68	84	75	93	89	110
10°	60	70	64	75	71	83	85	99
20°	54	64	58	69	64	76	76	91
30°	50	61	54	66	59	73	71	86

E. ATTACHMENTS

Attachment 1 - Pilot Interviews

Attachment 2 - ADS-B data from ADS-B Exchange

Attachment 3 - Southern Airways Express SOP Page 2-41

Attachment 4 - Southern Airways Express FOM pages 7D-21, 7D-22

Attachment 5 - 2023 Southern Airways Express Winter Operations Bulletin

Attachment 6 - Pilot Operating Handbook Revision 23 4 MAY 2007 excerpts

Attachment 7 - Weight and Balance

Submitted by:

Rocky Stone

Aircraft Accident Investigator, Operational Factors