NTSB | National Transportation Safety Board

Doug Brazy
Sr. Aviation Accident Investigator
AS-10

Date: 9/6/24

Subject: DCA24MA063 Alaska Airlines Flight 1282
Boeing 737-9, N704AL
Left Mid Exit Door Plug Separation in Portland, OR
January 5, 2024
Investigative Hearing - Member Brown's Questions

NTSB Board Member Brown was called away from the hearing to respond to an accident, before the Board of Inquiry questioning began. A list of his intended questions was sent to the Federal Aviation Administration, Boeing Commercial Airplanes, and Sprit AeroSystems. The questions and responses are attached.

<end>

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Air Carrier and Space Investigations Division (AS-10), Room 5349
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BOEING

Subject: Boeing Response to NTSB Member Brown Questions – Alaska Airlines 737-9 N704AL Decompression in Portland, Oregon on 5 January 2024

References: (a) Email, 19 August 2024, NTSB to Boeing, (AS1282 Hearing) Questions from NTSB Member Brown - Due Date COB Wednesday Aug 28
(b) Email, 19 August 2024, NTSB to Boeing, (AS1282 Hearing) Transcripts for your Review - Due Date COB Friday Sept 6

Dear Mr. Brazy:

In response to the reference (a) request to address Member Brown's questions from the DCA24MA063 NTSB Investigative Hearing on 6-7 August 2024, Boeing is providing responses as an enclosure to this letter. The original questions have been restated in the enclosure, and references to the hearing transcript attached in the reference (b) email have been provided in responses where applicable.

The information included with this correspondence is controlled under the US Export Administration Regulations (15 CFR Parts 300-799) and has been categorized as ECCN: 9E991.

Please feel free to contact us if you have any questions.

Best regards,

[redacted]

Stella B. Weidner
Director, Product Safety

Enclosure: Boeing Response to NTSB Member Brown Questions – Alaska Airlines 737-9 N704AL Decompression in Portland, Oregon on 5 January 2024

cc: John Lovell, NTSB Office of Aviation Safety, Investigator-in-Charge

Boeing Response to NTSB Member Brown Questions

Alaska Airlines 737-9 N704AL Decompression in Portland, Oregon on 5 January 2024

Panel 2 Questions and Answers

Q1: Can you explain to us the overall process on how an employee installs or removes a Mid Exit Door plug?

A1: Yes. Spirit installs the Mid Exit Door (MED) plug during its assembly of the fuselage. The MED plug is then inspected multiple times during the remainder of the manufacturing and assembly process. The MED plug typically is not removed after the fuselage arrives at Boeing. If removal and installation are required at Boeing, it would be governed under the Boeing removal process that would reference engineering requirements. See also Aug. 6 Tr. 136:10–19 (Grabon); 160:5–16 (Lund), 199:18–25 (Riney), 237:14–24 (Lund), 244:17–247:5 (Lund), 260:15–18 (Lund), 262:8–16 (Lund), 275:25–276:5 (Lund), 277:17–278:1 (Lund).

Q2: What sorts of things do you look for to assure the door plug is properly secured to the fuselage?

A2: Among other inspections at Boeing discussed at length during the hearing, the MED plug is examined during Flow Days 1–3 to ensure the retaining bolts are installed and the MED plug is properly secured. See also Aug. 6 Tr. 114:16–22 (Catlin), 142:16–143:7 (Lund), 152:20–154:7 (Grabon), 154:8–14 (Ackerman), 230:17–231:6 (Lund), 231:11–17 (Lund).

Q3: How many people oversee the employees responsible for the door plug, and what are their roles?

A3: In September 2023, one manager oversaw the door crew. That manager reports up through the manufacturing organization to the head of the 737 program. See also Aug. 6 Tr. 44:9–13 (Lund), 213:9–12 (Lund).

Q4: Boeing is a big company. How many layers of managers ultimately manage the door plug installation and removal process?

A4: See prior responses to Q1 and Q3.

Q5: What sorts of training does Boeing have for people making risk assessments and review of work related to door plugs?

A5: Boeing provides extensive training to its mechanics and quality inspectors, including initial foundational training, structured on the job training, and recurrent training. See also Aug. 6 Tr. 52:7–18 (Lund), 63:20–64:13 (Lund), 82:13–24 (Lund), 83:3–84:20 (Lund), 85:23–86:17 (Lund), 113:20–114:9 (Lund), 212:25–213:4 (Lund); Aug. 7 Tr. 29:1–9 (Silva).

Q6: What is the process employees use to report safety concerns?

A6: Boeing employees have a variety of processes to report safety concerns including raising concerns with their managers, working with the Line Side Control Center (LSCC) to use the Shipside Action Tracker (SAT), filing a Safety Health and Environmental Action Request (SHEAR) for workplace safety issues, and submitting Speak Ups for product safety concerns. See also Aug. 6 Tr. 68:6–8

(Catlin), 102:2–24 (Lund); Aug. 7 Tr. 33:24–34:16 (Catlin), 86:4–13 (Wright), 95:13–96:18 (Wright), 104:20–105:12 (Wright), 105:19–106:17 (Wright), 108:5–18 (Wright), 169:25–170:14 (Wright), 207:2–208:1 (Wright).

Q7: How do you assure all of your employees, including executives, first line managers and the manufacturing team, know how to report safety concerns?

A7: Among other things, Boeing provides training to its employees on safety reporting and engages in other safety promotion efforts. In addition to the portions of the transcript identified in the above response to Question 6, see also Aug. 7 Tr. 86:17–87:2 (Wright), 100:4–9 (Wright), 154:7–20 (Wright), 191:24–192:10 (Wright) and slide 10 of the slides submitted by Boeing for use at the hearing.

Q8: What steps do you take to help assure all of your employees feel safe to raise safety concerns?

A8: As stated above, Boeing provides training to its employees on safety reporting and the processes Boeing has in place to prevent retaliation. In addition to the portions of the transcript identified in the above responses to Questions 6 and 7, see also Aug. 7 Tr. 107:9–25 (Wright & Silva), 112:20–113:14 (Wright and Silva), 204:8–16 (Wright).

Q8.a: Can they go directly to their supervisors to raise a safety concern?

A8.a: Yes. See above responses to Questions 6–8, and the portions of the transcript identified therein.

Q8.b: Is there a direct line of communication to report safety concerns as far up the line as necessary?

A8.b: Yes. See above responses to Questions 6–8, and the portions of the transcript identified therein.

Q8.c: Can employee safety concerns be made anonymously?

A8.c: Yes. See above responses to Questions 6–8, and the portions of the transcript identified therein.

Panel 3 Questions and Answers

Q9: I understand Boeing has a voluntary Safety Management System, or SMS. When will it become mandatory?

A9: The FAA's SMS regulations become mandatory on May 28, 2027, 36 months from the effective date of the FAA's regulations. See also Aug. 7 Tr. 62:10–18 (Eick), 65:6 (Eick), 65:12–16 (Eick).

Q10: Help me understand how your safety system fits together– I believe there's Safety Risk Management, Safety Assurance, Safety Promotion, and Safety Policy. What are their roles and how do these work together in your system?

A10: The four pillars of Boeing's Safety Management System are Safety Risk Management, Safety Assurance, Safety Promotion, and Safety Policy. These pillars were addressed individually and in depth during the hearing, especially in response to the Technical Panel's questions. See Aug. 7 Tr. 70:9–71:13 (Wright), 80:22–81:12 (Wright), 82:1–83:5 (Wright), 85:9–86:1 (Wright), 90:7–93:17 (Wright), 95:13–96:18 (Wright).

Q11: We understand that Boeing is a global company– but is there anything unique about the Renton, Washington, production facility that is different from your other sites when it comes to safety procedures?

A11: Safety is Boeing's priority and the principles behind the workplace safety and product safety procedures are consistent across Boeing Commercial Airplanes' production facilities. The details of Boeing Commercial Airplanes' safety procedures at any one facility may vary from other production facilities because different model aircraft are manufactured in approved locations under Boeing's production certificate. Procedures in each location are tailored to the needs of those specific programs and models. Details of Boeing's workplace safety procedures may also vary due to differences in local workplace safety requirements.

Q12: Can you define Boeing's Safety Culture?

A12: Boeing's positive safety culture is made up of five elements: a reporting culture, a flexible culture, a learning culture, an informed culture, and a just culture. See also Aug. 7 Tr. 98:3–13 (Wright), 99:3–24 (Wright), 184:13–16 (Wright).

Q13: How are you incentivizing safety at Boeing?

A13: Boeing is undertaking widespread efforts to incentivize product safety, including through its safety promotion efforts as part of its safety management system. See above responses to Questions 6–8 and the portions of the transcript identified therein. See also Aug. 7 Tr. 203:20–25 (Wright), 204:23–205:25 (Wright and Silva), 206:16–20 (Wright).

Q14: As we know, although air travel is by far the safest mode of transportation, it sometimes only takes one thing to go wrong for that safety to be compromised. What steps in your safety and quality management process helps mitigate a catastrophic event?

A14: Boeing, with FAA oversight, has robust processes throughout its Design Certification, Safety Management System and Quality Management System to identify and mitigate the risks of a catastrophic event, including the Continued Operational Safety Program (COSP). See also, e.g., Aug. 7 Tr. 16:14–17:5 (Silva), 19:18–20:1 (Silva), 25:22–26:18 (Ackerman), 40:12–19 (Ackerman), 50:2–52:8 (Wright and Silva), 157:12–22 (Wright), 170:15–172:11 (Wright).

Q15: How is Boeing's Quality Management System, or QMS, integrated with your Safety Management System?

A15: As discussed in detail during the hearing, Boeing's Quality Management System and Safety Management System complement each other and are designed to

provide inputs and analysis to each other. Boeing is working to integrate the two systems more tightly. See also Aug. 7 Tr. 55:18–57:1 (Silva and Wright), 58:14–25 (Wright), 122:20–124:1 (Wright and Silva) and slide 7 of the slides submitted by Boeing for use at the hearing.

Q16: Are you making investments to improve the safety culture at Boeing?

A16: Yes. See above responses to Questions 6–8 and 13 and the portions of the transcript identified therein. See also Aug. 6 Tr. 281:12–21 (Lund); Aug. 7 Tr. 147:10–21 (Wright), 223:11–18 (Wright).

Q17: Help me understand your process for improving safety in the production and manufacturing environment – who is leading that process at Boeing?

Q17a: Who does that person report to?

A17 and 17a: Boeing is continuously seeking to improve safety in its production and manufacturing environments through a variety of initiatives and programs. For example, two of the most important ongoing initiatives are the Comprehensive Product Safety and Quality Plan and the maturation of Boeing's Safety Management System. Elizabeth Lund is leading the Comprehensive Product Safety and Quality Plan and she reports to Stephanie Pope, the CEO of Boeing Commercial Airplanes. Paul Wright is leading the maturation of the Safety Management System for Boeing Commercial Airplanes and he reports directly to Lacey Pittman, Vice President, Safety Management System, Global Aerospace Safety, who in turn ultimately reports to the Vice President for Products & Services Safety for The Boeing Company. See also Aug. 6 Tr. 43:11–13 (Lund); Aug. 7 Tr. 69:12–16 (Wright), 72:23–73:13 (Wright).

Q18: How do you make safety concerns not become routine at Boeing– not just checking a box? In other words, how do you prevent staff across the production line from becoming immune to safety?

A18: Boeing engages in a variety of training and other processes to ensure Boeing employees understand and properly prioritize safety. See above responses to Questions 6–8, 13, and 16 and the portions of the transcript identified therein. See also Aug. 6 Tr. 104:23–105:10 (Lund); Aug. 7 Tr. 96:22–97:24 (Wright), 138:5–14 (Silva).

Panel 4 Questions and Answers

Q19: What is the process by which the FAA checks that safety is being integrated within the 737 production line?

A19: Boeing defers to the FAA on this question.

Q20: Who trains FAA inspectors who come in to review companies like Boeing?

A20: Boeing defers to the FAA on this question.

Boeing Response to NTSB Member Brown Questions

Alaska Airlines 737-9 N704AL Decompression in Portland, Oregon on 5 January 2024

Q21: As the enforcement arm for airplane safety, the FAA is trusted to ensure the effectiveness of safety systems in manufacturing aircraft. As part of your enhanced oversight systems, when there are manufacturers like Boeing who have had recent incidents like this one, are there more inspections conducted with the company as a result of that incident? In other words, do you perform more audits as a result of an incident like this one?

A21: Boeing defers to the FAA on this question.

RESPONSES OF SPIRIT AEROSYSTEMS TO BOARD MEMBER BROWN'S QUESTIONS

The following are the responses to Member Brown's questions. These responses are limited to those questions directed to Spirit.

Questions for Panel 2 (page 1):

What is the role of Spirit employees (staffed by Aerotech, STROM, and Launch Technical Workforce Solutions) in Renton?

Answer: At the time the Alaska Airlines' fuselage was being manufactured in Renton, all Spirit mechanics/inspectors were employees of Spirit contractors. The only Spirit employee at Renton was Mr. Riney. The mechanics/inspectors were employees of the three companies identified. The role of the Spirit contract mechanics was to address any non-conformances noted by Boeing on fuselages received in the Renton factory. They did not engage in any manufacturing work and focused their efforts as directed by Boeing.

For further information regarding this topic, please see NTSB Investigative Hearing Transcript, August 6, 2024, at 167:6-168:1; 168:9-18; 175:11-176:3; 197:2-16; 203:10-204:14; 207:17-208:3.[1]

What changes has Spirit made since the accident regarding work in Renton?

Answer: After the accident, Boeing chose not to have Spirit contract inspectors inspect/signoff work done by Spirit contract mechanics. In this regard, it should be noted that before the accident, Boeing inspectors inspected/signed off any work done by Spirit contract mechanics even after Spirit contract inspectors had inspected/signed off that work.

Testimony concerning this topic can be found at 283:10-284:19 of the NTSB Investigative Hearing Transcript, August 6, 2024.

Issues (p-3, Brown questions):

Boeing/Spirit procedures for reporting/addressing discrepancies, anomalies or concerns from the floor up.

Answer: Spirit has a comprehensive safety reporting program/philosophy named Quality 360. Substantial testimony/evidence was offered at the hearing regarding Quality 360. *See e.g.*, NTSB Investigative Hearing Transcript, August 6, 2024, at 110:2-13; *see also* NTSB Investigative Hearing Transcript, August 7, 2024, at 46:3-19; 132:9-16.

Reports made regarding MED plug removal and reinstallation.

Answer: The evidence establishes that Spirit did not participate in the removal or reinstallation of

[1] Cites herein use "page number:line number" format.

the subject door plug in Renton. *See* NTSB Investigative Hearing Transcript, August 6, 2024, at 159:18-160:4. Accordingly, Spirit did not generate any reports regarding the MED plug removal and reinstallation.

Questions for Panel 2 (page 3):

What is the process employees use to report safety concerns?

Answer: Spirit employees report safety concerns via Spirit's Quality 360 program. For additional information regarding this process, please refer to the NTSB Investigative Hearing Transcript, August 6, 2024, at 110:4-13; *see also* NTSB Investigative Hearing Transcript, August 7, 2024, at 176:20-177:4. Spirit's contractors also have access to Spirit's Quality 360 program for anonymous reporting.

How do you assure all of your employees, including executives, first line managers and the manufacturing team, know how to report safety concerns?

Answer: By promoting awareness of the Quality 360 program. For testimony regarding this program, please refer to NTSB Investigative Hearing Transcript, August 7, 2024, at 106:20-25; 132:9-16; 139:2-5; 176:20-177:4. Also, every daily team meeting begins with a discussion of any known safety concerns or occurrences.

What steps do you take to help assure all of your employees feel safe to raise safety concerns?

Answer: By promoting awareness of the Quality 360 program that enables employees to report safety concerns without fear of retribution. For additional information, please refer to the NTSB Investigative Hearing Transcript, August 6, 2024, at 110:4-13; NTSB Investigative Hearing Transcript, August 7, 2024, at 132:9-16; 139:2-5; 176:20-177:4.

Can Spirit's employees go directly to their supervisors to raise a safety concern?

Answer: Yes. Further information on this topic is contained in the hearing transcripts. *See e.g.,* NTSB Investigative Hearing Transcript, August 6, 2024, at 109:14-18; NTSB Investigative Hearing Transcript, August 7, 2024, at 138:18-25.

Does Spirit have a direct line of communication to report safety concerns as far up the line as necessary?

Answer: Yes, through our Quality 360 program. *See* discussion of Quality 360, above.

Can employee safety concerns be made anonymously?

Answer: Yes, via the Quality 360 program. *See* NTSB Investigative Hearing Transcript, August 6, 2024, at 110:4-13.

QUESTIONS PANEL 4: FAA Oversight

***ISSUE:** Describe work plan and process for oversight of production: How is the audit schedule determined; Other methods/tools for oversight; Changes in oversight methods (designated vs direct, other)*

- What is the process by which the FAA checks that safety is being integrated within the 737 production line?
  (questions answered in transcript with slides and Kilgroe and Knaup beginning page 234 of transcript refer there)
- Who trains FAA inspectors who come in to review companies like Boeing?

***(questions answered in transcript;** MR. KNAUP page 280 begins line 7: So new ASI's that come to the FAA, there's a two year structured program that our ASI's run through, it's I believe it's over 240 hours of formal training that all of our ASI's go through. They also get on the job training elements as part of that. So they'll go out with the senior ASI, or one of our more experienced ASI's, to learn about the auditing process,apply the formal training that they've learned throughout, you know, to understand how to do our job. So it's -- that's the training process.)*

***ISSUE:** Effectiveness of FAA guidance and actions on manufacturing: SMS currently is not a requirement – how does this affect tasking for FAA oversight now, and in the future when it is required?; QMS; Training/enhanced oversight programs*

- As the enforcement arm for airplane safety, the FAA is trusted to ensure the effectiveness of safety systems in manufacturing aircraft. As part of your enhanced oversight systems, when there are manufacturers like Boeing who have had recent incidents like this one, are there more inspections conducted with the company as a result of that incident? In other words, do you perform more audits as a result of an incident like this one?

(Answered in transcript. Mr. Knaup beginning page 289 line 17:
MR. KNAUP: Enhanced auditing, enhanced oversight activity,was just what we -- a term we had used post the accident to discuss additional activities that we would implement. And I would say at this point those are, those are the -- that's the norm now.)