NTSB Accident No.: DCA24MA063

NTSB Docket No. SA-543

Post-Hearing Submission of Spirit AeroSystems

Re: Hearing

Submitted: September 6, 2024

In the matter of the investigation of Alaska Airlines Flight 1282 [Boeing 737-9, Registration N704AL] Left Mid Exit Door Plug Separation that occurred at an altitude of about 16,000 feet shortly after departing Portland, Oregon, on a flight destined for Ontario, California, on January 5, 2024

Pursuant to 49 CFR § 845.13 and the invitation of the National Transportation Safety Board ("NTSB") Investigative Hearing Officer Doug Brazy[1], Spirit AeroSystems (also referred to herein as "Spirit") hereby presents its post-hearing submission to the NTSB.[2]

For ease of reference, this submission is organized as follows:

I. Supplier Source-Inspections/Delegations
II. Door Frame Rivet Replacement
III. Rivet Re-Work Documentation
IV. Final Rig of MED Plug

I. Supplier Source-Inspections/Delegations

Delegation of inspection authority to external suppliers is contingent on several requirements including but not limited to whether: 1) the supplier has current IAQG[3] 9100 certification and is in good standing; 2) the supplier has a quality system which meets the approval of Spirit's Supplier Quality Assurance group; 3) all Spirit Supplier Audit Reports and Root Cause Corrective Actions are completed and closed; and 4) the supplier's First Article Inspection First Pass Yield is over 98% and that level is maintained for a minimum of six consecutive months (or, depending on rate, exceeds 98% over six consecutive receipts). Thereafter, the supplier's

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[1] *See* NTSB Investigative Hearing Transcript, August 6, 2024, 18:14-19:3. (Cites herein to the investigative hearing transcript are set forth in page:line format.)

[2] Spirit AeroSystems reserves its right to present a separate party submission pursuant to 49 CFR § 831.14 and the invitation of NTSB Investigative Hearing Officer Doug Brazy. *See* NTSB Investigative Hearing Transcript, August 6, 2024, 19:4-16.

[3] IAQG is the acronym of the International Aerospace Quality Group which sets the standards for quality within the worldwide supply chain of the aerospace industry.

maintenance of this delegation authority and the extent of auditing activity by Spirit of the supplier is based upon the supplier's ongoing quality performance.

II. Door Frame Rivet Replacement

A. Overview

Regarding the door frame rivets that were replaced before the manufacture of the subject aircraft was completed by Boeing in Renton, six conclusions can be drawn from the investigative hearing exhibits and testimony:

1) Spirit AeroSystems contractors and Boeing personnel disagreed on whether the rivets were conforming;

2) whether the rivets were conforming depended on whether they complied with Boeing's specification;

3) the rivets were replaced because Boeing requested it;

4) the rivets did not present a safety issue;

5) "ugly" rivets may still be conforming; and

6) although Boeing described the rivets as "non-conforming" during the investigative hearing, none of the documents produced by Boeing (and none of the NTSB hearing exhibits) indicate the rivets were compared to the Boeing specification (*i.e.*, Boeing's records did not describe the "as is" condition versus the specified condition) nor do they specify which criteria of the Boeing specification were not met.

B. Disagreement Regarding Whether the Replaced Rivets Were Conforming

Elizabeth Lund, Chair, Quality Operations Council, Senior Vice President, Quality at Boeing Commercial Airplanes, testified that Boeing personnel disagreed with "Spirit" personnel (the "Spirit" personnel were Spirit contractors) as to whether the replaced rivets were conforming:

> …. The five discrepant rivets were identified on September 1st and the nonconformance was written.
> ….
> On September 8th, Spirit replied in the system to that tag that the rivets were acceptable as is, and did not need to be removed and replaced, that they were compliant with the process specification. On September 11th, Boeing quality reviewed that again, and found that to be not true, that the rivets were not conforming with our specification, and again removed those stamps. And again, asked Spirit to rework the nonconforming rivets.

See NTSB Investigative Hearing Transcript, August 6, 2024, at 214:9 – 215:5 (Testimony of Elizabeth Lund). This testimony was consistent with remarks Ms. Lund had made in statements prior to the hearing wherein she noted there was a dispute as to whether the replaced rivets were

conforming.[4]

The disagreement between Boeing and Spirit AeroSystems as to whether the rivets were conforming or required replacement was also discussed in the testimony of Mike Riney, Spirit's Senior Manager – Manufacturing General Support:

> Based on the discussion with the mechanics, I believe they felt the rivets were acceptable. That may have required removal of paint or the secondary primer application. And then to reapply paint. And then that's why they then stated on the Boeing's unauthorized rework pickup that they believe that the rivets met the requirements. I think that's image three. I think I was referring to image four, but yeah. So that's why -- that -- based on that image, that's why I believe that felt the rivets -- and that's a number five rivet, that's a very small rivet. So you're looking at a blown up image. But that's why I believe that they felt that the rivet tails were acceptable.
>
> [The contract mechanic] believed that the rivets met the BAC 5004-1 specification. When that was identified by the Boeing quality individual, they had written a[n] unauthorized rework pickup because the incorrect information was identified on the original pickup. And at that point, the mechanic working with the Spirit contract manager, at that point, stated that they had believed that the rivets met the BAC 5004-1 specification. In the Boeing timeline, this is also shown, and that's where the disagreement with the Boeing QA was identified. And then they in turn rejected Spirit's statement, and requested the rivets be removed and replaced.

See NTSB Investigative Hearing Transcript, August 6, 2024, at 229:1-12; 220:7-25 (Testimony of Mike Riney).

C. Whether the Rivets Were Conforming Depended on Whether They Complied with Boeing's Specification

Boeing's specification for the rivets governed whether the rivets were conforming. *See* NTSB Investigative Hearing Transcript, August 6, 2024, at 209:21–210:6; 215:2-5 (Testimony of Elizabeth Lund).

D. The Rivets Were Replaced Because Boeing Requested It

Testimony by both Boeing and Spirit AeroSystems made clear that the reason the rivets were replaced is because Boeing requested it:

> MR. JOHNSON: And in the previous panel you described the Shipside Action Tracker process. A SAT record was created by Boeing personnel to track a nonconformance record cited by the Boeing quality in the early

[4] *See Boeing's Unforced Error*, The Air Show Podcast, June 28, 2024, 4:25-4:57 (minutes:seconds).

stages of productions on line 8789. Can you please describe in detail the issues that led to the need to open the MED plug rework?

MS. LUND: …. [Boeing] asked Spirit to rework the nonconforming rivets.

See id. at 213:24 – 215:5.

MR. RINEY: … [Boeing] requested the rivets be removed and replaced.

See id. at 220:20-23.

E. The Replaced Rivets Did Not Present a Safety Issue

Ms. Lund told reporters that the rivets that were replaced "did not create a safety hazard."[5]

F. Rivets Can Be "Ugly" and Still Be Conforming

The fact that the Boeing specification, and not a subjective aesthetic determination, governs whether the rivets were conforming, was further made clear by the testimony of Scott Grabon, the Senior Director, 737/P8 Quality for Spirit AeroSystems:

MR. CRUZ: So in discussions with Spirit personnel, the investigative team heard the term defect and nonconformity in manufacturing. Can you describe the difference?

MR. GRABON: Nonconformance is a -- it's an item that does not meet the engineering requirements. The term defect, it's difficult with the word defect. Everything is a nonconformance in the quality. A defect can be a nonconformance. But just because there is a defect, it doesn't necessarily mean there's a nonconformance. And I think that's a, that's an important note we can – you can see something that is ugly, but it doesn't mean it's a nonconformance.

See NTSB Investigative Hearing Transcript, August 6, 2024, at 33:25–34:11 (Testimony of Scott Grabon).

G. Boeing's Documents Do Not Demonstrate the Rivets were Non-conforming

The Non-Conformance Record and Non-Conformance Order produced by Boeing do not indicate whether Boeing personnel ever measured the replaced rivets to determine whether they conformed to the relevant Boeing specification – BAC 5004-1. *See* NTSB Investigative Hearing Exhibit 11B – NCR N1450292531 and NCO 145-8789-RSHK-1296-002NC. Instead, the documents merely state, "rivet is damaged" and "damaged rivets are not acceptable." *See id*. In fact, it was the Spirit contractors, not Boeing, who documented that the rivet holes were

[5] *See* NTSB Memorandum for Record from Doug Brazy dated August 4, 2024, p. 15.

measured. *See id*., record of September 18 entry. The September 18 entry by the Spirit contractors, however, documented the results of the replacement of the rivets and therefore does not shed light on whether the original rivets were conforming.

III. Rivet Re-Work Documentation (The Contract Mechanic Confused the Fastener Replacement Work)

According to the investigative hearing testimony, the contract mechanic who had erroneously stamped that the original rivets had been removed and replaced, did so because he had confused his work on the subject aircraft's fuselage with similar fastener removal work he had performed that day on a different fuselage. *See e.g.,* NTSB Investigative Hearing Transcript, August 6, 2024, at 220:7–13 (Testimony of Mike Riney).

IV. Final Rig of MED Plug

Boeing testified that there were two points in manufacture that it was Boeing's responsibility to check the MED plug, notably in flow day one or two and then finally near the end of the manufacturing process with weight on wheels. See NTSB Investigative Hearing Transcript August 6, 2024 at 44:17–47: 1, 254:3-10, and 230:11–231:6 (NTSB Questions and Testimony of Elizabeth Lund).

The process for the check, weight on wheels, near the end of the manufacturing process is set out in NTSB Exhibit 11-U ("Excerpts from Boeing Mid Exit Door Plug Rigging Drawing"). Section 5.2.1 of the Rigging Drawing is labeled "Operational check," and it states as follows: "*Operate the completed plug and verify that it operates smoothly while clearing all body structure.*" (Emphasis added). In order to perform an operational check, the plug has to be operated, thereby removing the arrestor bolts.

CERTIFICATE OF SERVICE

Pursuant to 49 CFR § 845.13, on September 6, 2024, a full and complete copy of the Post-Hearing Party Submission of the Spirit AeroSystems, Inc. has been provided to the parties listed below via electronic mail, and U.S. mail upon request.

National Transportation Safety Board	
Association of Flight Attendants – Communication Workers of America	
Air Line Pilots Association	
Alaska Airlines	
Federal Aviation Administration	
International Association of Machinists and Aerospace Workers District 751	