

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA24FA209

STRUCTURES

Group Chair's Factual Report

March 7, 2025

TABLE OF CONTENTS

A	ACCIDENT.....	3
B	STRUCTURES GROUP.....	3
C	DETAILS OF THE INVESTIGATION	3
D	FACTUAL INFORMATION.....	3
1.0	AIRPLANE INFORMATION	3
2.0	ACCIDENT SITE	4
3.0	AIRPLANE EXAMINATION	5
3.1	Right Wing	5
3.2	Left Wing.....	7
3.3	Right Horizontal Stabilizer.....	8
3.4	Left Horizontal Stabilizer	9
3.5	Vertical Stabilizer.....	10
4.0	MAINTENANCE RECORDS	11

A ACCIDENT

Location: Palmyra, Virginia
Date: May 5, 2024
Time: 0854 Eastern Standard Time
1254 Coordinated Universal Time (UTC) May 5, 2024
Airplane: Rockwell International 690A, N690BM

B STRUCTURES GROUP

Group Chair Leani Benitez-Cardona
National Transportation Safety Board
Washington, DC

Group Member Clinton R. Crookshanks
National Transportation Safety Board
Aurora, Colorado

C DETAILS OF THE INVESTIGATION

The group examined the accident airplane from June 4-5, 2024, at AMF Aviation located in Springfield, TN. The accident occurred on May 5, 2024, about 0854 eastern daylight time. The Rockwell International 690A, N690BM, was destroyed when it was involved in an accident near Palmyra, Virginia. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

D FACTUAL INFORMATION

1.0 Airplane Information

The Rockwell International 690A airplane is a twin turboprop airplane (Figure 1) originally certified in 1973. The airplane is equipped with a conventional tail and retractable tricycle landing gear. The airplane is 42 feet, 11.72 inches long, 14 feet, 11.35 inches tall at the tail, has a fuselage diameter of 5 feet, 7 inches, has a wingspan of 52 feet, 1.47 inches, and has a horizontal stabilizer span of 19 feet, 9.36 inches. The airplane primary and secondary wing, fuselage, and tail structure are of all metal construction, primarily aluminum alloys. The accident airplane, N690BM, was acquired by Commander 690 BM LLC in August 2014.

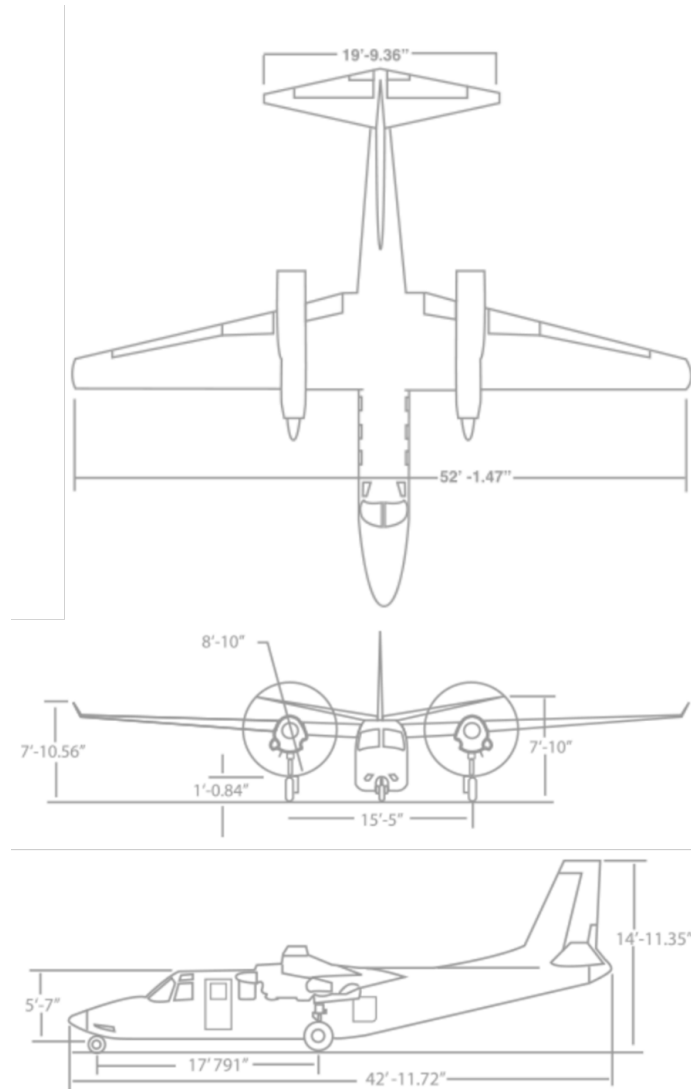


Figure 1. Rockwell International 690A 3-view drawing (Source: Ontic)

2.0 Accident Site

The airplane was found in the woods near Palmyra, VA and several components of the airplane were found scattered through the terrain. Farthest from the main wreckage were sheet metal pieces, followed by the right horizontal stabilizer, the vertical stabilizer, and the left horizontal stabilizer and then the right wing.

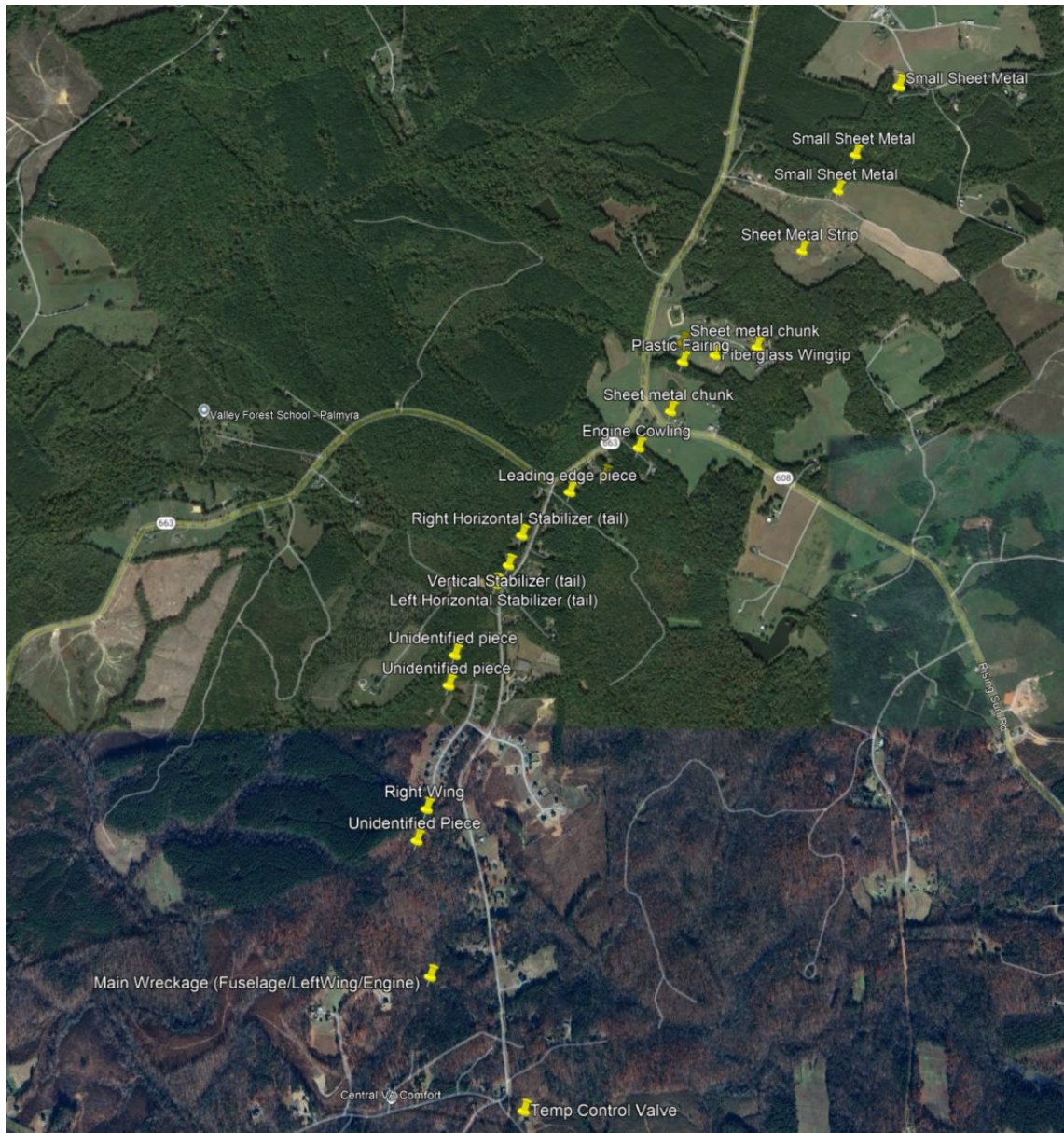


Figure 2. Wreckage Debris Map (NTSB image)

3.0 Airplane Examination

3.1 Right Wing

The right wing was found separated from the main wreckage laying upside down on the ground. The right aileron and the right engine separated from the wing and were not recovered.

The entire lower skin showed evidence of heat damage with areas of skin penetration (Figure 3). The lower surface inboard of the engine was burnt through the skin into the frame structure which was burnt and melted. The areas of the upper

skin that were observed exhibited minor heat damage to the paint. The right wing structure was deformed in a downward direction between the fracture at the root and the nacelle. The fractured surfaces were visually inspected, and they had a dull, grainy appearance consistent with overstress fractures.



Figure 3. Right Wing Damage (aft looking forward at lower surface) (NTSB photo)

The leading edge of the right wing had a cut approximately 50 inches from the outboard edge of the nacelle (Figure 4). The cut was through the leading edge and extended approximately 2 inches aft on the lower skin and 4 inches aft on the upper skin. The leading edge skin was deformed upward on the upper and lower surfaces.



Figure 4. Right Wing Damage (forward looking aft) (NTSB Photo)

The inboard mount block remained attached to the wing and did not show signs of deformation (this section was cut during recovery operations). The outboard mount fractured and deformed in the outboard direction (Figure 5).



Figure 5. Right Engine Mounts (NTSB Photo)

3.2 Left Wing

The left wing and engine remained attached to the fuselage laying upside down on the ground. The left aileron was separated from the wing and was not recovered. The left wing was cut from the fuselage and sectioned in two parts during recovery.

The entire lower skin showed evidence of heat damage with areas of skin penetration (Figure 6). The lower surface of the left wing inboard of the engine was burnt though and the frame structure melted. The areas of the upper skin that could be observed exhibited minor heat damage to the paint. The left wing had a deformation in the downward direction near the wing root.



Figure 6. Left Wing Damage (lower surface) inboard (left) outboard (right) (NTSB Photo)

3.3 Right Horizontal Stabilizer

The right horizontal stabilizer separated from the airplane and was recovered in the debris field in three major pieces with no heat or fire damage (Figure 7). The right elevator was not recovered. The first piece consisted of the right horizontal stabilizer forward spar, leading edge, the center spar, and most of the upper and lower skins from the root to about 80 inches outboard. The forward spar was completely fractured about 80 inches outboard of the root. The forward spar was partially fractured about 48 inches outboard of the root and the forward spar, leading edge and portions of the upper and lower skins were twisted about 180° leading edge down between 48 and 80 inches outboard of the root. There was an aluminum access door on the upper skin, approximately 43 inches from the wingtip (between stations 70 and 78). There were weights attached to the forward spar at this location. The second piece consisted of the right horizontal stabilizer aft spar, portions of the center spar, and the upper and lower skins from about 5 inches inboard of the root to about 80 inches outboard of the root. The third piece consisted of the outboard end of the right horizontal stabilizer that spanned from about 80 inches outboard of the root to the tip. The third piece was mostly intact with little damage. The fractured surfaces were visually inspected, and they had a dull, grainy appearance consistent with overstress fractures.

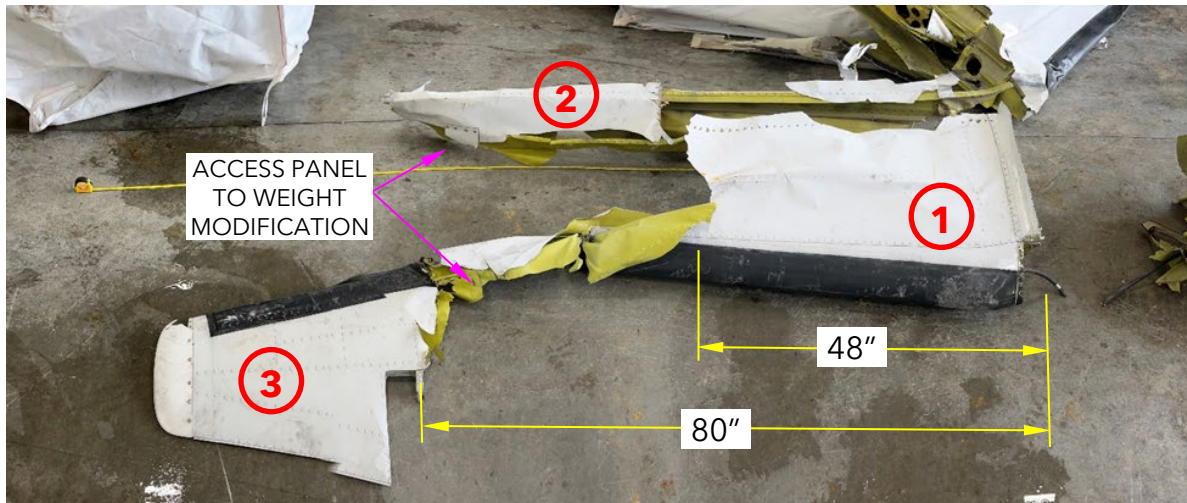


Figure 7. Right Stabilizer (NTSB Photo)

3.4 Left Horizontal Stabilizer

The left horizontal stabilizer separated from the airplane in two major pieces with no heat or fire damage (Figure 8). The elevator and most of the aft and center spars separated from the rest of the stabilizer and were not recovered. The first piece comprised the left horizontal stabilizer forward spar, leading edge and most of the upper and lower skins from the root to about 50 inches outboard. The forward spar was fractured approximately 50 inches from the root. The second piece comprised the outboard section of the left stabilizer from about 50 inches outboard of the root to the tip with little damage to the outboard end. The aft spar was fractured approximately 45 inches from the tip and the center spar was fractured approximately 39 inches from the tip. The forward spar and leading edge were deformed at the fracture location consistent with the elevator tip moving upwards and slightly leading edge up (Figure 9). There was an aluminum access door on the upper skin, approximately 43 inches from the wingtip, between stations 70 and 78. There were weights attached to the forward spar at this location. The fractured surfaces were visually inspected, and they had a dull, grainy appearance consistent with overstress fractures.

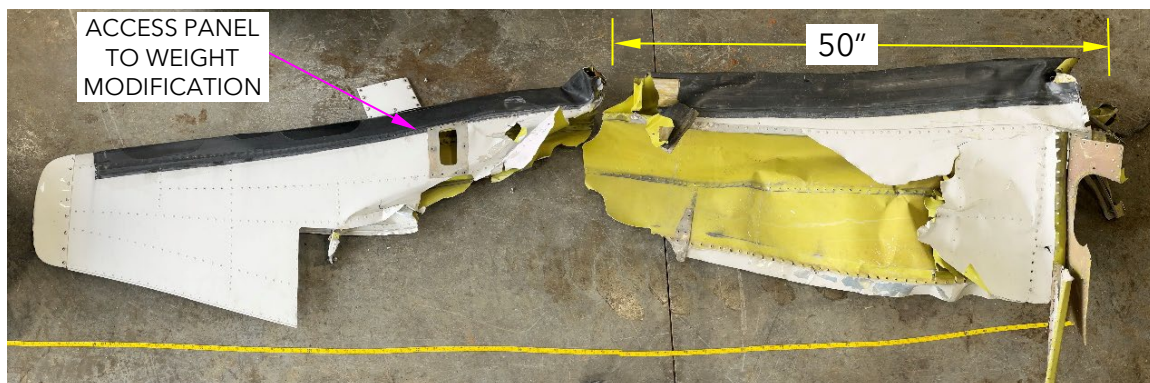


Figure 8. Left Stabilizer (NTSB Photo)



Figure 9. Left Stabilizer Deformation (NTSB Photo)

3.5 Vertical Stabilizer

The vertical stabilizer separated from the airplane with no heat or fire damage (Figure 10). The rudder and rudder tip cap with counterweight separated from the rest of the stabilizer. The rudder was not recovered. The vertical stabilizer was deformed to the right relative to the fuselage mount structure attached at the base (Figure 11). The fractured surfaces were visually inspected, and they had a dull, grainy appearance consistent with overstress fractures.



Figure 10. Vertical Stabilizer (NTSB Photo)



Figure 11. Vertical Stabilizer Deformation (NTSB Photo)

4.0 Maintenance Records

Maintenance records dating back to November 6, 2020, were reviewed. The 150 hour checks were performed on November 27, 2023, March 1, 2022, and November 6, 2020. The elevators and rudder were inspected per schedule with no findings.

There were three unscheduled records for work on the empennage. On March 1, 2022 the rudder horn thermostat was replaced. On November 27, 2023, the rudder tab boot was resealed and the horizontal stabilizer de-ice boot was patched at several locations. On October 5, 2022, an Ultrasonic Thickness Testing (UTT) on the left hand and right hand main wing spar lower cap was performed.

During the wreckage exam, aluminum access doors were noticed on the top skin of both horizontal stabilizers. Weights (a total of 4 pounds) were attached to the forward spars at these locations and were introduced to the design by Service Bulletin No. 85 Revision 2. The purpose of the Service Bulletin was to provide inspection and modification procedures for the horizontal stabilizer forward spar in the vibration-dampener weight location. The modification addressed field reports of cracks propagating from the weight retaining screw holes.

Submitted by:

Leani Benitez-Cardona
Aerospace Engineer (Structures)