

August 6th, 2024, Transcript of NTSB Hearing for Boeing 737 MAX Door Plug Blowout

The following list includes the named participants and their associated companies based on the transcript:

- **Jennifer Homendy:** NTSB Chair
- **John Lovell:** NTSB Investigator in Charge
- **Pat Rowell:** NTSB Aerospace Engineer
- **Nils Johnson:** NTSB Maintenance Investigator
- **Sabrina Woods:** NTSB Senior Human Performance Investigator
- **Elizabeth Lund:** Boeing Commercial Airplanes
- **Doug Ackerman:** Boeing Commercial Airplanes
- **Terry George:** Spirit AeroSystems
- **Scott Gruber:** Spirit AeroSystems
- **Lloyd Catlin:** International Association of Machinists and Aerospace Workers
- **Michael Riney:** Spirit AeroSystems
- **Albert:** Airline Pilots Association
- **Hector Silva:** Boeing Commercial Airplanes (mentioned for future panel)
- **James Phoenix:** Former FAA Manager of Boeing Certification (mentioned in interview)
- **Ed Clark:** Former Boeing Vice President and General Manager (mentioned in interview)

Please note that some individuals may be referred to by their titles or roles rather than their names, and affiliations may be inferred from context. The list above represents the most likely associations based on the information provided in the transcript.

00:00:00:00 - 00:00:27:21

Jennifer Homendy

We will have breaks throughout. The first break will occur after the technical panel. Ask questions before the parties begin to ask their questions. However, if you need a break. Pass me a note. I'm not that formal. Throw a sticky up here. So, today's panel one will run from about 10 a.m. to lunch. The topic is overview of Boeing 737 Max nine manufacturing and inspections.

00:00:27:23 - 00:00:50:10

Jennifer Homendy

Following lunch, panel two will run until about. Well, whenever. we'll cover the events surrounding the opening and closing of the mid exit door plug tomorrow. We'll begin with panel three Safety management Systems and quality management systems, which will take us to the lunch break. And following lunch we'll have panel four on FAA oversight. We'll follow the same process for all panels.

00:00:50:11 - 00:01:13:22

Unknown

Mr. breezy will re-introduce the members of the technical panel and swear in the witnesses. And then witnesses will be questions. First by the technical panel. Second by the parties. Third by the board of inquiry. Parties will have designated time during each panel to question the witnesses. Each party will keep their questions to five minutes or less. We have a timer to help you stay on track.

00:01:13:24 - 00:01:43:03

Unknown

We do anticipate anticipate being able to accommodate more than one round of questions per panel. I will make all rulings on the admissibility of exhibits, appropriateness of questions and pertinence of proffered testimony. If a party spokesperson objects to any question asked during the hearing, or wishes to discuss admissibility of an exhibit or the pertinence of proffered testimony. Please raise your hand and wait to be recognized by me.

00:01:43:06 - 00:02:20:08

Unknown

A word about conduct. This is not an adversarial hearing. This doesn't mean tough questions won't be asked. They should be asked. This is an investigation. However, the board does not permit cross-examination of witnesses in the legal sense, nor do we assign fault or blame for an accident or incident as a result. We will not permit questions related to fault, outside litigation or legal liability, and general questions related to legal liability or fault are not relevant to the fact finding purposes of an investigative hearing or our statutory mission.

00:02:20:08 - 00:02:47:11

Unknown

We're here to improve safety. Before I invite the hearing officer to introduce the exhibits, I'd like to acknowledge the many people on team NTSB who've made this hearing possible. Office of the Chief Financial Officer. Office of the Chief Information Officer. Office of the General Counsel. Office of the managing director, office of Aviation Safety. Office of Research and Engineering.

00:02:47:12 - 00:03:18:10

Unknown

Office of safety, recommendations and Communications. And of course, the offices of members Graham, Chapman, Brown and Inman, as well as my team. I'd also like to give a shout out to our summer interns, Sierra Giuliano, which again is in the back, and Natasha maggio, who has assisted us in the preparation of this hearing. Our other fabulous interns are Jacob Wells, Caden Neri, Jeremy Braden Edwards, and Matthew Chen.

00:03:18:12 - 00:03:49:27

Unknown

Thank you all for your work throughout the summer. Next, the hearing officer will describe the exhibits. Mr. breezy. Thank you. Chair Jamadi. Exhibits for this hearing include reports produced by NTSB investigative staff, videos, and other documents submitted by the Technical panel members, witnesses, and parties to support the testimony. Questions you will hear over the next two days. The exhibits for the hearing are in the docket.

00:03:49:29 - 00:04:24:03

Unknown

The docket number is ESA Sierra Alpha 543. The NTSB is authorized by statute to disclose information to carry out its mission. But we protect confidentiality and proprietary information to the greatest extent possible. As such, the exhibits contain redactions. These are the result of negotiations between parties and the NTSB regarding the disclosure of information claimed to be personally identifiable, security sensitive, or proprietary in nature, though redacted.

00:04:24:04 - 00:04:58:10

Unknown

The exhibits contain sufficient information so that members of the public can refer to them during the hearing and throughout the NTSB investigation. The exhibits entered into the record, and any presentations, along with other records of the investigation become part of the NTSB public docket and are available via the NTSB website. [nts.gov](https://www.nts.gov). The public docket opened this morning. Party spokespersons and witnesses have been provided electronic copies of the public docket containing the exhibits identified above.

00:04:58:13 - 00:05:17:12

Unknown

The docket is located on the investigation page, which you can access in one of two ways. You can visit [nts.gov](https://www.nts.gov). Or if you've joined us in person, you can scan the QR code on the back of the adhering agenda. On the investigation page you will find the link to the public docket on the right hand side, just above the map.

00:05:17:14 - 00:05:43:03

Unknown

A transcript of the testimony taken during the hearing will be prepared and entered into the docket as soon as possible. In addition, Mr. Johnson will keep a list of any documents that are identified during the hearing which are not currently exhibits in the NTSB public docket. As a reminder, the party to the hearing has a new exhibit to propose in accordance with 49 CFR 840 5.9.

00:05:43:06 - 00:06:09:07

Unknown

It will not be admitted unless the chair determines that good cause has been shown. The documents will be submitted after the hearing and entered into the public docket. While the parties do not participate in the analysis of our evidence. You can submit written comments for

our consideration. This is where parties can state their views for the record, such as the potential conclusions that may be drawn.

00:06:09:09 - 00:06:42:20

Unknown

We strongly encourage parties to submit written comments which are beneficial to our analysis. Our regulations provide two separate opportunities to do this. First, you may submit comments on the hearing for 49 CFR eight 45.13 following an investigative hearing. Any party to the hearing may submit proposed findings to be drawn from the testimony and exhibits, and proposed probable cause and proposed safety recommendations designed to prevent future accidents or incidents.

00:06:42:22 - 00:07:04:24

Unknown

The proposals shall be submitted within the time specified by the Investigative Hearing Officer at the close of the hearing, and shall be made part of the public docket. Parties to the investigative hearing shall serve copies of their proposals to all other parties for the hearing. Such comments are due to me, the hearing officer within 30 days after the close of the hearing.

00:07:05:01 - 00:07:38:00

Unknown

And that's Friday, September 6th, 2024. We ask that any submissions be sent to us electronically. The second opportunity to submit comments is through the traditional parties submission process, outlined in 49 CFR 831.14. Any party to the investigation designated under 831 date 11th May submit to the NTSB written proposed findings to be drawn from the evidence produced during the course of the investigation.

00:07:38:03 - 00:08:09:00

Unknown

A proposed probable cause and or proposed safety recommendations designed to prevent future accidents. A due date for this submission will be provided at a later time. You may avail yourselves of one or both, or neither of these opportunities. If you do send comments at any point, they will be included in the public docket. As mentioned, we will consider party comments during the analysis phase of the investigation and our preparation of the final report.

00:08:09:02 - 00:08:23:23

Unknown

Garamendi. That concludes my remarks. Thank you. Thank you, Mr. Breezy. I'll now ask investigator in Charge, John Lovell, to provide an overview of the accident laws. Yours.

00:08:23:25 - 00:09:01:13

Unknown

Good morning. As you heard in the chair's opening remarks on January 5th, 2024, about 1714

Pacific Standard Time, Alaska Airlines Flight 1282, a Boeing 730 7-9 Max, return to Portland International Airport, Portland, Oregon. After the left mid exit door Med Plug departed the airplane, leading to a rapid decompression.

00:09:01:15 - 00:09:48:14

Unknown

After takeoff, the captain said that while climbing through about 16,000ft, there was a loud bang. Both flight crew said they immediately donned their oxygen masks. They added that the flight deck door had blown open due to the rapid decompression in the cabin. It was very noisy and difficult to communicate among themselves and with the cabin crew. The flight crew immediately contacted air traffic control, executed the emergency procedures, landed on runway two eight, left and taxied to the gate without further incident.

00:09:48:17 - 00:10:38:02

Unknown

After the rapid decompression, meanwhile, in the cabin, the oxygen, the emergency oxygen mask deployed and the cabin crew performed their safety functions to assist passengers to include secured the cockpit door that had blown open, donned oxygen masks so that they could then assist passengers attempted to communicate to the flight crew, but it was so loud that they could not hear a response, assess the condition of the cabin, issued instructions, and did appropriate individual checks on passengers, such as an unaccompanied minor, and they prepared the cabin for the emergency landing.

00:10:38:04 - 00:10:54:05

Unknown

Left medi plug was recovered from a neighborhood backyard. The plug and the associated hardware are shown on this slide.

00:10:54:08 - 00:11:03:01

Unknown

The accident airplane was equipped with an medi plug, which is a customer option.

00:11:03:03 - 00:11:34:28

Unknown

The medi plug is not meant to be open during operation. It is only operated during inspections. The investigation found that the medi plug left the Boeing Renton manufacturing plant and was delivered to Alaska Airlines, without the four bolts having been installed that were required to secure it to the fuselage.

00:11:35:01 - 00:12:14:17

Unknown

The left and medi plug was installed and pre rigged on the fuselage. On July 18th, 2023 at spirit AeroSystems, you will hear more about this process in the first panel that talks about

manufacturing. The close and verify Pre-Read task was accomplished on July 28th, 2023. Per production order, officials were shipped by train to the Boeing Renton facility on August 31st, 2023.

00:12:14:20 - 00:12:54:12

Unknown

Evidence showed that the required four retaining bolts were installed. At that time it was inspected and no non conformance reports or encoders were issued against the Medi plug. If a discrepancy is noted with the plug, an encore is generated and the repair or rework is performed. Boeing does not open the medi plug unless a discrepancy is found.

00:12:54:15 - 00:13:35:24

Unknown

Boeing production process typically has nine factory floor day positions in the 730 7-9 final assembly process, six of which can affect the Medi plug. Records show that on September 1st, 2023, an NCR was created, noting five damage rivets on the edge frame forward of the left medi plug. On this slide, the yellow circles show the location of the damage rivets.

00:13:35:27 - 00:13:49:01

Unknown

To rework the damaged rivets. Access required opening the left medi plug as shown on the slide. Now.

00:13:49:04 - 00:14:27:25

Unknown

Rivets were replaced per non conformance order and was completed on September 19th, 2023. By contract spirit AeroSystems. Personnel at the Boeing Renton facility. The empty plug was then closed and the airplane was delivered to Alaska Airlines. As stated earlier, post accident evidence showed that the retaining bolts were not installed. The blue circles show the location where the bolts should have been installed.

00:14:27:27 - 00:14:43:29

Unknown

Insulation is covering the fourth location. More details about the opening and closing of the left medi plug will be discussed in panel number two.

00:14:44:02 - 00:15:29:16

Unknown

This slide shows that between September 18th, 2023 at 5:16 a.m. and September 19th, 2023 at 10:56 p.m., the medi plug was opened. The rivet rework was performed and the medi plug was closed. This information is the culmination of NTSB's review of Boeing's ship side action tracker, or SRT, of text messages, photographs, interviews, installation plans, non conformance records and non conformance orders.

00:15:29:19 - 00:15:59:00

Unknown

Panel three will discuss the Quality Management System and Voluntary Safety Management System and panel four will touch on FAA oversight so that by the end of this investigative hearing, there should be a better understanding of how the four retaining bolts escaped. Establish processes.

00:15:59:03 - 00:16:36:22

Unknown

NTSB staff was notified of the accident on the night it occurred, and the NTSB go team launched the following day to Portland, Oregon to investigate. Listed people on this slide, assisted in the conduct of and are supporting this ongoing investigation. Chair of the NTSB. Traveled with the investigative team and acted as the agency's spokesperson.

00:16:36:25 - 00:16:40:26

Unknown

Next slide.

00:16:40:28 - 00:17:28:13

Unknown

NTSB invited qualified persons to act as parties to participate in the investigation. These entities include the. These entities included Airline Pilots Association, Alaska Airlines, the Association of Flight Attendants, Boeing Commercial Airplanes, the Federal Aviation Administration, the International Association of Machinists, Union, and spirit AeroSystems. As the chair mentioned, Boeing is a party to the investigation, but is not a party to this investigative hearing.

00:17:28:15 - 00:17:53:10

Unknown

Madam chair, this concludes my opening statement, and I now turn it over to you as peer of the Board of Inquiry. Thank you very much, Mr. Level. Will now begin with the first panel. Will the hearing officer please introduce once again the members of the technical panel, bring up the witnesses and then swear in the witnesses. Yes, ma'am.

00:17:53:11 - 00:18:36:02

Unknown

Thank you. Will our witnesses please take their seats at the table across from the room, please?

00:18:36:04 - 00:19:21:27

Unknown

Just for Harmony. The first panel is overview of the seven through seven Max nine. Refactoring and inspection panel will address 737 Max nine. In general, panics. Don't know what chemicals bearing the signing of tasks. The process of documenting not of the ship's side action trend and

its intended use. Description of the manufacturing execution and its intended use and the procedures for dark removal of previously in charge or components.

00:19:21:29 - 00:19:47:06

Unknown

Into the panel, according to my right, is composed of Mr. John Loeb, the investigator in charge. Mr. patrol will lead aerospace. Mr. Hansen, aviation investigator, for updates. Doctor science in your human.

00:19:47:09 - 00:20:37:02

Unknown

Witnesses for panel one and the following individual from my last board members is Elizabeth Lund of Quality Operations and senior vice president at Boeing Commercial. Mr. Doug, vice president over quality Boeing points. Mr. Terry George, senior vice president and general Boeing Spiro areas. Mr. Scott Gruber 737 and eight quality at spirit AeroSystems. And Mr. Lloyd Catlin, business representative at the International Association of Machinists and Aerospace Workers.

00:20:37:05 - 00:20:46:19

Unknown

I now ask that the witnesses please stand to be sworn in.

00:20:46:22 - 00:21:15:01

Unknown

Please raise your right hand and please answer by saying I do. Do you swear or affirm that the testimony you will give in this hearing will be the truth, the whole truth, and nothing but the truth. Thank you. Please be seated. As a reminder to the witnesses, you will remain under oath until the conclusion of the hearing. We ask that you answer questions factually and avoid analysis.

00:21:15:03 - 00:21:24:18

Unknown

Finally, please push the microphone button to talk and then push it again. When finished.

00:21:24:20 - 00:21:52:04

Unknown

Here, Harmony. These witnesses have been pre-qualified and their respective experience and qualifications appear in the docket as exhibits. I would now like to turn the questioning over to Mr. Cruz. Before you begin, Mr. Cruz, two things. one, because I asked the parties and now that Boeing is up here, I'm going to ask, Miss Lund on behalf of Boeing to indicate indicate whether Boeing understands and remains committed to upholding the NTSB party agreement.

00:21:52:04 - 00:22:17:00

Unknown

And in its entirety, please answer yes or no. Yes. Thank you. And for a word of caution for everybody here. Board of inquiry. Technical panel. Parties. Witnesses. There are a number of names of personnel. Some are not redacted. Some are redacted in the in the docket. Some do not use it. You can use positions. You can use what?

00:22:17:00 - 00:22:45:16

Unknown

What work crew. Not names of those personnel who have been, redacted. Thank you so much, Mr. Brasi. Mr. Cruz. Morning, Mr.. George, what are your roles and responsibilities as the spirit AeroSystems senior vice President general manager of Boeing Programs? Can I ask the staff to pull the microphones closer? And can you, repeat that question one more time, Mr. Cruz?

00:22:45:18 - 00:23:19:18

Unknown

Sure. Mr.. George, what are your roles and responsibilities as the spirit AeroSystems Senior Vice President general Manager of Boeing Systems? I'm the leader for Wichita and Tulsa, mainly the Boeing programs for all of the operations, which includes fabrication and assembly. the support groups, and also tooling and facilities. Thank you. Similarly, Mr. Graybar, what are your roles and responsibilities as a spirit AeroSystems Senior Director?

00:23:19:25 - 00:23:45:23

Unknown

7378 Quality. Good morning. I'm responsible for the oversight of the quality organization covering the seven, three, seven as well as the eight to ensure that we are perform performing and, performing to meet the compliance requirement. Thank you, Mr. George. The spirit AeroSystems hold the production certificate.

00:23:45:26 - 00:23:58:20

Unknown

We do not, but, could you can I ask the witnesses to to also speak up and pull the microphone? Thank you.

00:23:58:23 - 00:24:27:16

Unknown

Do you generally describe what components Spirit Air System manufacturers for the Boeing Company and describe the spirit AeroSystems fuselage manufacturing process in the Wichita plant? In the Wichita plant, we have, all of the Boeing board sections. we also have the seven, three, seven, the entire fuselage, all of most of the Boeing propulsion, us, and items.

00:24:27:18 - 00:24:39:16

Unknown

So the, the sales in Tulsa, we have mainly the wing components for, the Boeing aircraft.

00:24:39:18 - 00:25:10:12

Unknown

What is the company's organization or importing structure like starting from spirit production personnel? Like I said earlier, I'm the senior vice president. So I have 9 or 10 either vice presidents or directors that report to me, most of them in Wichita, but also, one in Tulsa. And again, it's, It's divided into, for example, the seven, three seven fuselage has a leader.

00:25:10:15 - 00:25:29:17

Unknown

The propulsion package has a leader. the 737 thrust reverser has a leader. My fabrication area has one. the tooling and facilities group has a separate leader. the same in Tulsa. That's generally how we're organized.

00:25:29:20 - 00:25:43:04

Unknown

Madam chair, I believe we have a video that might. And Mr. Cruise, a video that might explain the production better. we could call that up. I would request.

00:25:43:06 - 00:26:03:10

Unknown

A good morning. Yeah. So let's pause here, please, on this slide. This this video is a time lapse video of the build of the 737 fuselage at spirit AeroSystems. So I'm going to ask that you pause on the first two slides or some technical data that may help everybody in the room understand what you're going to see through the through the time lapse video.

00:26:03:10 - 00:26:27:21

Unknown

It takes approximately three minutes for the entire video. Okay. Please proceed to the first slide. Okay. Let's pause. So this is the spirit responsibility. all areas in blue like Terry just mentioned are what spirit is responsible for. This video is going to concentrate on the fuselage section, which is the tubular section running diagonally on the screen.

00:26:27:23 - 00:26:45:12

Unknown

The fuselage is made up of six independent sections that will all become one piece, one part number at the very end. It will also comprise approximately 70% of the total structure of the 737. Okay, next slide.

00:26:45:15 - 00:27:10:23

Unknown

Let's pause here for just a second. So this is the spirit work statement. This is specific to a single fuselage. there's approximately 18,000 parts per fuselage, 200,000 fasteners per fuselage. at the current rates, that equates to approximately 6.2 million fasteners per month and

74 million fasteners, per year. There's also 288 suppliers. That's both domestic and international.

00:27:10:28 - 00:27:34:18

Unknown

it's important to note that based on the size and scope of this, of this, build, spirit is an ass 9100 certified facility, meaning that, our quality management system conforms, to the international standards for our space manufacturing. we do that through the use of approximately 250 quality inspectors who perform both in process as well as final inspections.

00:27:35:05 - 00:28:05:29

Unknown

and it's also important to note that both Boeing and the FAA, historically and currently have had an onsite presence at spirit to help oversee quality as well as regulatory, oversight. Okay, so let's proceed with the video. And this is, it's going to it'll move pretty quickly. The the video takes place entirely in Wichita, Kansas. this is our global design global logistics center, where, detailed parts received from all around the world as well as spirit fabrication.

00:28:05:29 - 00:28:31:18

Unknown

Spirit also receives raw material. This raw material, such as this aluminum, large aluminum, plates will be made into skins on the 737 spirit processes at our own facility. Following processing, those detailed parts will be brought to the floor. They'll be made into assemblies, and they'll feed the sections that were described on the first slide.

00:28:31:21 - 00:28:58:27

Unknown

These are our floor beams. Floor beams are made for each section of the fuselage. Each section, the floor beams will be integrated into each section, before the sections are moved into B and integrated into a final fuselage. Spirit also uses technology, such as what we call spiffy, which is both a touch and a scanning technology used to measure fastener head height.

00:28:58:29 - 00:29:37:09

Unknown

So this is also our auto fastening machinery. similar to spiffy, where, 50% of the through scanned fasteners are done through our auto fastening process. Following auto fastening, the majority of drilling and filling is done by hand. Upon completion of each section, the sections will be lifted up by crane that you see here, brought over to our integration area, where they'll be lowered onto positioning Pogos, the positioning Pogos and laser align first the lower sections at you, and then the forward and aft sections are brought together.

00:29:37:11 - 00:30:05:07

Unknown

Spirit also uses industrial engineering type technology. that ensures that the proper person is at the proper place, at the proper, proper time. Throughout the build in the fuselage. Once the flaps and joints are completed, you now have all sections have become a single fuselage. Once complete, the fuselage will be lifted out of integration and brought over to our seal Bay area by crane in seal Bay.

00:30:05:07 - 00:30:19:02

Unknown

The interior and exterior seal will be applied. from there it'll go to our camo facility in camo. It'll be primed, painted and corrosion inhibitor applied.

00:30:19:05 - 00:30:49:20

Unknown

Spirit also has a facility in Subang, Malaysia. in Subang we do detailed parts as well as assemblies. This is where the mid exit door plug is built, packaged and shipped to the Wichita facility. Once saved in Wichita, the door will be installed and pre rigged. As noted earlier, in the statements, once all the structure is complete on the 737 fuselage, the unit is placed on a railcar and prepped to ship.

00:30:49:27 - 00:31:21:06

Unknown

At this point, Boeing spirit delivers the air the fuselage to Boeing. Boeing then pulls the fuselage approximately 2000 miles over a course of about 12, on average 12 days to its Renton facility. the 737 plant in Renton, Washington, at which point the empty fuselage will be stuffed with, electrical hydraulics interiors and be integrated into a 737 aircraft.

00:31:21:09 - 00:31:30:29

Unknown

Thank you for that presentation. How many manufacturing lines are there for the seven, three, seven fuselage in Wichita?

00:31:31:01 - 00:31:56:12

Unknown

Sorry. Can you repeat that? Yes. How many manufacturing lines are there for the seven, three, seven fuselages in Wichita? Currently we have an integration tool. That's the best way I can answer that question. And what Scott just showed you when we were loading each of the sections into integration tools with the help of the, the IT manipulators into those.

00:31:56:14 - 00:32:29:10

Unknown

And how long does it take to manufacture a 737 fuselage in Wichita? Again, it's a difficult question. We think about starting with the purchase of raw material. It's 12 months, so we purchase raw material, we fabricate parts, we do subassemblies. we, also, assemble the

sections and then into integration. So generally it's about a 12, 12 month time period.

00:32:29:12 - 00:32:37:29

Unknown

But spirit documents are used to manufacture the fuselage.

00:32:38:02 - 00:33:01:19

Unknown

In order to manufacture the live spirit utilizes, what we call efps, which are instructions. each section is built up via all the instructions, make the detailed parts and the assemblies. I'm not sure if. Does that answer your question? Yeah. Is there like a hierarchy of documents that you have as far as the production orders or anything like that?

00:33:01:19 - 00:33:22:09

Unknown

Well, we, we follow our, our ships, our production orders, as well as our, our procedures and policies. we do have we also have bases which are, which are Boeing documents, that have very specific requirements that we must meet.

00:33:22:11 - 00:33:40:14

Unknown

The spirit on the documents or those Boeing. Spirit owns our our work orders Boeing go and certain specifications. Okay. And how often are the manufacturing documents audited for clarity and ease of use.

00:33:40:16 - 00:34:07:16

Unknown

Spirit's under a continual audit process. we we audit based on, either certain findings throughout other audits or annually in certain areas. It really does depend on if there's been any findings and how often. If we audit, let's say, annually, if we've had findings on certain areas, will perform additional audits.

00:34:07:18 - 00:34:32:16

Unknown

Would you please describe the spirit process? Should there be a discrepancy during the manufacture of a fuselage? How is this discrepancy tracked and managed? If a discrepancy is found, we really have two means to document. One we is a is called a pick up. What we refer to as a pickup, a pickup is a a non a non conformance that does not require an engineering disposition to be brought back.

00:34:32:19 - 00:34:59:09

Unknown

Two engineering requirements. the second means that that spirit utilizes is is a non current in an

NC, a non conformance. what that is is referred to as a tag. the defect will be, will be detailed on the tag location type of defect, the part numbers reference to drawing numbers engineering will provide a disposition of how to how to correct the defect.

00:34:59:20 - 00:35:18:28

Unknown

will not be brought back to engineering, original engineering, but it will be brought back to another acceptable means for engineering. Engineering has the final say, once the engineering disposition is created, the operations team will perform. The rework quality team will re inspect and accept.

00:35:19:00 - 00:35:49:24

Unknown

When discussions with spirit personnel, the investigative team heard the term defect and nonconformity in manufacturing. Can you describe the difference? Non conformance is a it's an item that does not meet the engineering requirements. the term defect it's it's difficult with the word defect. Everything is a non conformance in in the quality. a defect can be a non conformance.

00:35:49:24 - 00:36:10:14

Unknown

But just because there is a defect it doesn't necessarily mean there's a non conformance. 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 non conformance.

00:36:10:16 - 00:36:47:15

Unknown

Spirit production documents show that there are inspection points the manufacturing records how and who determines these inspection points. Inspection points are determined by quality manufacturing or engineering. Typically, depending on on where how the build is, is made. You can have an and you can have an inspection point, added by, by having additional findings later on throughout the build as we mature, just to add an inspection point, to add an extra layer of oversight.

00:36:47:18 - 00:36:58:08

Unknown

Is there a difference between spirit manufacturing, personal inspections and spirit quality personal inspections? If so, what? What are the differences?

00:36:58:10 - 00:37:27:16

Unknown

Spirit manufacturing doesn't perform inspections with the quality team. And, performs inspections. Manufacturing can identify an area to be inspected, but only a qualified, spirit

inspector can actually perform the inspection. Is there any certification requirements to be, the quality inspector? quality inspectors are a specific job code. And it is. It is, which is different than, a manufacturing person.

00:37:27:25 - 00:37:39:09

Unknown

spirit quality, quality inspectors, also go through training, in order to become inspectors.

00:37:39:11 - 00:37:56:15

Unknown

So should Spirit Systems decide there needs to be a change in the manifest in the manufacturing process or any change is coordinated with Boeing. And how does spirit communicate this to the FAA?

00:37:56:26 - 00:38:22:28

Unknown

I would say we have updates to our manufacturing plan continuously, as part of continuous improvement, generally not coordinated with Boeing. But there are times where, there is a need for coordination with Boeing. It is not coordinated through to the FAA from spirit.

00:38:23:01 - 00:38:56:18

Unknown

With those changes, how are the implemented changes communicated to the manufacturing personnel? We have, paper or installation plans. That's the that's what tells the manufacturing community how to perform the work. If there's a change, we we have the term of a red flag. So on that installation plan, it will flag it that there's a change to, give the mechanic a heads up.

00:38:56:20 - 00:39:04:21

Unknown

Where all your production records kept is in an a system of some sort.

00:39:04:24 - 00:39:26:27

Unknown

The production records are kept in our, mass system manufacturing execution system. And what is your, typical spirit record retention policy for these records? I'll have to come back to you with exactly how long we hold on to the. How long? That means the records are for the lifetime of the airplane. I just don't know how long we keep them in.

00:39:26:27 - 00:39:48:25

Unknown

In Wichita. We then put them in long term storage. I just don't know what that timeframe is. Thank you, doctor woods. Thank you. I believe this question is for Mr. George. By all means, pass it off. If that's incorrect, I'm. At the time of the accident, what was your average production

rate for the year? For seven, three, seven?

00:39:48:25 - 00:40:21:04

Unknown

Fuselage. At that time, it was 38 airplanes a month. And currently, what is your production rate? Production rate is 31 airplanes a month. What goes into dictating how your production rate fluctuates? generally, it's, Boeing controls the master schedule, if you will. They're going to determine, number of deliveries, etc.. Our rate is going to be based off of their rate.

00:40:21:04 - 00:40:30:10

Unknown

There is some buffer inventory between us. So it doesn't always have to be exact, but it's very similar.

00:40:30:12 - 00:41:13:22

Unknown

When you change that rate, what sort of change management process does spirit employ to ensure that you maintain the same level of conformity and safety with each change we go through, rate readiness process and basically what you're doing and you're looking at, all resources. So human resources, tooling, machines, space, from there we're doing our calculations of what additions need to be made to be able to go from, a lower rate to a higher rate, obviously hiring personnel, adding the equipment, etc..

00:41:13:24 - 00:41:50:10

Unknown

That answer it. It does. Thank you. So, given the last five years or so, has spirit AeroSystems ever decided against a rate change of any sort? For instance, trying to go from a lower rate to a higher rate? Or conversely, you know, that's a that's a good question. So with Covid and the Max grounding between, ourselves and Boeing, there were times where we had, some very great conversations about should we or should we not go to a particular rate increase.

00:41:50:10 - 00:42:09:19

Unknown

So they have the they have the authority. So we are obviously going to fall, fall in line on whatever that rate increase is. But because of the situation in the last five years, we have had some, good conversations relative to should we or should we not?

00:42:09:21 - 00:42:42:06

Unknown

Thank you, Mr. Johnson. This morning, two things about my group of questions. My group questions were for spirit. So I don't. Mr.. Also, the perspective is that the September 2023 timeframe, if something's changed between September 23rd and now, please. In effect in September. Nils, we can't hear you. I'm sorry. did you guys catch that, or should I repeat, I think

we got most of it.

00:42:42:09 - 00:43:18:09

Unknown

Okay, two out of sequence production tasks ever occur on the seven, three, seven production line? When we think about. Scuse me, out of sequence. Out of sequence is, relative to spirit, but, as opposed to spirit and Boeing. So we'll just start right there. we do have out of sequence activity. I would just, for example, the last seven months, obviously we try to minimize it and there's a management decision associated with how much is enough.

00:43:18:11 - 00:43:47:07

Unknown

I would tell you the last seven months, for example, we've been at our lowest levels ever in terms of out of sequence or travel. We're okay. Do you have a formal process for dealing with out of sequence production tasks? we do not, meaning that, and I've seen this again. I'm 41 years with Boeing and Spirit, but I've seen it done a couple of different ways where you would actually create travel apps.

00:43:47:24 - 00:44:12:06

Unknown

but we we do not do that. And we haven't done that since we became spirit 19 years ago. In January of 2023, the investigative team witnessed at spirit and MD plug being installed on a fuselage. The technician was observed using a lubricant not called out by the engineering documentation to assist in closing the plug, and to protect the seals from damage.

00:44:12:13 - 00:44:41:14

Unknown

Did spirit authorize the use of a lubricant? Contrary to the requirements of the engineering documentation? We, again, we have had, some good conversations with the Boeing Company, because both companies regard rig these doors. this particular, mad door with the end gate and the bulb seal and the friction associated with it. You have to have a lubricant of some type.

00:44:41:16 - 00:45:11:16

Unknown

Otherwise you're going to tear the you're going to tear the seal. And the conversations through the years have been what's the what's the appropriate lubrication. So everything from Vaseline to, to baby powder to liquid soap, etc.. And so to answer your question, it was left up to the mechanic at that time, to determine what the appropriate lubrication should be.

00:45:11:19 - 00:45:25:09

Unknown

Since that time, we have created engineering green line that now calls out the dong. so as the preferred delivery.

00:45:25:12 - 00:45:53:03

Unknown

So the corrective action was formal documentation, in the engineering documentation to call out the right, lubricant. It was it's through a green line. It exists today. It actually officially went in into effect, I think some some time in May. But is the process spirit AeroSystems uses to remove a previously installed installation?

00:45:53:05 - 00:46:17:20

Unknown

Spirit as a removal process. It's the documentation. Any time, you have a completed installation, the paperwork is closed. So spirit performs a removal or removal documents, anything that needs to be taken apart so that the formal documentation exists to put it back together. Madame chair. Niels, I think you I just one correction. I think you said January 2023, 2024.

00:46:17:20 - 00:46:26:13

Unknown

Correct, I meant September what it was as of September 2023.

00:46:26:15 - 00:46:34:27

Unknown

The time that 8789 was being fabricated. Okay. Fair enough. Thank you.

00:46:37:27 - 00:46:44:02

Unknown

The spirit had any issues with undocumented removals?

00:46:44:04 - 00:47:09:03

Unknown

Where it has, throughout our our very complex build, there has been times where we have had undocumented removals. Those are corrected via, corrective actions inside of our factory, as well as disciplinary actions if needed. Okay. I was going to ask what the corrective actions were that you put in place to prevent it from reoccurring. And you're saying, changes to the process and formal corrective action.

00:47:09:03 - 00:47:34:29

Unknown

Yeah. So so we have to be be careful with if someone if someone, let's say, misses a removal process. the first thing we have to learn is that they miss a removal process because they just didn't understand the process, at which point they need to be retrained and reeducated on how the removal process works. otherwise, we will look at disciplinary measures for avoiding a process.

00:47:35:02 - 00:47:53:12

Unknown

Spirit finds an issue or an escape, related to manufacturing. What is the process for corrective action on the production line? And the second question is how is Boeing notified when this occurs?

00:47:53:14 - 00:48:15:04

Unknown

So can you repeat the first part of that just to make sure I'm clear on the answer, if spirit finds an issue or an escapement related to the manufacturing, what is the process for corrective action on the production line? I'll stop there. Okay, so if there's a if there's an escape from spirit AeroSystems and it's identified by spirit, we have a notice of escapement.

00:48:15:11 - 00:48:45:21

Unknown

process that process I the first thing we do is look for scope and bound. what was the defect? What was the escape, I should say, when did it occur? What aircraft are affected, what line units are affected. And so we look for scope inbound first. we'll also then formally, perform line checks throughout our factory, meaning we will look at everything that's in our production system and, and perform an inspection to see if there is any of those defects found in our production system.

00:48:45:24 - 00:49:04:16

Unknown

At that point, the, you know, we will be written with the with the scope and bound for anything that is not what is but is, no longer in spirit's possession. And then the corrective action will be, we do a root cause, corrective action as to why the defect occurred. Is it a manufacturing, issue? Is it a is it a planning?

00:49:04:16 - 00:49:31:28

Unknown

Is it a, an engineering issue, whatever that is. And that will then be corrected. And what is the process used to notify Boeing if this happens? The no process. So once, once, the defect is determined to have escaped the spirit factory and we give them a notice of investigation now, which as a preliminary to the notice of the statement, it's more, more of a heads up.

00:49:32:01 - 00:49:50:20

Unknown

So if you have if if Boeing then has, an aircraft that they say it's ready to deliver, they'll know that, that there's potential for this defect to occur, then the official true official notification is the notice of escapement, which is the formal document that is then released, the Boeing indicating what units are affected, what exactly is affected.

00:49:50:22 - 00:49:59:14

Unknown

And, working on the root cause corrective action. Thank you, Mr. Cruise.

00:49:59:16 - 00:50:14:24

Unknown

Thank you. Miss Lund, what are your roles and responsibilities as the Chair of Quality operational Counsel and the senior VP of, Boeing commercial aircraft? one commercial airplanes.

00:50:14:26 - 00:50:38:05

Unknown

Thank you. I have three primary roles. Number one, as you mentioned, as the chair of the Quality Operations Council, which is a role in which I represent quality across the Boeing Company at the executive level, two representing all business units at our Executive Council. I also, as you mentioned, is the leader of quality for Boeing Commercial Airplanes.

00:50:38:12 - 00:51:09:02

Unknown

And in that role, I lead, a team of approximately 7400 quality professionals across the BCA organization. And then lastly, I am responsible for the development and execution of our comprehensive safety and quality plan, which we have put in place post the Alaska Accident. Thank you. Mr. Ackerman. What are your roles and responsibilities as the Vice President and supplier of quality Boeing Commercial Airplanes?

00:51:09:04 - 00:51:32:21

Unknown

Good morning. I have, two responsibilities, that that cover the parts that we bring into our factories. part of it is for our external supply chain, where I have a team that is responsible for working with our external suppliers. I oversee their quality management system and ensure we have conforming parts coming in. The other half is for our internal fabrication organization, where we build parts internally that come into our factories.

00:51:32:21 - 00:51:40:29

Unknown

And I have responsibility for the quality organization in fabrication. Thank you.

00:51:41:02 - 00:52:37:29

Unknown

Long does Boeing hold the production certificate? Yes we do. We hold PC 700, which allows us to produce commercial aircraft. And what is the company's organization reporting structure like starting from the production personnel or the manufacturing process? the reporting structure is that for the personnel in the manufacturing process, there are mechanics and inspectors. The mechanics roll up through our manufacturing organization, and report to, in many cases, the

programs, the 737 program, 677787 or the fabrication division, the inspectors are located on a program work with the program, but report directly to me is an independent organization of quality.

00:52:38:02 - 00:52:53:10

Unknown

You please explain the Boeing production process of building an airplane. I, I can and I'd like to pull up, two exhibits if I could, if I could pull up Boeing exhibit one.

00:52:53:12 - 00:52:58:06

Unknown

Yes.

00:52:58:08 - 00:53:24:27

Unknown

Great to to start with an overview. To answer the question, we have three production lines to build our seven, three, seven and final assembly. There are ten flow days. Our first three flow day one, two and three. You will see those only listed once. They are housed together. There are three positions in flow day one three positions and flow day two three positions and Flow day three in a two, all located there.

00:53:24:29 - 00:53:50:22

Unknown

From that point you will see flow. Day four through ten we split into three lines. And for a point of clarity, I will comment that at the time of September 2023, we were running only two lines to build our seven three sevens, the West Line and the Central Line. We were using the East line to pull airplanes in to do Re work, but not in the baseline build of the aircraft.

00:53:50:24 - 00:54:17:10

Unknown

If you could, pull up exhibit two, please, just a little bit more detail of how we build the aircraft. on on hope that was it. Thank you. If we can go back. Thank you so much. inflow day one through three. This is the location where we load the fuselage into that tool. You can see the tool I was referring to there and flowed out one through three.

00:54:18:01 - 00:54:44:10

Unknown

this is where again, in September of 2023, we would do an initial inspection of the fuselage. That has since changed, but we would do an initial inspection of that fuselage and we start to do things like install the blankets, ensure the airplane is ready and start to do the basic work. on the fuselage. When you move to float a four, that is really our joint position.

00:54:44:10 - 00:55:10:04

Unknown

That is where we put the wings on the airplane. The horizontal stabilizer, vertical stabilizer and the gear. That's where it really becomes an airplane, not a fuselage. Then we continue through the process. in float five, we start to load, the back of the airplane interior components. We start to do some ribbon rigging. we make sure our fuel tanks are good to go.

00:55:10:09 - 00:55:33:23

Unknown

Float a six, we turn power on the airplane. That is where we we turn it into a live airplane. We start to begin some of our testing. We really start to build out the interior. float seven is really where we start to do our functional testing throughout the airplane. if I may, Mike, could I ask you to just move that chair out of the way so it has screen.

00:55:33:26 - 00:55:56:06

Unknown

Thank you, thank you. float a seven. we start to do our baseline cabin testing, and our flight control testing that lasts for the next few low days. Seven, eight and nine. We start to test the airplane, make sure our systems are working, and we really finish out the interior build as we get near the end by float a nine, we hang our engines.

00:55:56:09 - 00:56:18:16

Unknown

We make sure everything is ready to go. One two points I will, comment on in this flow that I think are relevant when the when the fuselage is in the tool in float a one through three. That's where we do our initial verification of the rig for this mid exit door, plug on the airplanes that have the plug.

00:56:18:18 - 00:56:35:21

Unknown

And then at the end of the line on flow day nine we do our final fit and fair rig of that plug as well. When the airplane gets to flow. Day ten, we finish up the work and we get it ready to move outside from that factory.

00:56:35:23 - 00:56:41:02

Unknown

You.

00:56:41:04 - 00:57:16:07

Unknown

Was the production rate of the 737 fuselage or airplane prior to the accident? We were we had approved, ourselves to build out a baseline rate of 38 aircraft per month, but we were producing at a rate lower than that, upper 20s to low 30s. And after the accident, we are still approved to produce at a maximum rate of 38, but we dropped our rate considerably lower to the single

digits.

00:57:16:09 - 00:57:30:03

Unknown

And we are now, working our way back up to the 38 airplanes per month. But we are still in the 20s at this point. But thank you, doctor.

00:57:30:05 - 00:57:59:28

Unknown

Miss Linda, you just gave us an overview of shortly before the Alaska Airlines accident and then after. But in the last five years, how has your production rate for the 737 line fluctuated? prior to Covid and prior to the Lion Air in Ethiopia, max accidents, we were producing at a rate on the seven, three, seven line of 52 airplanes per month.

00:58:00:08 - 00:58:39:01

Unknown

after the grounding of the airplane, we, slowed that down virtually to zero. and it has been at a lower rate than that since, coming out of Covid, when the market came back, we were returned to service on the max. We started to, increase that rate again steadily. And as was stated a moment ago, we had been approved to reach 38 airplanes per month, but had not produced 38, airplanes in a given month prior to the Max accident or to date.

00:58:39:03 - 00:59:08:23

Unknown

Could you please describe for us what sort of change management process is Boeing enact? Or to ensure the same level of conformity and safety which each incremental changes? And is that specifically with regard to rate with regard to rate production. Thank you. Yes. We have a a rate readiness process. The rate readiness process is run by the airplane program, who's building the, product.

00:59:08:25 - 00:59:30:00

Unknown

It starts usually more than a year in advance of any given rate increase it. as my colleague Mr. George referred to, we do many of the things that he talked about at spirit, but it is a comprehensive list across the value stream of what needs to be done to increase rate. we asked the questions on staffing.

00:59:30:00 - 01:00:11:23

Unknown

We ask the questions on capital, equipment, tooling, engineering resources. And we have a section at Boeing dedicated to the supply chain where we go out to our suppliers. We ensure and as Mr. George describes, that they too are capable and ready of going up to rate. We have at least monthly reviews in this process. starting about 2 to 3 years ago with the implementation

of our safety management system, we also began to run a safety risk management assessment, for every rate increase so that we could look for hazards, we could understand the risks, a system that is all part of this exercise.

01:00:11:25 - 01:00:43:02

Unknown

And it culminates in a capstone event. I will also comment that as we go through these monthly reviews, culminating in the capstone, we also include the FAA in those reviews. They are welcome to join us. And in my history the last few years, do, attend at least virtually these capstone events and these meetings occur where we ensure that we are ready across the board prior to, approving or authorizing that rate increase.

01:00:43:05 - 01:01:15:09

Unknown

One one other point that was brought up earlier is since the accident, as a part of our ongoing dialog with the FAA and our comprehensive and safety plan, we have established a set of six, key performance indicators, or KPIs that we are using to roll up and indicate, a healthy factory. We have set control limits, per these KPIs, as part of our safety management system.

01:01:15:11 - 01:01:32:27

Unknown

And we watch these control limits and our agreement with the FAA is going forward, these six KPIs and our performance to those control limits will also be an added part of this rate readiness process.

01:01:33:00 - 01:02:01:00

Unknown

And then similar to the question that I asked, spirit since Covid, when your demand did increase, have you ever decided against a rate increase and if so, what were the considerations for that? We have. And in fact, over the last 2 or 3 years, we have decided against them much more than we have decided for them. We delayed the rate, 31 and 38 rates on the seven, three, seven multiple times.

01:02:01:02 - 01:02:20:15

Unknown

The considerations and the primary reasons that we delayed were twofold. Number one was supply chain readiness. The feedback we got from the supply chain, are they ready? And number two was the staffing and training of our own employees and being ready there as well.

01:02:20:17 - 01:02:50:22

Unknown

Thank you, Mr. Cruise. Q. Miss Linda, what are the manufacturing documents, used by Boeing to build an airplane? there there is a set of documents that we use, similar to what was

described, but certainly it starts with an installation plan. The installation plan is, housed in our authoritative system of record, which we call seamless.

01:02:51:18 - 01:03:16:00

Unknown

the common manufacturing execution system, I believe spirit referenced is just, yes, we are. yes. But it is our common system of record. That is where our installation plans are housed. They reference, set of drawings. they reference the KPIs, which are the processes we use to manufacture under and specifications as well, which give engineering guidance.

01:03:16:19 - 01:03:47:26

Unknown

and then there is a set of documents that we use like non conformance records, as were mentioned earlier, when there is a nonconforming condition that needs to be documented as well. Can you please describe the Boeing production document hierarchy? our document hierarchy, is authoritative. Documentation is which are those documents which our employees work to.

01:03:48:01 - 01:04:11:15

Unknown

Those are those housed in CMOs? They are the installation plan, the drawing, the documents that we must be able to pull up to meet the codified federal regulations. as we as we build product from a quality management system, we have our, quality documentation, which is developed to ensure that we also comply with all of the CFR.

01:04:11:15 - 01:04:29:26

Unknown

Is there, hierarchy there really starts with the CFR says our quality manual. and then our policies process KPIs, and process guides as you work down that hierarchy.

01:04:29:29 - 01:05:03:11

Unknown

Boeing production documents show that there are inspection points in the manufacturing records. How and who determines these inspection points. The inspection points are, decided similarly to, as this was described earlier by engineering, by our planning organization, by our, manufacturing or quality teams, as the case may be, but we have a, we have we have an abundance of processes.

01:05:03:16 - 01:05:34:03

Unknown

We have a process that lays out the fundamental guidance for how that happens. and we follow that guidance as well. All right. Similar to the question that I asked, spirit, what is the difference between the inspection accomplished by a Boeing manufacturing personnel versus a, Boeing

quality inspector? the the inspector role at Boeing, like, at spirit are those who do an inspection.

01:05:34:11 - 01:06:02:14

Unknown

when, when employees do their work, they place a stamp, the stamp, the authoritative media, the stamp, as I like to call it, is the document that an employee places that says, I've done my work. Manufacturing mechanics typically stamp their work, stating that they did it in compliance with the requirements. When they build it, an inspector stamps their work, stating that they have inspected it.

01:06:02:16 - 01:06:31:04

Unknown

Is there a training or certification needed? In both cases, there are certifications required for both mechanics and inspectors for certain activities. but as was described, there are different job skill codes and different job skill codes perform different functions. An inspector is a different skill code than a mechanic. They are trained in those skills. we certainly recently have done a great deal of enhancement to that training as well.

01:06:31:04 - 01:07:01:23

Unknown

But we train them in those skills and for certifications for specific jobs or activities, they are provided those certifications when required as well. And and how often does Boeing review its processes and documentation, in particular its KPIs, to ensure coherence and clarity, we have a process document that ensures that we review every BPI no longer than every five years.

01:07:02:29 - 01:07:30:24

Unknown

there are some that we do every three years, and certainly we do them more frequently. If there are, suggestions that there's something missing. findings, concerns within that come up within Boeing or that come up, an audit, either internal or FAA or whatever it may be. We are just more frequently, but every BPI will be reviewed, no longer than every five years.

01:07:30:27 - 01:08:12:00

Unknown

In each of the sections of the BPI, there's a specific two roles affected that BPI what is Boeing? What is Boeing's expectation when it lists these roles? our expectation is that for any BPI, that the employees whose roles are affected will be following the requirements of that BPI specifically, let's say, it's a, summary of the people in their roles who would need to go to those KPIs, become familiar with those KPIs, and ensure they are, following them in each of these roles.

01:08:12:00 - 01:08:18:12

Unknown

Flag an issue in the production process if it was necessary.

01:08:19:13 - 01:08:33:21

Unknown

each of these roles absolutely could flag an issue in the production process. And, and, people beyond just those roles, it can also flag an issue if they see something wrong in the production.

01:08:33:23 - 01:08:58:24

Unknown

Please describe the process for identifying a BPI that needs to be revised, the revision process, and how are these audited. And obviously you already said there are set schedules to when they're being revised. But when we find that a BPI needs to be revised for whatever reason, there is a BPI owner, that BPI owner is responsible for the content of that.

01:08:58:24 - 01:09:37:10

Unknown

BPI we proposed the revisions. We sent it out to a group of employees, depending on what the BPI is, sometimes we have a workshop, sometimes, there will be a team that is formed to work on it. Sometimes an individual can make the changes, but it's routed for comments. We also now have a approval panel within the quality organization that if there are significant changes to that BPI, it comes to the leadership team to also review that BPI and then in many cases, the contents of these BPI are actually approved by the FAA.

01:09:37:13 - 01:10:00:15

Unknown

So after Boeing is comfortable with what we would like to propose, we then send it to the FAA for their review and approval as well. and after all approvals are granted, it, it goes into effect. So basically you you saying that you do solicit feedback from manufacturing personnel when the BPI is need to be revised? Is that correct?

01:10:00:21 - 01:10:07:26

Unknown

That is correct.

01:10:07:28 - 01:10:38:16

Unknown

Mr. Kaplan, can you please, before I ask you a follow up question to Miss Lund, can you please tell us what your role is, responsibilities for as an IAM business representative? I'm a business representative in Everett, Washington, for the International Association of Machinists and Aerospace Workers, and we represent the members who are on the floor, who are building the airplane, inspecting the airplane, often usually to our collective bargaining agreement.

01:10:38:16 - 01:10:46:10

Unknown

But we're often engaged in conversations about things that are happening on the floor as well.

01:10:46:13 - 01:11:11:14

Unknown

Would you care to comment on Miss Lund's answer with regards to soliciting? feedback from Manufacturing Personnel Group with regards to BPI revisions? Yeah, there is a process. when you get into the system that stores all the BPI pros and policies, there is a group of people who do perform writing reviews on each change to each command media document.

01:11:11:16 - 01:11:34:04

Unknown

But these are not people that are on the floor. They are people that are selected from manufacturing, from quality, quality engineering. these are not people who are down working on the airplane, building the products, being forced to, are being required to follow the product. The processes that are defined in the command media document.

01:11:34:06 - 01:11:43:04

Unknown

And our enhancements to the process made. And how is it filtered down to the production personnel?

01:11:43:06 - 01:12:24:13

Unknown

Enhancements to the process are made through the revision process. Okay, I just described. If you have another question I'm happy to answer it. and it's filter down. We have a weekly summary at this point that is, flowed out to employees letting them know what's changed during the week. I, I will comment that enhancing that process is one of the areas that we are working on as part of our improvement plan, as we've looked, tried to look very broadly at areas that need improvement, things we've heard from our employees that need improvement, that is an area that needs improvement.

01:12:24:13 - 01:12:35:24

Unknown

And we are working on, ways to improve that and collecting feedback from our employees about ways that would be more effective to communicate those changes.

01:12:35:26 - 01:13:09:22

Unknown

And a discrepancy or defect is found in manufacturing. How is it recorded and tracked and when a discrepancy is found, it is recorded on a non conformance record. there are several times for the, sake of simplifying but, but generally capturing it, there are two kinds. There is a non conformance record which does not require a disposition as Mr. George described, where or I'm

sorry as Mr. Gray described where a part can be brought to its drawing configuration.

01:13:09:22 - 01:13:38:29

Unknown

We sometimes call that a pick up. You may hear that word here. Those terms, are sometimes used interchangeably. And then there is a disposition required and or where the part cannot be brought back to its original configuration for drawing, at which point we go to engineering. We'll get a disposition on that part to ensure that the, steps that we take to repair it are, conforming, compliant and safe engineering definition.

01:13:39:01 - 01:14:07:15

Unknown

I would like would you like to add to that? Yeah. No, she's correct. We have we have multiple different types of non conformance. We've got the lowest level non conformance which is a general pickup which you can return the airplane to condition without an engineering disposition. And then there is the engineering disposition tag that requires engineering to give us a rework instruction on how to return the airplane to a condition.

01:14:07:17 - 01:14:23:05

Unknown

It's never going to return to a drawing condition, but it is a disposition that allows us to continue building the airplane. It's in the non conformance management arena.

01:14:23:07 - 01:14:28:26

Unknown

And how are out of sequence production tasks handled?

01:14:28:28 - 01:14:55:05

Unknown

So is there a specific procedure or process to ensure the production steps aren't missed? out there there are a few different ways. But in general, when a job record, when an installation plan is fired, which means it is due, it's come up on our team, a system. It's, a work order is fired for us to build the aircraft.

01:14:55:07 - 01:15:29:07

Unknown

When that is not complete, that stays with the aircraft record that paperwork stays open. And, as we proceed through the build, we ensure that all paperwork has been accounted for. in terms of out of sequence work, I, I want to hit a couple of items there. We have a, a BPI for travel work, for which, it primarily describes the requirements for traveling work.

01:15:29:07 - 01:15:54:07

Unknown

Once you leave the factory and you were to go to the ramp, we operate by that BPI and have traditionally, in our factory, we have also had what we call a precedence network or a precedence network of critical jobs, which we watch, and we make sure that this president network, that the critical job prior to another job is complete, prior to, starting to work on that job.

01:15:54:07 - 01:16:27:22

Unknown

And we use that precedent network to also help us manage, out of sequence work. Lastly, I will state, since the accident, we are significantly changing how we manage travel to work. So that is what I would call pre, 2024. since the accident is a part of our improvement activity, we are implementing a process where we are using, safety risk assessments through our safety management system to assess work when it travels out of position to ensure that we have a plan to work it, that it can be worked.

01:16:28:00 - 01:16:54:12

Unknown

from a product safety and a personal safety standpoint safely, we identify how many positions in the factory floor it could move before it could create a safety issue or cover up work, or increase out of sequence work. We, do that and then we manage to that. And and again, that is just an implementation. but but we are having good results from that so far.

01:16:54:15 - 01:17:12:15

Unknown

Q you mentioned that, all the production records are kept in seamless. What is Boeing's record retention policy for all these records? some records are required to be kept for life of airplane. Other records are to be required to be kept for, I believe it's one calendar year plus ten years. So slightly more than ten years.

01:17:12:15 - 01:17:35:21

Unknown

There are record requirements and and we abide by all of those depending on the various pieces of, records. Thank you. Counsel. All right. my questions again. Go back to 20, number of 2023. So as you said in response, Miss Lund, what is a ship side tracker. Ship side action tracker, sometimes also referred to as fat.

01:17:35:21 - 01:18:04:08

Unknown

So if you hear that that's the acronym S80 that we use for ship side action tracker, that's that system is fundamentally a communication tool. Next to areas of the airplane. We have what we call a line side support center or an LSC. C there are cross-functional representatives who sit next to the airplane. Their job is to, assist the folks building the airplane and inspecting the airplane, the the managers, the mechanics, the inspectors, the fulfillment team.

01:18:04:08 - 01:18:33:24

Unknown

When they need help, they use the SAT in order to help communicate. So if a mechanic were to need something, he could go to the LCC and put it in SAT. And it communicates to different functions if they need a part, if they need engineering support, if they need supply or support. It is a communication tool used to let people know when the floor needs help or needs something.

01:18:33:27 - 01:18:47:12

Unknown

That's a follow up. Who initiates the SAT? A SAT can be requested by anyone on the floor, typically at someone in the line side support center who writes the set.

01:18:47:14 - 01:19:21:29

Unknown

Who is able to update the SAT? I believe it's typically, again, the people in the line sight support center or those who are working in the SAT system. For Boeing procedures is the SAT, ship side action tracker considered an official production record for the airplane? Please explain. A that is a communication tool. It is not what we call the authoritative system that does not authorize an employee to work on an aircraft that, as I mentioned, request help.

01:19:22:01 - 01:19:44:29

Unknown

It lets people know if we need them to come to the airplane. It lets them know what's going on. It allows us to elevate issues so management can get visibility, can come and help when appropriate or reprioritize work. It does not authorize work on the airplane. So in that way it is not an authoritative system that is done through CMOs.

01:19:45:01 - 01:20:10:22

Unknown

And gears, could you please explain the mid or the mid position, the different configurations of a door that are possible on A737-9 max? Yes. Where there's a the mid exit door plug, the you configurations, you can have a working door in which the door is installed. It works just like a door that you see on an aircraft with a handle.

01:20:10:22 - 01:20:35:16

Unknown

And it can be open and closed and is intended to do that on a regular basis. Or if, an airline does not want that door, they can have a plug, the structural mid exit door plug. So on the fuselage side, the cut out for lack of a better word, the design, the opening for the door will remain in the fuselage.

01:20:36:09 - 01:20:57:18

Unknown

the plug acts as a structural element to close that. So when you look at it from the inside of the aircraft, you'll see nothing there. It's not intended to open. So the rows and the interior. So which bins and things can continue right through that. If it's a door, you obviously have to have an opening for people to exit, for that door to be opened, etc..

01:20:57:20 - 01:21:28:26

Unknown

So you can have a structural plug, or you could have a working door. Is the medi plug considered primary structure? I, I will only pause on the word primary. It is considered a structural element of the aircraft. What does it mean to be a structural element to the airplane? a structural element of the aircraft means that it is intended to carry, structural loads.

01:21:28:28 - 01:22:01:10

Unknown

It is intended to, operate as a piece of structure, not as a moving component. but it is intended to be a part of that structure of the fuselage. I did Boeing introduced the med plug option on the 737-9 Max. I was not on the program, at the time, so I, I will start by saying it was originally designed and implemented on the 737 engine.

01:22:01:13 - 01:22:26:07

Unknown

That design was carried over to the Max, but it was introduced on the engine, I believe, around the 2009 timeframe. I believe it was introduced, because some of our customers wanted to carry, enough passengers that we needed another exit door to meet the requirements. You have to have so many exit doors, so many such a distance apart.

01:22:26:20 - 01:22:58:11

Unknown

in order to meet the evacuation requires performance of the FAS. We had customers who wanted to carry more passengers. There was another door that was needed. I believe that was the original purpose of that door. And then there were other customers who came back that did not want that door. So the design solution was, keeping the baseline fuselage design similar and then allowing a customer to either have a working door or a plug, depending on the configuration they were choosing.

01:22:58:14 - 01:23:28:29

Unknown

It was traveled work to find that Boeing traveled. Work is defined as work that does not get completed in the position in which it was originally intended to do so. If we fire a work order for a job to get completed in day three and it doesn't get completed in flow day three and remains open, that would be considered traveled work which had traveled to Florida for.

01:23:29:02 - 01:24:02:01

Unknown

And you describe how the rate of travel work has fluctuated over the last decade on the 737 production line. they traveled work historically through through my experience with Boeing. has gone up and down, periodically through the years. And that is, something that I've seen repeatedly through my history. the 737., represents that as well.

01:24:02:03 - 01:24:16:04

Unknown

There are times when travel to work will go up somewhat, and there are other times when it comes down to a very low level, but again, very much as Mr. George described it, for spirit.

01:24:16:06 - 01:24:23:15

Unknown

To please, describe to us the BP 1581 removal process.

01:24:23:18 - 01:25:08:09

Unknown

P 1581 is our Boeing process instruction guide that, talks about the need to when, the need comes up to remove any, parts from an airplane, a job which had been previously completed, a part that is installed and stamped off on an airplane needs to be removed or whatever reason or condition. B.P. 1581 is a the documentation that gives the processes and the requirements in order to remove that part, where simply is this BPI used that process used across all Boeing production facilities.

01:25:08:12 - 01:25:43:18

Unknown

It is Boeing Commercial Airplanes and I can speak for yes. What is the formal training given to a manufacturing personnel is allowed to write removals. And again remember this is September of 23. Thank you. in September of 23, the primary training that would have been given initially would have been the on the job training for an employee who comes into a role, would be trained on the job when they needed to do that work.

01:25:43:21 - 01:26:18:21

Unknown

And then to supplement that, particularly as it relates to removals when when an issue was seen or something is happening, we will also issue quality alerts. And to that there had been several quality alerts related to BPI 1581, which would supplement an employee's knowledge or a reminder of that, BPI okay. back in September, was there any recurrent training for personnel removals?

01:26:18:23 - 01:26:58:15

Unknown

There is recurrent there is training for BPI 1581. there is an initial training for BPI 1581 that people needed to take. as of September of 2023. The best of my knowledge, there was not recurrent training. There is now. What is your overall assessment of BPI 1581?

01:26:59:08 - 01:27:25:19

Unknown

at the risk of giving an opinion and not a factual statement, but I think it's fairly factual. I would say, it is detailed. There was a lot of data, and it is complex. as a part of our initiative to simplify much of our command media, BPI 1581 with removals has its very own element of our comprehensive plan.

01:27:25:22 - 01:28:08:24

Unknown

It's, it's a sub swim lane all its own. because we know we really do need to simplify that. BPI. Okay. Thank you. Mr. Catlin, what is the IAM role in the ER in the aircraft manufacturing process at Renton? Our members who do the manufacturing and the quality inspections on the airplane from the beginning to end, many IAM workers are there in the Puget Sound area for Renton in Renton alone, I think we're at about 11,000.

01:28:09:04 - 01:28:35:14

Unknown

throughout the IAM in Puget Sound, we're about 33,000 members. And how many IAM members are FAA airframe and or power plant certified? I do not have that number. You know, if there are certain job groups that require an FAA certification and P to be in that group. There used to be, our EMTs aircraft maintenance technicians, aircraft maintenance technicians, inspectors used to.

01:28:35:14 - 01:28:40:29

Unknown

But that requirement went away several years ago.

01:28:41:11 - 01:29:10:24

Unknown

what does the IAM do to help new members be successful in aircraft, in the aircraft manufacturing process at Boeing? Well, currently we are in the process of, starting our machinist institute, where we will be providing some, pre-employment training. We refer to it as red light green light training. but at this, at this point in time, we do have one center open down in the Seattle area.

01:29:10:26 - 01:29:21:21

Unknown

The training of employees for the BCA Quality Manual, section 7.1.2 is the responsibility of the Boeing Company.

01:29:21:24 - 01:29:51:07

Unknown

Does the IAM promote safety to its members at Boeing? Well, we have and we have, through our joint programs, we have, several different processes that we have we've we've implemented this year process that allows employees to, you know, working with Boeing, allows them to implement safety issues, concerns that get elevated up through management. We have article 16 or collective bargaining agreement.

01:29:52:01 - 01:30:21:19

Unknown

we also have entered into the, the tripartite agreement with the Boeing Company, which is part of the speak up process. And when our members have concerns about safety, air quality on the airplane, they can file speak up report, which goes to the team, gets evaluated by regulatory quality systems oversight. then goes to our members on the tripartite agreement, has visibility with the FAA as well.

01:30:22:21 - 01:30:44:15

Unknown

have you ever or what do you know about the SAT system at Boeing? That system is a system that I've used several times, many times throughout my career at the Boeing Company. It's a communication tool. depends on what the issue is. as a quality inspector, I often ran into planning errors on installation plans. some of them would require manufacturing, engineering.

01:30:44:15 - 01:31:09:27

Unknown

Some of them would require quality assurance planning. I could write a SAT to get me engaged in addressing the planning error on the IEP. quality assurance planning use. a different process. But, if manufacturing needs a part, they would write a SAT. it's literally a communication tool. It has no authority to, change the configuration of the aircraft.

01:31:09:29 - 01:31:36:01

Unknown

Is it an effective tool, to get the help needed? Absolutely. But what type of training do I am personnel receive regarding the use of is in the production process, very little. in our, initial training, there is some discussion about it, but there's no official training to how to access, the system, which is referred to as 1 p.m..

01:31:36:03 - 01:32:14:04

Unknown

That's where all of our command media documents are stored. very little training on anything about the BPD. there's not a lot of training you will find in the IEPs. There will be references to a BPI. but prior to back before 2017, we we had something called required reading. And every

Friday we would get a notification in our email saying that there has been a change to a BPA policy or a pro, that would affect our organization, and then we would have a requirement to go in and review those changes.

01:32:14:04 - 01:32:39:02

Unknown

And then we would have to acknowledge that we have reviewed them 2017 that stopped them before it became recommended reading. And then that kind of went away. And now we're down to in the North Plant up in Everett. We see tip sheets down in the south in the Renton plant. we see quality alerts, but other than that, there's nothing that really tells our members when a BPI has changed.

01:32:39:04 - 01:32:56:21

Unknown

And when you look specifically at BPI 1581 since October of 2010, that BPI has changed 335 times. It went from 28 pages to 58 pages, and nobody really knows what those changes are.

01:32:56:23 - 01:33:22:09

Unknown

What does the IAM tell its membership to do if it finds a issue with the BPI? Usually it's reported put in a speaker. That is one of our only avenues. You can take it to your manager, you can take it to the like, but if you want to drive action, you can put it in either through a SAT or you can report it up through speak up, and then it will usually get addressed.

01:33:22:12 - 01:33:44:12

Unknown

Does the IAM promote, promote the criticality of manufacturing and aircraft to its membership? well, we do it through number one in our, on our onboarding, we have our opportunity to meet with every new hire that's going to come in to the IAM on day one. we have a conversation with them about that point, and then we hold our local large meetings.

01:33:44:12 - 01:34:13:10

Unknown

We have, you know, communications with them, but we don't have an arena, where we are participating in Boeing training, where we are an active participant in any of these. most of the training is falls on the responsibility of the Boeing Company through their quality manual. Okay. Thank you, Mr. Cruise. can I can we just break for a second?

01:34:14:01 - 01:34:37:15

Unknown

so we are going to take a ten minute break. Ten minutes. Good ten minute break. We're going to break. And. Well, actually, I'll leave it to 1105, a little more than ten minutes when we come back, we're going to come back to the technical panel. one thing I want everyone to do, see

where my microphone is.

01:34:37:15 - 01:35:01:06

Unknown

Right in front of my mouth, right. Don't be afraid of it. Come right up to the microphone. And here's why. It's not just because we have people in the room. We've got fans back here, you know, but people online. Thank you, Gail, for emailing me. I cannot hear. And so they are straining to hear. This is we are a very transparent agency.

01:35:01:06 - 01:35:24:27

Unknown

We want people to be able to follow along. And it's not just witnesses but also the technical panel. So and we're also standing up here. So right here is your microphone. Don't be afraid of it. Talk right in. Speak up okay. And then for the camera there is a request to see name tags so people can see who's speaking.

01:35:24:27 - 01:37:57:24

Unknown

If they're remote. So if we get back that up a little bit so that people can see name tags and follow along on who is speaking both on the technical panel, the witness table and amongst the parties. We want to make sure that everybody can participate whether they're here or not. So thank you. We will be back at 1105.

01:37:57:27 - 01:49:32:02

Unknown

P.

01:49:32:05 - 01:50:09:00

Unknown

To 106. If folks, on the technical come back, the witnesses are, very busy. Thank you.

01:50:09:02 - 01:50:46:11

Unknown

Mr. Cruz, I'm going to let you three ready. Thank you, Madam Chair. this from Mr. George. Mr. Brookside, who will answer these, specifically? Sure that there are two who wires seven, three seven, four years. the two there will be one rising. the peace open is.

01:50:47:07 - 01:50:53:29

Unknown

fully under.

01:50:54:01 - 01:51:28:12

Unknown

Okay. the spinning supplier, suppliers. The wanted the Wichita factory. You know, room. Yes. So 147. the wiring, that's done on the seven, eight, seven associated with the floor grid is done by a third party from. But that's pretty unusual. And from there, if mainly if we have a quality issue, for example, then we'll invite the supplier in to, to help, I guess.

01:51:28:12 - 01:51:52:29

Unknown

What types of controls can you can you all hold for a second? Whoever's back there at the door, if you could close the door or come in or leave and take your conversations outside. Thank you so much. Continue on. I'll ask you to ask the question again. What types of controls are in place for the supplier work and who is responsible for their work?

01:51:53:02 - 01:52:14:13

Unknown

Well, our supply chain organization is responsible to manage the supplier. they are responsible for their work. generally, if it's, if it's a non conformance, for example, that they're in our factory, repairing.

01:52:14:15 - 01:52:40:13

Unknown

And what types of audits of spirit conduct on, on the suppliers on how often there's a done audits relative to them working internally with us. Yes. I don't know that we have any audits. relative to that, I can say it's very unusual for a supplier to be working within, the four walls of separate.

01:52:40:15 - 01:53:08:02

Unknown

Madam chair, I, I guess I just want to clarify the question. Patroller. Are you talking about, audits that we conduct on the suppliers themselves at the supplier facility? no, it's basically suppliers within Wichita. The plant itself. Okay. Thank you. Yeah, I think I answered that. Okay.

01:53:08:04 - 01:53:16:18

Unknown

So how many supplier auditors is the spirit? Have?

01:53:16:20 - 01:53:39:12

Unknown

We have a supplier audit group, and I'm going to just throw out a number here. It's it's, 30 or 40 in terms of spirit personnel that conducts that. Is there a certification or training for this, for these personnel to be auditors? Not that I'm aware of.

01:53:39:14 - 01:53:46:03

Unknown

So how would the heart of auditors work plan determined by spirit?

01:53:46:06 - 01:54:15:15

Unknown

Again, are we talking in the now we're talking in the supply base or basically your spirit auditors that look at, your suppliers themselves? I think I can take that one there. so spirit spirit audits. It's. Can you hear me? Okay. Yeah. Okay. Spirit audits its suppliers. we have we have a like like Terry mentioned, the supplier quality audit team.

01:54:16:03 - 01:54:55:18

Unknown

they regularly go out to the suppliers. They'll be onsite with the suppliers looking at their processes and procedures. we we regularly audit suppliers similar to how how Boeing will come in and audit, spirit. So looking at, looking at, the scope and scale of the supplier and looking at their procedures depending on what they're delegated to do, some delegator, some suppliers can be, have delegated inspection, for instance, at which point will perform audits on their, inspection processes and procedures.

01:54:55:20 - 01:55:03:12

Unknown

Is there any communication then, with Boeing with regards to some of your audits?

01:55:03:21 - 01:55:27:06

Unknown

can you expand on the question? Yeah, I mean, it. So during your findings in these audits, is there a reason or is there a tool or communicated between Spirit and Boeing with regards to some of those audit findings? generally only we only refer those findings back to Boeing. If there's been an, an escape of some kind through one of the suppliers.

01:55:27:09 - 01:56:07:07

Unknown

Otherwise it's, it's Spirit's oversight of the supplier. Does that answer your question? Yes. Thank you, Doctor Woods. Thank you, Mr. Ackerman. I believe you're the only one who hasn't had an opportunity to tell us about your roles and responsibilities as the VP of Supplier Quality. Would you please do so now? I thank you for the question. I did cover my roles and responsibilities, but just to reiterate, I do have, responsibility for all of the parts, whether it's our external supply chain, and overseeing the suppliers or our internal fabrication division.

01:56:07:09 - 01:56:41:03

Unknown

Thank you for that. So for BCA, approximately how many suppliers does Boeing have? it varies over time. But roughly speaking, we have about, 1200 active suppliers right now. And similar to the questions that we presented to spirit about how many supplier quality auditors do

you have within the organization? I have about 200 auditors that are distributed around the world, under an organization that I have the supplier facing, I have a team, that covers, Europe.

01:56:41:05 - 01:57:02:18

Unknown

I have two different teams that cover North America. I have a team that covers, Asia and Southeast Asia. And do these employees have any sort of specific training or certification that they need to be in order? They do have training on their auditor function, a supplier quality representatives? Yes.

01:57:02:21 - 01:57:25:22

Unknown

For certification purposes, is there any sort of certification that they require? But I don't believe there are specific certifications. with the exception of we have a group that oversees, special processes, things like anodizing or, nondestructive testing. And I believe they do have certifications. And is the training a one time thing, or is there recurrent training?

01:57:26:01 - 01:57:32:25

Unknown

there is both onboarding training, and then there is recurring training.

01:57:32:28 - 01:57:59:23

Unknown

You generally describe for us what type of audits Boeing conducts on its suppliers. There's a variety of different audit tools. We use. typically there is or one common tool is a quality management system audit. it's in some way similar to an audit to the S 9100 standard, but it's evaluating the, the internal procedures and policies of the supplier and their adherence to those policies.

01:58:00:02 - 01:58:21:28

Unknown

but we also have tools that are more part specific. So we'll do, an audit of the production of an, an individual part, at a supplier, or we'll do a manufacturing process audit where we take, a type of manufacturing process and audit the, the production of multiple parts that go through that process. And what sorts of timelines are you considering?

01:58:21:28 - 01:59:03:04

Unknown

Is it quarterly? Yearly? Monthly? we do have, each supplier quality representative has a region, and they'll touch each one of those suppliers, at least annually. But typically more than that. it is, somewhat risk based today where we see the, or we see a particular set of risks that that would warrant more audits, as part of the comprehensive plan or moving to a more structured oversight, or we have, more forward looking data that comes into our systems and evaluation,

system and then, a more risk based, driven, engagement with a supplier.

01:59:03:11 - 01:59:18:22

Unknown

and I should add and then there are, some suppliers, where we have a full time on site presence, typically major structure suppliers. there are some other facilities where we do have full time presence.

01:59:18:25 - 01:59:39:18

Unknown

How are the results of these audits communicated and to whom are they communicated to throughout the Boeing Company? so the audits would if there are any findings as a result of an audit that would get documented and submitted to the supplier in the form of what we call a service of a supplier evaluation request, we log all of those servers.

01:59:39:18 - 01:59:55:18

Unknown

So we see internally in our data systems where we have repeat findings that a supplier or where we have an audit that, would indicate a higher level of risk and indicate future action is needed.

01:59:55:20 - 02:00:18:19

Unknown

Along that same vein, what controls are in place for your suppliers to ensure that they're adhering to Boeing's quality standards? I would say that the primary, control is, is those audits, where we go out and do those evaluations at the supplier. But we also look at a broader data set, for all of our suppliers.

02:00:18:19 - 02:00:39:20

Unknown

We look at a defect rate, we look at, Scott described earlier note of notes, of escape. We look at notice of escape rates, from suppliers. We look for trends, in that data that would indicate additional oversight, responsibility or escalation with a supplier as required.

02:00:39:22 - 02:01:05:29

Unknown

Prior to the accident occurring, how often was Boeing auditing spirit, for instance? spirit is one of the suppliers where we have, full time on site team. we have about, 15 people, I believe, that are dedicated to an audit function. that was that was prior to, both the accident and the manufacture of this fuselage.

02:01:06:02 - 02:01:32:05

Unknown

So it's roughly on a it's roughly on a two week cycle. And has that changed since the accident?

we we have brought additional auditors in. we also support, ongoing FAA audits at spirit as well. You said additional auditors, but has the rate of audits also increased? I don't think the rate of audits, has increased.

02:01:33:25 - 02:01:39:02

Unknown

since the accident. No.

02:01:39:04 - 02:02:14:24

Unknown

Prior to the accident occurring, eye level, what sorts of issues were the auditors finding with their audits? The spirit. The frequent types of audit findings we were identifying and writing up were, things like, control of FOD, foreign object debris, tool control, protection of parts, and, compliance with manufacturing plans, where I'd say the most common.

02:02:14:26 - 02:02:41:21

Unknown

Accessibility to, manufacturing plans. That would be a better way to frame it. And has the rate of supplier generated defects changed over the last five years, and if so, how has it changed? You were to look at a five year window, specific to the seven, three seven fuselage or broader than that, specific to the 737? we have seen, ups and downs in the data.

02:02:41:21 - 02:02:55:11

Unknown

We saw, some elevation going on in late 2022, going into 2023. And we started taking, escalation steps as a result of that.

02:02:55:14 - 02:03:29:13

Unknown

What do you mean by escalation steps? we started, with increasing the size of the team we had on site. it was in about, May or June of 2023, that I put, a senior director on site to have a supplier quality executive, lead the team there. we started increasing the team, and then in May of 2023, we started introducing Boeing inspections, where we would actually do inspections in the spirit production system.

02:03:29:21 - 02:03:42:18

Unknown

we identified some specific areas based on, risk assessment that we did at the time, and we did that risk assessment concurrent with, spirit, particularly spirit engineering.

02:03:42:20 - 02:04:17:15

Unknown

Thank you. To spirit. Mr.. George, can you please describe how your workforce demographic

has changed over the last decade or so? And by demographic, I specifically mean experience, prior experience in manufacturing, skill, longevity with the company, that sort of thing would characterize it. five years ago, before 95%, 95% of the the folks that we brought in had sheet metal experience in assembly.

02:04:18:23 - 02:04:48:29

Unknown

now it's it's completely opposite. It's, you know, 5% of the folks that we bring in have sheet metal experience. Therefore, over that same time period, we've gone from a two week training to currently we have a 6 to 8 week training, again going through, blueprint rating, work instructions, how to drill, how to install a faster sealant, those type of things.

02:04:49:01 - 02:05:01:27

Unknown

What kind of assessments or safety risk assessments has spirit done on how these changes in your workforce have affected quality control?

02:05:01:29 - 02:05:26:24

Unknown

You know, we're in the very beginning of our ASM mass journey, and I think that that would capture it, for the most part, other than that, we we haven't done much of a risk assessment relative to the, the tenure of our sheet metal mechanic.

02:05:26:26 - 02:05:41:20

Unknown

Outside of extending the training by several weeks, have there been any other mitigations that spirit has put in place to try to bridge that gap between experience and skill that you're seeing today?

02:05:41:22 - 02:06:14:06

Unknown

But specifically, again, we we, we try to launch countermeasures relative to things like bar charts, which is specific instructions, breaking the work down to the simplicity that we can, and then working with, each of the, the mechanics and the line side teams, which we have that, as well as Boeing working with each of the teams to better understand their defects, root cause, and then corrective action plans associated.

02:06:14:08 - 02:06:30:15

Unknown

Can I can I just add to that a little bit? one of the things that we have done is we've we've brought in what we call workplace coaches. these are generally retired, mechanics, who've done that type of work before. they don't they don't want to come back as full time, but they will they will come back in.

02:06:30:16 - 02:06:40:22

Unknown

They will oversee some of the build, some of the IPAs that they were familiar with when they when they built the product.

02:06:40:24 - 02:07:05:25

Unknown

Who is ultimately responsible for training spirit personnel to work on Boeing products, both in Wichita and in Renton? We have a core training group in Wichita that is responsible for, training our personnel, and it would be for both the folks in Wichita and, Renton.

02:07:05:28 - 02:07:12:24

Unknown

Or any spirit employees required to have certifications to perform work.

02:07:12:27 - 02:07:39:09

Unknown

Yes. again, you know, we're we're kind of mainly talking about sheet metal mechanics and seven, three, seven, but I have a whole fabrication division. we have, inspection to where everything from nondestructive inspection, certification, and then to the higher levels of a mechanic, relative to, certifications for them.

02:07:39:11 - 02:07:46:16

Unknown

Would you please give us an overview of what types of training are recurrent?

02:07:46:19 - 02:07:50:20

Unknown

Well, we have,

02:07:50:22 - 02:08:18:10

Unknown

Pretty much everything. So I'd start with, we have online training, training system. So periodically, every employee, there's, there's, a, a term in there that, they will train every six months, etc., depending on what the training is.

02:08:18:12 - 02:08:26:25

Unknown

How often is your training audited to ensure that is producing the results that you want?

02:08:26:28 - 02:08:53:05

Unknown

I think it would be more of an internal audit. I don't know that we have anything formal, but we, we obviously are in constant communication with our training leaders and the activity on the floor and how the the latest group that just went through training and how they're performing, etc..

02:08:53:07 - 02:09:06:02

Unknown

And then my last question on this subject is do spirit production personnel in Wichita require any sort of special training or certification to install a med plug?

02:09:06:04 - 02:09:16:00

Unknown

But, no, not specifically.

02:09:16:03 - 02:09:51:21

Unknown

Going back to Boeing, please, Miss Lunn, can you describe your workforce demographic? And again, to reiterate by demographic, I mean, experience, prior experience and manufacturing skill, longevity with a company, that sort of thing, and how it has changed over the last decade. Yes. similar, to Mr. George. prior to Covid, we, had a, a experienced workforce, which we still do, but a more experienced workforce.

02:09:51:21 - 02:10:19:14

Unknown

And when we were hiring new employees, more of our new employees, most of our new employees had some aerospace experience. We would hire them from the military, we would hire them from MRO, or even a technical school. But someone who had some training, in the aerospace coming out of Covid, when we really started ramping up our hiring, we had had quite a bit of attrition.

02:10:19:14 - 02:10:54:21

Unknown

The 2020, the year during Covid, when we came out of that and started ramping up, our, staffing, we found that considerably more of our employees did not have that aerospace experience or applicable experience in the job. And, the, the both the number of employees that we were hiring and the, lack of experience, I would say, really, started that demographic shift.

02:10:54:23 - 02:11:24:00

Unknown

What kind of change assessments were made, considering that difference in what you had previously in terms of experience and skill, and then what you have now? we we recognized, by the end of 2022 and even had our risk assessment, recognizing that we had an issue in, in, in 2023, we went back and tried to enhance our training program.

02:11:24:00 - 02:11:47:01

Unknown

We did enhance it. our training program has two fundamental elements to it. The first is what we call our foundational training center. That's more what I'll call our classroom training, our initial training. When you come into the company. And then there's an on the job training that you get when you're down on the floor. we enhanced our foundational training in 2023.

02:11:47:03 - 02:12:14:02

Unknown

We made improvements. but quite frankly, what we heard from our workforce loud and clear. this year when when we began our quality and safety standards is that we had more work to do. And since that time, starting with this year, we have made significant enhancements both to our foundational training as well as to our structured on the job training.

02:12:14:04 - 02:12:47:25

Unknown

Are there any other controls or mitigations that you have put in place besides training to ensure the bridge between that experience and the current skill? Yes. And so, we'll start with training because that's important. In our foundational training, we have added over 300 hours of curriculum. We have, gone back and really overhauled the curriculum. We've added significant elements on the safety management system, the importance of safety and being an aerospace mechanics.

02:12:47:25 - 02:13:12:15

Unknown

We've started there. When it comes to on the job training, we've really moved to what we call now structured on the job training with several elements. We have an electronic dashboard. We track every employee. Every employee is assigned a peer mentor on the floor when they leave for structured on the job training, we no longer allow employees, mechanics, or inspectors to stamp jobs.

02:13:12:15 - 02:13:31:15

Unknown

We don't give them any authority in schemas. As discussed earlier, the stamp jobs until they've successfully completed structured on the job training that involves things like you have to have done the job you're going to be doing. x number of times on the three seven. That's a minimum of ten times for each job you're going to do with a peer mentor.

02:13:31:22 - 02:13:54:09

Unknown

You have to have done it with high quality. You have to have passed your complete science assessments showing that you can do these assessments. Your peer mentor has to buy off that

you're ready. There's a self-assessment that now an employee has to say, yes, I'm comfortable in a manager has to buy that off. So it's very structured. You don't get the ability to stamp until you pass through that.

02:13:55:06 - 02:14:26:13

Unknown

and then we've come back and also added workplace coaches since the time of the accident. We've hired 160 additional workplace coaches. We now have over 250 across our programs. They're on the floor. They're they're on all shifts. They're available for any employee at any time to say, I have a question. Can someone come assist me? We have a, a broad array of skills and experience so that they can help with many different functions out there on the floor.

02:14:26:15 - 02:14:55:08

Unknown

And lastly, what I will say is, as a part of this, knowing that we needed to do more to our training, we went back to every mechanic had been there, a year or less, and every inspector who'd been there two years or less and did some basic assessments, ensuring they had the skills as well. It wasn't an ongoing gap, and if they struggled through those assessments, we provided more training and we now are 100% through those assessments with those employees.

02:14:55:18 - 02:15:16:28

Unknown

and so we took steps there as well. Apologies. Can I just ask for the Board of Inquiry? Is that now after the accident, you've done all that or before the last part that I just talked about is since the accident. And it's part of our improvement plan. Thank you. Thank you.

02:15:17:01 - 02:15:25:18

Unknown

How is the training documented and archived for personnel?

02:15:25:21 - 02:15:48:04

Unknown

The exact system is housed in. I can't speak to, but what I can speak to is, we do have, required training. We have safety required training, both personal and product. Safety required training. and we do keep those records. we when you we have required learning. We have a system that comes to each one of us, called my learning.

02:15:48:04 - 02:16:08:23

Unknown

There's required learning. You go in and do it. if you're doing it in a group setting, someone goes in and records your, taking of that class. So those records are there, and we can ensure that all employees of required have received all the required training. And to be clear, is this in as of last year or when did this start taking place?

02:16:08:29 - 02:16:47:03

Unknown

This has been a long time system. I don't have the exact date, but for many, many years, as long as I can remember, duck, can you speak to the differences in training for inspectors and quality personnel? yes. When mechanics come in, everyone goes through sort of a foundational training where to ensure they know how to read a drawing, they know how to access the systems, this kind of thing, or mechanics, at that point, they peel off so that it's really more about, their job, their job function that they've hired and to or inspectors.

02:16:47:03 - 02:17:14:01

Unknown

We have a higher level of training for things like our process. Instructions are instructions. Our BPI is it's important to us that the inspectors, have that higher level of familiarity with all of our KPIs, our requirements that they can pull product data. We call that pulling the drawings, the, the specifications, etc., that they have more familiarity with those kinds of activities.

02:17:14:01 - 02:17:34:15

Unknown

And our training is set up around that. We also have some additional specific training. Inspectors are the people who write rejection tags. We work with them on that. We have a training element for how you correctly identify the location. We call it a three point location on an airplane, how you identify a three point location on an airplane, things like that are included.

02:17:34:15 - 02:17:39:16

Unknown

Inequality inspector training.

02:17:39:18 - 02:18:10:19

Unknown

You have any sort of metric that tracks the effectiveness of Boeing's training program. We've been, really working since the accident. for the sake of clarity, to make sure that we have a closed loop system. So we now are track getting feedback from the peer mentors and, the employees, when they come out, we track the employees self-assessments, we ask them how they're feeling, and then we track the quality of the work that these employees do.

02:18:10:19 - 02:18:40:26

Unknown

Also, we track the compliance activities we have. by compliance activities, I mean things like, maintaining your tool control, during work in process parts appropriately, checking your area for FOD, ensuring that that the area is for process, that we're checking those records as well, and we're feeding that all back into our training process as well as, certification issues or failures.

02:18:40:28 - 02:19:01:16

Unknown

If we see employees who are taking the test to get their certifications not passing, we're now feeding that back into training so we can strengthen that training as well. So to be clear, these were things that were not in place prior to January of this year. We would, more informally track it prior to this year. We would get feedback from the floor.

02:19:01:16 - 02:19:14:18

Unknown

That's how we knew we needed to improve prior. But it wasn't the formally documented closed loop process that we've put in place since the accident.

02:19:14:21 - 02:19:40:04

Unknown

Has Boeing ever thought external audits and validation of their training program? I am not aware that we have sought an external audit for our training program. We have external trainers who come in in some locations, but I'm not aware of the audit process. There.

02:19:40:06 - 02:20:07:12

Unknown

Thank you, Mr. Johnson. Next group of questions is for spirit AeroSystems. Prior to the accident, what type of final inspection was accomplished at spirit before the fuselage was shipped to ensure the product spirit was producing, was delivered to Boeing and it conformed to the highest standard. So throughout the build process, spirit performs several different kinds of inspection.

02:20:07:12 - 02:20:35:14

Unknown

So, for each ship that we spoke of earlier, earlier the, the, the build production paperwork, there's in-process inspections that occur along the way. what that means is in order to, proceed through the build, certain items may need to be inspected and recorded. So, for instance, hold diameters, verify, shim gaps, those types of things, upon the completion of each one of the jobs.

02:20:35:14 - 02:20:56:14

Unknown

Then there's a final inspection that's performed by, by a spirit inspector, validating that the job has been completed. All the, processes are completed as well to satisfy the engineering requirements. upon completion of all the ships that make up the fuselage, at the very end of the line, there is a, we'll do a final FOD walk.

02:20:56:27 - 02:21:22:17

Unknown

Boeing actually participates in the in the final far walk prior to, our implementation of final

product verification. so Boeing and Spirit, well, first, first spirit goes onto the aircraft, validates that there's no farther than the Boeing team comes in. After that, they do a FOD sweep as well. Once that's completed and everybody is satisfied, then, the the, fuselage is shipped to Boeing.

02:21:22:19 - 02:21:29:18

Unknown

And that was before September of 23. Correct.

02:21:29:21 - 02:22:10:03

Unknown

This is the process changed since the accident. And if so, how? Yes, the process is changed in that now there is a an additional process called the final product verification. So everything I just spoke up to this point remains the same, with the exception of the Boeing sidewalk at the at the very end of our assembly. what you saw in the video is the units go from the end of the line onto a railcar and up to right now the procedure is, once spirit finalizes the build and, final inspections of the aircraft, the aircraft then goes through what we call final product verification.

02:22:10:06 - 02:22:42:15

Unknown

Final product verification. we basically take that completed fuselage. it is inspected by, the Boeing team, and the spirit team defects. anything that, was not found in the initial manufacturing and inspection. Boeing and Spirit will recall spirit records the records the defect reworks the defect. Boeing then goes and buys back, ensuring that the, defects have been reworked, to standard.

02:22:42:18 - 02:22:47:00

Unknown

And then the unit is shipped.

02:22:47:02 - 02:23:15:00

Unknown

And general, what changes to the processes or policies have been implemented since the accident? That spirit. So, several things have been implemented. The final product verification is probably the the biggest change. in addition, there's also and process inspections that have been added. So for instance, currently I believe the number is 50. Boeing and process, validations.

02:23:15:12 - 02:23:49:00

Unknown

what that means is, Boeing has identified 50 places, throughout the build of the fuselage that they would like to perform an inspection, on after spirit inspection. So, for instance, the first five steps of, of a of a procedure spirit will will validate that the work is done properly. Boeing then

will perform an inspection, and they will also, sign off on our system, allowing it to move forward.

02:23:49:02 - 02:24:17:07

Unknown

Okay. Miss Lund, what type of receiving inspection is accomplished on a fuselage once it arrives at Renton? This is this is September 23rd, remember? Yes. it in the timeframe of September 23rd, when a fuselage arrived at Boeing, either on flow day one or what we sometimes return refer to as float a zero, which is, in formal position.

02:24:17:07 - 02:24:43:27

Unknown

Really, it just meant let's pull it early. And look, we did a, inspection of the fuselage to look for defects that had come up before in our production system. It primarily related to things like skin quality. We would check to make sure that the skin was flat, that it was conforming. We would check the fasteners to make sure, that they were per specification throughout the airplane.

02:24:43:27 - 02:25:10:14

Unknown

We would check for FOD, as was mentioned, to make sure that the airplane is clean, and so at the beginning of our flow day, we did a relatively, comprehensive inspection of issues we had seen in our production system before. So that we could have those documented, on pickups or rejection tags at the beginning of the flow and, and know what they were when we started our build process.

02:25:10:17 - 02:25:48:07

Unknown

Okay. So back in September, if there was a discrepancy, how a spirit notified it spirit has a team that works in our factory along with us. they a resident team as was mentioned, and led by some spirit management and, we spirit director contract employees. so when Boeing would right these discrepancies, we would then pass them along to spirit, the, pickups, most were on pickups, a few were on rejection tags.

02:25:48:08 - 02:26:12:10

Unknown

If if something were found that needed to be, most were on a pickup document, we would pass those findings along to spirit. And then, began the work with spirit to arrange times to make sure that we had them rectified. And just for clarity, that that if there was a discrepancy, found it it was and is documented on a non as a non conformance in Boeing system.

02:26:13:03 - 02:26:50:10

Unknown

yes. On the pickup, the NCR pickup that we discussed in our system. And is that communicated back to spirit Wichita. Yes it is at the time September 23rd we September of 2023, we had

several elements going. We actually had at that time what we called a daily grinder, just what we called the daily meeting. But every day we would have a call with Boeing, Wichita and our production team on the 737 program informing, Boeing Wichita of the issues we had seen that day so that we could quickly get it back into, spirits.

02:26:50:21 - 02:26:56:28

Unknown

process and and ensure they were aware of the findings we had every day.

02:26:57:01 - 02:27:38:16

Unknown

So let's fast forward to current, what steps have you taken to ensure that discrepancies from spirit are identified and corrected prior to fuselages moving to Boeing? And we'll take that one. as, as as, Mr. Gray Bon indicated one of the changes we added to the process effective March 1st, every fuselage goes through, what we call final product verification, which is a dedicated area in Spirit's factory where we have, Boeing inspectors, typically spend a couple of days going over that fuselage, front to back, outside and inside to identify any discrepancies.

02:27:38:16 - 02:28:05:04

Unknown

Those are documented in spirit system rework by spirit and board back by Boeing inspectors. just add a little context to that. As as Mr. Craven described earlier, the the delivery of that fuselage from spirit to Boeing occurs in Wichita. So we actually take ownership of that fuselage when it goes on, when it's, on the railcar, exiting Spirit's factory.

02:28:05:04 - 02:28:14:16

Unknown

So we want to have that acceptance verification at the location, where it's manufactured.

02:28:14:19 - 02:28:46:00

Unknown

Changes to the process or policies have been implemented since the accident at Boeing. So it's a broad question. It's I'm looking for improvement. So broadly. yes. So, broadly, when when we started to implement our, our changes and post accident, we set a, we set about casting a wide net to get feedback from many, many sources.

02:28:46:02 - 02:29:17:17

Unknown

I briefly referred to it earlier, but we implemented what we called quality stand downs. We had over 70,000 BCA employees go through this quality stand down. This quality stand down was an eight hour full shift, day and a meeting where we started off with a kick off, but we then took all cross-functional teams. This was engineering, manufacturing quality, supply chain professionals, finance, HR, everyone to the airplane to work in cross-functional teams.

02:29:17:20 - 02:29:34:23

Unknown

We taught everyone on the manufacturing floor how we do a compliance walk in a safety walk. We then provided these teams just for helping and understanding. I'll use an example of a landing gear team. The people who buy the landing gear design the landing gear, purchase the landing gear, install the landing gear, service the landing gear. All of them came together.

02:29:35:00 - 02:29:59:09

Unknown

We provided them with all of the defects that have been created in their area recently, and had that team work on suggestions of how we can improve quality or product safety, we we took all of that feedback. We had over 30,000 suggestions come through that activity. we also took all of the feedback from the FAA in the audits that they had come into our factories and conducted.

02:29:59:12 - 02:30:19:12

Unknown

We took feedback from our customers. we we took it broadly from a very broad group of people. And then we we looked at these areas and, and very broad levels. We, we made changes in four key areas. The first is investing in our training. I talked about some of that earlier in how we, changed our training.

02:30:19:12 - 02:30:51:18

Unknown

We held people in training. We've revamped our curriculum, our closed loop system, and so really significant changes to training that are continuing and ongoing. the next is we've started a process really working on simplification, simplification of our processes and procedures, as was recommended to us by the FAA as well as our own employees. during during our audit out brief, the FAA conducted what they call a special audit item and I that's the name of the audit they conducted.

02:30:52:12 - 02:31:14:10

Unknown

and as part of the out brief, they recommended a simplification of our processes and procedures. We are undertaking that, and we are also working on simplifying our installation plans, making sure that they are simple and clear and easy for our mechanics and our spectators to read and access. We then really worked on eliminating defects and a couple of key areas.

02:31:14:10 - 02:31:37:17

Unknown

First and foremost is our supply chain strengthen our oversight of supply chain. With a large part of this being the examples that we just gave for things like spirit. and then also strengthening

our compliance systems, our own compliance, particularly as led by areas where we'd have recurrent auditing findings, internal and external, and that we knew needed to be enhanced.

02:31:37:19 - 02:32:01:00

Unknown

And then lastly is really elevating our safety and quality culture. We took the feedback from the Axx 103 legislation. we have started employee engagement teams, which we have set aside an hour a week for our teams on the floor with cross-functional help to raise their issues, make sure they're getting help with their issues, and that they can work their own issues.

02:32:01:23 - 02:32:15:25

Unknown

and as a part of this, we are also, working on how we better manage travel to work. So all of those have begun to be implemented and are in various stages of that.

02:32:15:27 - 02:32:36:17

Unknown

But specific changes have been made to BPI 1581 to simplify it. I, I will give you a high level overview. I will also say on tomorrow's panel, my colleague Mr. Hector Silva will be on the panel representing the quality management system, and he will be able to.

02:32:36:19 - 02:33:06:08

Unknown

Can even more detail to this if he would like to revisit it tomorrow. but at a high level on BPI 1581 since the accident, we've made a few key changes. we initially went and said, to start with, only leads or team leads would be able to initiate a removal. We have since said and we said at the time, there's a training program that we put in place.

02:33:06:10 - 02:33:47:16

Unknown

Now, any employee who passes the the training or assessment, program of how BPI 1581 works and shows they are they have a competence and a knowledge, a working knowledge of this. BPI can now initiate the removal. So the first change was to, the very first change was we put out what we called a read and sign, a summary of the requirements of the BPI to every employee working in the factory floor mechanic and inspector, having them read reread the requirements of the BPI and sign that they understood it.

02:33:47:19 - 02:34:13:16

Unknown

We then strengthened the requirements of who could write the BPI. We did that so that we could just say to people, you know, you're going to need to go get your lead or a trained person to write this for you so that they would reach out. So get someone with that qualification to write the BPI. And then most recently, we have also added a quality check that says you are okay to

remove, okay.

02:34:13:16 - 02:34:35:20

Unknown

To proceed with removal. You get someone who's qualified, they write the removal and then a, quality, employee then looks over it and says, yep, you're good. You're okay to proceed with the removal. So we have added those additional steps in the BPI since the accident.

02:34:35:22 - 02:35:06:08

Unknown

Thank you. Mr. Catlin. Do you believe that the efforts to change BPI are enough? Well, I would like to point out that in September of 2016, the quality okay to remove was part of the removal process and in September of 2016, the Boeing Company removed it from the process. And now they've added it back in. BPI 1581, as I said, has grown from, it has doubled in size from 28 pages to 58 pages.

02:35:06:08 - 02:35:51:08

Unknown

The majority of the changes to BPI 50 1581 was to add a complex removal scenario where manufacturing engineering could be invoked to write a removal with step by step reinstallation processes, which very rarely ever gets used. But the bulk of the changes that has grown 1581 have been reasons why not to write a removal. There's an entire exhibit in the back of the BPI that gives you tons of reasons why you would not need to write a removal, and, it really should get back to the simplicity of if it's a previously installed part and you're going to remove it from a commercial airplane, you need to write a removal.

02:35:51:10 - 02:36:21:11

Unknown

Thank you, Doctor Woods, if I may, could I just comment? I want to make sure that I did not leave the impression that we are done simplifying. BPI 1581 I agree with Mr. Catlin that we do need further simplification of that. BPI and so I, I want to comment that that is part of our ongoing work. and it is by, by no means in our opinion either.

02:36:21:27 - 02:37:01:01

Unknown

simple enough or sufficient. Thank you. Tucker Woods. Miss Lund, you touched on in the past Boeing's comprehensive product safety and quality plan going forward. And you've also touched on briefly the six, key performance indicators or target areas in which Boeing is now focusing on going forward. given the FAA inspections, given your internal audits that have been conducted on your production system, what prevented these same targets from being identified before the accident occurred?

02:37:01:04 - 02:37:23:26

Unknown

Those those six key performance indicators, and I don't know if it would help. I do have an exhibit listing them if that would help. For the sake of this conversation, that is exhibit six, please. Boeing exhibit six.

02:37:23:29 - 02:37:42:21

Unknown

Just a point of clarification. That's a in Boeing prisons prison. Yes. Boeing's presentation presentation. Thank you. Not exhibit six. Sorry. The public hearing. Thank you. Sorry. Thank you, thank you. Page six of the Boeing presentation I appreciate the help with the language.

02:37:42:24 - 02:38:10:11

Unknown

Okay. the the six key performance indicators that we have, agreed with the FAA that we will use to watch production health, the number of proficient employees. This will help me answer your specific question, doctor. What's very clearly number of proficient employees? We, as I mentioned previously, have always looked at staffing as a requirement. When we go up and rate.

02:38:10:14 - 02:38:31:25

Unknown

This is similar to staffing, except to say, have they passed all proficiency requirements? So have they completed their new structured on the job training, etc.? So do you have enough of the employees that you need in order to work at the rate? The arrow just basically shows the direction we would like it to go. We would like more proficient employees.

02:38:31:27 - 02:38:57:17

Unknown

The next is supplier shortages. We have always used supplier shortages as an indication of the health of our production system. So we think this is representative. It causes disruption in the production system when we have a supplier shortage. So that is one that we agreed with. The next two are really quality related. The first is notice of escapement rework hours.

02:38:57:19 - 02:39:18:17

Unknown

That is rework hours being done in the Boeing production system, typically final assembly as a result of a notice of escapement. That's an escape that comes from a supplier, either a fabrication, internal supplier or an external supplier. and so that just tells us how much rework are we having to do for notice of escapement sent to the factory.

02:39:18:19 - 02:39:45:18

Unknown

The next is a total quality measure how many total rework hours per airplane. We have also

looked at this historically. what we have done, what's really new here is setting the control limits, rolling that into our safety management system to understand when we need mitigation activity, when the risk, has exceeded and and as we, pass one of these control limits, we passed the red control limit.

02:39:45:22 - 02:40:09:28

Unknown

We now run a, safety risk assessment and put documented, mitigated plans in place. That's really the change, not the metric itself, but the agreement of the control limits and the targets. And the action we take next is travelers at factory roll out. That is did we get, the majority of the work within our control limit completed in the factory?

02:40:10:05 - 02:40:31:14

Unknown

And then lastly is really our output metric at the end of the line, how many defects do we find at the time of ticketing? And with the seven, three, seven this is defects found by the FAA at the time of their ticketing activity. So, what I will say is these metrics have been in place with small changes to them over time.

02:40:31:21 - 02:40:59:05

Unknown

What has really changed is the control limits, how we work through our safety management system when we, pass one of those control limits, as well as the fact that the FAA now has, transparent visibility, real time visibility into our system where they can watch these metrics, they update on a daily basis where they could watch these metrics real time across our programs.

02:40:59:07 - 02:41:09:13

Unknown

But those are the real changes. It's the agreement of just these six in the control limits and how we work with them in our safety management system.

02:41:09:16 - 02:41:36:22

Unknown

Thank you. With that, Mr. Breezy, the tech panel concludes this question. Thank you, Doctor Woods. Madam chairman, thank you very much. we're going to move to the parties. I just want, I just want a word of caution here. This isn't a PR campaign for Boeing. What I want to know, what we want to know is what happened in March.

02:41:36:25 - 02:42:07:27

Unknown

April. May. June. July. August. September. Leading up to this, leading up to what happened in January. You can talk all about where you are today. There's going to be plenty of time for that. We want to know the safety improvements, but what is very confusing for a lot of people who

are watching, who are listening, is what was going on that this is an investigation on what happened on January 5th.

02:42:08:00 - 02:42:35:21

Unknown

Understand where everybody great. We're going to move to the parties. And, we are going to start with, questions from the airline Pilots Association. Each party will have five minutes to question, and the witnesses will have multiple rounds as time permits. Parties, please remember, you must limit your questions to the topics listed in the agenda. Please also refrain from asking questions that call for speculation.

02:42:35:23 - 02:43:04:00

Unknown

Finally, remember that only your designated spokesperson may question the witnesses. I'll now turn the floor over to Albert. Thank you, Madam Chair. Our question is for Miss Lund. Earlier, the Boeing speaker program was mentioned, who fully trained and qualified pilots and in-flight crew flew this crippled airplane to a successful landing. They filed voluntary ASAP reports, which stands for Aviation Safety Action Program.

02:43:04:02 - 02:43:37:16

Unknown

ASAP reports are confidential and de-identified and generates improvement and safety in the operation to speak up. Similar. How is it implemented and governed? pick up is similar to the ASAP process. Speak up is a confidential system. It is When you log in to the Speak Up system within the Boeing system, there is an option to submit anonymously, and it is always confidential.

02:43:37:28 - 02:44:07:21

Unknown

the way is administered when the employee writes the speak up, it is assigned to really a function or a program, a part of the organization who will handle it. They do come across, confidentially, I will say I personally read all of them for the safety organization, and I have no access to the employee's name who submits them, the, the investigative team themselves, if they're confidential and came in with a name, would be the team who has access to that so they could go discuss it with the employee.

02:44:08:13 - 02:44:55:00

Unknown

and we, track it in our safety management system reviews, we track the completion, the actions we do it by function, by billboard, and then at program levels. the one other comment they will make related to us ASAP, as I understand it, is the the elements of ASAP, where the unions and the companies and things work together is the element that we were working on when we formed our try party agreement last year with the FAA and the IAM to ensure that we were,

trying to find similarities to that same process of the ace up with the union representation in the loop, as well as the FAA.

02:44:55:03 - 02:45:15:24

Unknown

Thank you. Prior to Covid, manufacturers allowed airline quality control inspectors to observe the build process. Airlines had inspectors stationed in the factories. As that process been brought back to the quality assurance of the build after Covid. I believe this is both for Boeing in spirit.

02:45:15:27 - 02:45:39:29

Unknown

And we can both take it. I will I will start by saying we do have, airline inspectors in our factory and at our flight line. we actually did have it, pre-COVID. We have it today. We have quite a few customers. We have customer inspections throughout our build process where, the customers can come and inspect or say, good to go themselves, or they can delegate that to the building quality organization.

02:45:40:05 - 02:46:08:14

Unknown

But it is, it is currently in process. Okay. Thank you. It's been described during interviews with employees and FAA inspectors that experience levels at spirit have decreased over the last five years. I was spirit addressing on the job training for technicians. When the majority of the experienced technicians have left or retired.

02:46:08:16 - 02:46:37:17

Unknown

I mentioned that earlier. We've expanded this to, 6 to 8 week training. We are going to do an additional step, Elizabeth admitted. Similar to that. So another two weeks of specific OJT into the area that they're going to go into. so that they could be more aware of the requirements that they're playing in there and the requirement their future work.

02:46:37:19 - 02:46:48:14

Unknown

Follow up question to that, what training records show standardization or proficiency from that? On the job training you described?

02:46:48:17 - 02:47:21:08

Unknown

I'm not familiar with all of the details through the training group, but, but I'm sure that it's collected, but I'm just not familiar with. Thank you. My follow ups to the Am. What changes to technician training have been implemented from an IAM viewpoint to mitigate this risk? Well, we've never been impressed with Boeing's training at all. And since, somewhere around 2008,

prior to 2008, there was pre-employment training that was required and there was extensive, skills process center training that was required.

02:47:21:08 - 02:47:53:14

Unknown

Now that's all changed. prior to the January 5th door plug blowout, Boeing's training at their foundational training center was in really bad shape. there has been changes, but I don't know that it's enough. Q and, and last question to Miss Lund. All the extra on the floor training experience discussed earlier sounds pretty positive. I am discuss the degradation of BPI training, from formal training to bulletins and now tips.

02:47:53:16 - 02:48:00:18

Unknown

I will Boeing prevent a reduction in these after accident improvements.

02:48:02:00 - 02:48:28:09

Unknown

Thank you. Sustaining these gains is super important to us. We, are documenting much of this in command media to ensure that it is, formalized. We are auditing against these improvements with our internal audit team as we make them. first and foremost, we're making the commitments to ourselves and then to the FAA who we're auditing against them to make sure that they maintain we are, watching the metrics.

02:48:28:15 - 02:48:57:14

Unknown

That's why we're working on these closed loop feedback loops. And ultimately we will use our SMS process, and our, SMS architecture that as we change our processes, we will evaluate the risks from changing those processes. We will run SRM and SREs so that we have clear visibility of the risks occurring as we make changes. Keep.

02:48:57:17 - 02:49:16:15

Unknown

Thank you very much. We're going to go, with Alaska Airlines. Thank you. Ma'am. as far as this first panel on the overview of the manufacturing, we did have a series of questions. The technical panel did a very good job of clarifying the things that were on our minds on no further questions. Right. Thank you very much.

02:49:16:15 - 02:49:45:14

Unknown

We'll go with the Association of Flight Attendants. Thank you. This question is for Boeing. All 737 exit doors, including mid exit doors, have a door proximity switch that illuminates an indicator light in the flight deck. When a door moves even slightly out of its locked position. However, exhibit nine A indicates this warning system appears to be partially installed, but not

used on the 737 Max nine mid exit door.

02:49:45:19 - 02:50:30:12

Unknown

When a door plug is installed. While door plugs are not opened during daily operations, they will be opened many times for maintenance over the fleet's lifetime, introducing the possibility of an insecure closure. An operative door proximity switch could provide an additional layer of safety by alerting the pilots to any door plug movement, resulting in subsequent maintenance action. The structure Group chairs a factual report documents that door plug separation on flight 1282 occurred at only 16,000ft, where the pressure differential between the inside and the outside of the aircraft was slightly lower than it would have been at cruise altitude.

02:50:30:14 - 02:50:57:14

Unknown

While the aircraft is certified to withstand a sudden decompression at any flight altitude caused by a hole slightly larger than an aircraft window. The hole created by the departure of the door plug was more than twice that size. A door plug failure must be extremely improbable, which the FAA defines as a condition so unlikely that it is not anticipated to occur during the entire operational life.

02:50:57:17 - 02:51:42:27

Unknown

Of all airplanes of one type, with a probability of less than 1 in 1,000,000,000. Alaska Airlines Flight 1282 suffered door plug separation just 73 days after aircraft, and 704AL was manufactured. The system also excluded on the 737 900 ERS and with door plugs, and considering the potential catastrophic structural failure that could result from a door plug separation at cruise altitude, why was the decision made to exclude this and any other warning system on door plugs?

02:51:46:11 - 02:52:20:01

Unknown

With the caveat of not being a door design expert, I will tell you, to the best of my understanding where we are. So you are correct. We have, door warning sensor and light on doors that that, notifies in case of a, that its movement were not fully closed. it was not included, as I understand, to the best of my knowledge, on the exit door plug, because the plug was intended to be a structure, not something that opens and closes.

02:52:21:05 - 02:52:47:15

Unknown

we, absolutely agree with the the standpoint that it needs to be extremely improbable, that changes need to be made. upon my conversations with our engineering experts, they are, they have looked at activating the sensor for the plug. They don't think that will work necessarily as we would want. They are making changes to that plug.

02:52:47:18 - 02:53:15:00

Unknown

They are, working on some design changes that will allow the door, the plug to not be closed if there's any issue until it's firmly secured, that would hold it securely in as well as simple changes to make sure things like that the fasteners are landed on. So they they have done a review assessment of ways to improve it, to make sure that we make it so it can't move again.

02:53:15:00 - 02:53:38:21

Unknown

And these are the changes that are in work because they felt that those would be even more secure. And that's what we're proceeding to work on. So it sounds like you're implementing some physical mitigations. Are those going to be retrofitted? when they're developed? Yes. They will. Do you have a timeline for those mitigations? I understand it from my my discussion with the chief engineer that they have approved the design changes.

02:53:38:21 - 02:53:56:20

Unknown

To begin, I don't have a time frame. a rough estimate. I would say within Boeing, I expect them to be implemented. I know this is a very rough estimate, but I'll say within the year, we will then make them available for retrofit in the fleet once the design gets certified and production. I ideally it will be much quicker than that.

02:53:56:20 - 02:54:15:02

Unknown

I just don't have the detailed plans. We don't have the actual design completed so that we can flow it out. I do have more questions, but it looks like I'm running short of time, so I will yield. Thank you very much. Federal Aviation Administration.

02:54:15:04 - 02:54:31:13

Unknown

Thank you. Chair. a few questions. First one to Boeing. Can you explain your delegation of authority to spirit for changes? What types of changes must be reported to Boeing from spirit?

02:54:31:15 - 02:55:03:09

Unknown

To, in our, in our supply chain, there are suppliers that do have, design responsibility for product. in this case, structures has design responsibility for, the 737 fuselages or most elements of the seven, three, seven fuselages. we have the oversight of that delegation. from an engineering perspective, there are, requirements for what types of changes would need to be brought, to Boeing.

02:55:03:09 - 02:55:21:14

Unknown

So basically a major change versus a minor change. and anything that would fall into that major category or significant category, anything that would require, certification, changes to the product would, would, have to have to come through Boeing.

02:55:21:17 - 02:55:47:13

Unknown

And next question for spirit, regardless of customer demands, if your workers identified significant safety issues, what procedures or processes did you have to hold the line to address the issue? So you can you can look at it as a a did and do, if you will. So are we are we talking strictly through the manufacturing process.

02:55:47:13 - 02:56:15:12

Unknown

So in the manufacturing process, as far as holding the line, if a, if a mechanic or an inspector identify an issue, they, they can you raise your hand. We have an issue. The quality inspector will come over, determine what the impact is. based on what type of defect has been found and what the, what's required in order to, to, correct the defect?

02:56:15:18 - 02:56:36:20

Unknown

I we talked tags earlier. A tag would be written engineering with disposition. What needed to what needs to take place in order to to bring the part back to conforming at times. the the decision will be made that that aircraft can move while we're waiting on things such as parts to come back in. if a special part is required, something like that.

02:56:36:20 - 02:57:02:16

Unknown

There's an order of precedence. the order of precedence dictates whether or not, the next job can take place or, whether or not the, the fuselage can proceed, and then the part can be installed at a later time. As far as additional raising of your hand, spirit has something that we call quality 360, which is an anonymous, process where, anyone anyone within, within spirit.

02:57:02:16 - 02:57:24:16

Unknown

It doesn't have to be an inspector or mechanic. It can be anybody that they have a concern, regardless of what the concern is, they file that concern, and then we have an internal audit team who looks at those concerns. They do a an investigation and determine whether or not, well, what they determine what to do with the with the results of the investigation.

02:57:24:18 - 02:58:05:15

Unknown

Thank you. And then for IAM, Lloyd, was there a high turnover in mid-level management at

Renton facilities? Yeah. After the, the two plane crashes and Covid, Renton was empty for a long time. For 20 months. when I was representing our members down in Renton from January of 2023 through May of 2023, according to the numbers provided to me by Boeing management, 60% of the Boeing workforce, including management, had less than two years with the Boeing Company in the Renton facility.

02:58:05:17 - 02:58:42:09

Unknown

Then Lloyd also was was. I am involved in promotion of workers to quality inspector. Well we have a system. It's called the, the employee transfer. I came to think of it right now, the ERP system employee requested transfers, which is a system that has been worked into our contract with the Boeing Company that would allow somebody to go and take courses that would turn their red lights to green, which would allow them to file an IRT to be able to self promote themselves through the Boeing Company.

02:58:42:09 - 02:59:08:03

Unknown

So somebody could go from a manufacturing position to a quality position by accomplishing the courses and then filing the ERP, which would allow them to take that open position. The problem is, is that we have issues in our labor agreement that, prevent a lot of our, our manufacturing people from following through the ERT process because it would freeze their wages for an additional period of time.

02:59:08:03 - 02:59:30:12

Unknown

And so, we are seeing a lot of people filling quality roles from the street rather than internally because of the complications in the ERP system and basically holding people back. Thank you very much. It looks like I'm out of time. Thank you very much. Mr. Gerlach. Going to I am.

02:59:30:15 - 03:00:06:24

Unknown

Thank you, Mr. Chair. I have some questions for spirit. has spirit shifted in process inspections performed by quality inspectors who mechanics make conformance decisions on the work they perform? For example, inspections for wand and ground facial imaging or inspection on close tolerance holes. No. So quality is responsible for for those inspections. So the mechanic has responsibility for their work and the quality of their work.

03:00:06:28 - 03:00:35:21

Unknown

But a mechanic cannot sign off on an electrical bond that has to be performed by a quality inspector with electrical bond certification. So in process inspections for close tolerance holes and shimmying, those are all performed by inspectors. Those are performed by inspectors. Thank you. does spirit use the statistically based sampling plans to verify conformance in place

of a, quality inspection?

03:00:35:23 - 03:01:01:01

Unknown

I, I if I understand your question, they we use statistics to say this is okay to remove an inspection. Is that the path you're on? Not okay to remove. But, you know, logistical monitoring, system process monitoring, instead of a, you know, second set of eyes to look at the operation, or the final work of the operation.

03:01:01:04 - 03:01:25:08

Unknown

Yeah. What spirit will look at, quantity of defects found or, escapes throughout the line. So, for instance, if, if, there's a repeat escape, something that's found, outside of position, we will add you where we can. We have the ability to add an inspection back in the location where the work is, is to be performed.

03:01:25:17 - 03:01:45:03

Unknown

in addition to that, if that work were to move or it it would travel for any reason at all. We have a quality alert notification system. It's called a ssion. that, you know, NMS system, in order for the job to be completed and to proceed on, that job has to be checked through the Ms. system. Does that let me let me add to it.

03:01:45:06 - 03:02:16:06

Unknown

We have not replaced inspection, with SPC data. Thank you. this question is for, Miss Lund. Boeing. we had lots of discussion about BPI 1581. In fact, there's just one BPI. There are many on how to build the aircraft. BPI 1581 defines a removal process. There are KPIs that define when rework invalidates previous okay to install inspections and many others.

03:02:16:08 - 03:02:39:25

Unknown

So what has been done since the accident by Boeing to ensure comprehension and training of mechanics and QA within Boeing or contractors from spirit to comply with BPI each time the BPI is have been revised.

03:02:39:28 - 03:03:12:08

Unknown

The, I previously commented on our current system of alerting mechanics of BPI changes. We are working on improving that we don't have that fully implemented when it comes to spirit mechanics. We have implemented an assessment process that when a spirit mechanic comes to work in a Boeing factory, we put them through the same assessment. We put a structures mechanic, a Boeing structures mechanic through before they can go work on the floor.

03:03:12:08 - 03:03:46:01

Unknown

So we do now a Boeing hands on assessment of that mechanic, including following the processes to ensure that they can pass that same level prior to going to work on the floor. we have put out, quality alerts or tip sheets, depending on the location, for issues that we have found issues with since that time, but that is still, how we are updating and keeping our employees updated in and working to improve that process.

03:03:46:04 - 03:04:26:04

Unknown

Thank you. this question is for Mr. Catlin. it's more of a situational, question around how something might be installed and inspections. So when insulation blankets are installed over existing structure with an okay to install inspection, what does that inspection accomplish? Well, if we use the an 8789 airplane, the okay to install installation plan, lists everything that the mechanics, the quality inspector and the customer coordinator or life customer, whichever it is, is looking for, and they're looking for loose or missing parts.

03:04:26:04 - 03:04:54:07

Unknown

They're looking for open holes, loose or missing fasteners, damaged fasteners, FOD missing CIC chips, scratches, nicks, dings. They're they're looking for everything. in that closure area which on that IP was seven was stationed 727 to 887 from Stringer 17 all the way across the top of the crown to the floor on the other side. So it's it's an extensive and, inspection that covers a large area.

03:04:54:09 - 03:05:26:19

Unknown

What happens if there is a need to perform rework like on on the five rivets behind the already installed and stamped complete blankets. The the if the blankets had been installed and there was rework that needed to be performed in the closure area per by 2573, which is perform conformance decisions or something. section 4.2 or 4.3 would require the the invalidation of the okay to close.

03:05:26:19 - 03:05:55:25

Unknown

It would require the stamps be removed and that okay to close be re performed by manufacturing quality and the customer. In BPI titled apply authority Media in Common Manufacturing Execution System, or CMA, as it states, when disassembly of work is necessary to remove shop authority media before inspection, would this require QA to remove the stamps associated with the okay to install insulation blankets?

03:05:55:27 - 03:06:04:17

Unknown

Correct. Yes, it would.

03:06:04:19 - 03:06:33:01

Unknown

That have driven. Once the rework is complete, would that have driven another okay to install inspection on the blank is before it covered the structure, including the medi plug. Yes it would. It would have it would have cause for the okay to install in that area to be re performed, which would have caused manufacturing to go in, verify everything that they had on the previous okay to install, which would have been loose or missing fasteners, open holes, missing safety and devices.

03:06:33:09 - 03:06:56:12

Unknown

it would have been caused line quality to re inspect the entire area, including the med plug, and then it would have caused customer coordination to perform another inspection. So it would have put three sets of eyes on that door plug prior to that. Good. That blanket going back in. Thank you. No further questions. Thank you very much.

03:06:56:12 - 03:07:19:28

Unknown

And we'll go to spirit. Thank you. Chair. Mr. Greymon. So, with some of the changes in the workforce, that we've had in some of the challenges, and you maybe speak to some of the investment that spirits made and the automation incorporation into both production and inspection processes.

03:07:20:01 - 03:07:50:19

Unknown

There's been a significant investment. There's there's, we look at things. What can we automate? in the manufacturing world and what what can we use to help our inspectors inspect, in the video that you saw earlier, we have, tools such as spiffy. spiffy is a measure measures fastener head heights. Although not it doesn't cover the entire fuselage, but it does cover, section 41, which is our which is the nose of the aircraft, which is, where complex contour is very difficult to measure sometimes.

03:07:51:13 - 03:08:14:10

Unknown

spiffy is, I believe, installed on ten out of the 14 locations. right now, an additional excuse me. In addition, we have, something called an eight tree scanner. an eight tree scanner, looks at, at an area about an eight and a half by 12, in that it gives you a basically a topo map of whether it's a skin depression or, fastener installation.

03:08:14:12 - 03:08:40:05

Unknown

And you can it looks to a thousandth of an inch or so. on the manufacturing side, automation, you saw a lot of our auto fastening equipment, that we're using, we we utilize that type of equipment to help improve, the, the product. And that's been that's been going on long before before this incident.

03:08:41:20 - 03:08:50:01

Unknown

I'm trying to think if there's, any other things that we've done, I think that I think that's it.

03:08:50:03 - 03:09:17:14

Unknown

Also, maybe talk, Mr. Graham, on to the initiative that, spirit took on in in January 2023 and then kicked off midyear that year. having understood the challenges with the, the newer mechanics and the different workforce, with the employee proficiency process that now is campus wide. So spirit looks at that. There's there's training in place, that what we do is we test our employees.

03:09:17:14 - 03:09:39:12

Unknown

So, each one of the training programs, you can take a they'll take a pretest, will take a post-test, to determine how proficient they are. We then take an entire list of the mechanics, matrix through a matrix, looking at different skill codes, and we check off, on a rating. I believe it's one through four.

03:09:39:25 - 03:10:05:04

Unknown

the proficiency rating of those mechanics. So the idea, and the concept behind it is, is looking at the proficiency of the mechanic, and you put the right mechanic in the right place. the build is, is unique in that some areas, don't do not require a long term, highly, highly skilled, seasoned mechanic where other ones do.

03:10:05:04 - 03:10:27:24

Unknown

So, when you look at things like lap joints that you saw in the video, laps and loops, a lot of hand driven fasteners, those are typically are more experienced, mechanics, the ones I'll have a higher proficiency ratings. and then we install things like workplace coaches, workplace coaches, then help bring people up to speed, and help help them understand.

03:10:27:26 - 03:10:46:11

Unknown

And the build, help them, see where, where there are deficiencies and then improve on it. Does that answer your question? Yeah, I can you talk to what we still have left to do, maybe with that process to get the right person or their job. Yeah. So that yeah, I don't, I don't want to we're

we're not there yet.

03:10:46:11 - 03:11:07:02

Unknown

So a lot of talk about, the skill sets and the skill set being different post-Covid and I that's very true. we do have a long way to go. what we are trying to do is ensure that, when people are in that position or in a position, can we keep them in that position?

03:11:07:18 - 03:11:25:06

Unknown

turnover causes us to move some, some people around. And it's the same with inspectors. The idea is can you become proficient in an area? And if you can become proficient in area, that means your quality will get better over time. And when your quality gets better and the quality inspectors are all looking at the same thing, everybody starts seeing the same thing and then it becomes more routine.

03:11:25:13 - 03:11:37:04

Unknown

The idea will be as time moves on, will become where we were just a few years back, where a single mechanic can do multiple jobs across the factory.

03:11:37:07 - 03:12:01:00

Unknown

And then real quick, if you could just talk to how important it is to get the feedback from our customers and the customer's customer a little bit on that sham process quickly so that we can that we had in process before as well. Yeah. So I think it's important to note that we've we've talked about the final product verification process, and that was all post, the incident, beforehand, I think either Miss Lunder, Mr. Ackerman spoke about the grinder meeting.

03:12:01:06 - 03:12:26:20

Unknown

there is there is always been a return loop between spirit and Boeing, with, with any defects, found in the northwest. So, yes, they'll they will talk to, the Boeing on site or the spirit on site team up at Boeing. But then that that information is sent back technically, through our Swift system. Suisse's, supplier quality information system.

03:12:27:13 - 03:12:48:24

Unknown

those the effects are then tracked and they're looked at, Boeing now, with the addition of some of their, their, inspections. They are looking for thing that Boeing Renton talks to Boeing Wichita. Very well right now. we're also in that loop. But the idea is to put two sets of eyes on the product. Boeing runs Green lines.

03:12:49:09 - 03:13:08:29

Unknown

Boeing looks at skin depressions, all those things that they're seeing in Renton are now being inspected in Wichita and looked at, with multiple sets of eyes. Thank you. Thank you, Madam Chair. Thank you very much. Back to Captain Jen Gillis.

03:13:09:01 - 03:13:29:08

Unknown

Thank you, Madam Chair. Does this is for Mister Catlin. Does the I am have confidence in the speaker program as defined by Boeing? It is in its early phases. it needs help. We at this point. No, we do not have confidence.

03:13:29:11 - 03:13:56:20

Unknown

No further questions. Thank you. Thank you very much. Alaska. No further questions. All right. FAA yes, I have a follow up for Miss Lund. can you share a little more information? As I'm not an expert on the Middle East, about who made the design decision not to have a backup or redundancy for that door. It has a single point of failure, essentially.

03:13:57:12 - 03:14:28:29

Unknown

I, I don't think that I can provide the answer on who made that decision. I wasn't part of the design team, but I could certainly find the answer to that and get it back to the committee or the panel or you, if that would help. We'd like that. Thank you, thank you. And then also, for Miss Lund when you had required reading, for things like changes to the BPI prior to 2017 for employees reading them during paid time.

03:14:29:02 - 03:15:06:16

Unknown

The required reading program. And I'll defer to Mr. Catlin. I think you said it was actually as far back as 2008 or 9 or 2000, something early that it was removed. but yes, back in that day and I was involved back then as well. it was the required reading was put out on paid time. Can you help us understand why that decision was made to remove the required reads and how do you then invalidate or validate that employees understand the changes, like those made to the BPI, and ensure that the change is performed as expected?

03:15:06:21 - 03:15:38:18

Unknown

The work is then performed as expected. I apologize that I, I don't have the background on why it was removed. I, I was, not in a role anywhere near that at the time, so I apologize. I don't have the background on why in the past, I think we have, prior to our recent activities in the past, we have really counted on, our audit activities are oversight activities and things like that to ensure that our employees, were proficient, we would roll out the information.

03:15:38:18 - 03:16:02:24

Unknown

We would, communicate. When there were issues, we would redo training. We did have our our training of various parts that would come out on an ongoing basis. But we, need to strengthen that communication. So if I understand correctly, employees don't have a designated time while they're at work to absorb that information and learn that new information.

03:16:02:27 - 03:16:08:27

Unknown

At this time.

03:16:09:00 - 03:16:33:19

Unknown

I will say, we do work with the BPI and the data with our quality inspectors. We do have, times where we review some of this information with our quality inspectors, with our manufacturing teammates. I am not aware of a time set aside where they can really, discuss things like that and then also for you, but, a different question.

03:16:33:21 - 03:16:58:27

Unknown

You provided a lot of information about your, safety actions that you have been implemented or that you've implemented since the accident. you've been implementing SMS over the last few years. What part of your SMS would have been responsible for identifying the types of gaps that, led to the accident? I think when I think about the SMS we have in place today, one is on travel to work.

03:16:59:00 - 03:17:42:03

Unknown

I think the the fact that the the defect rework traveled through the factory, is an element that we now have a safety risk management for and a plan for. So there's one element of the SMS that I think would have, helped. I think, The supplier oversight, particularly the supplier oversight elements of, issues that we saw on a recurring basis using the data and data analytics elements of the safety management system to proactively trigger an SRM and make sure that we had, we're working proactively on, on some of these recurring traveled work things.

03:17:42:03 - 03:18:07:00

Unknown

So I think would be another element of the safety management system that, would have helped. And then lastly, I, I think the fact that our removal program, that part did work in 2023 prior to the accident, we had had several speak ups on the removal process, and we had started some activity on the removal process. We had started an SRM on the removal process.

03:18:07:03 - 03:18:34:27

Unknown

We, simply did not get the elements implemented prior to the accident. And if I may, you've mentioned SREs safety risk assessments quite a bit and that you're performing a lot more of them. I was curious about the trigger for an x ray for times when out of work, is out of order, work is completed, and then also our frontline employees via their EIR IAM representatives included in the SRE process as a stakeholder.

03:18:35:21 - 03:18:57:21

Unknown

it it's triggered on traveled work. We have an element. We have elements of this travel to work process that that and again to answer your direct question that was implemented after the accident. This was not in place prior to the accident. But that lists the the critical jobs and we do a safety risk assessment if anything is impacting those critical jobs.

03:18:57:26 - 03:19:19:17

Unknown

Then again, on the total quantity, and IAM employees are part of assessing, and they complete the statement of work in the next position safely from both personal product and safety product. It's a cross-functional team of engineering, and our IAM represented employees who make this assessment that it is okay to move some statement of work, so they are involved at the floor level.

03:19:19:19 - 03:19:23:01

Unknown

Thank you.

03:19:23:03 - 03:19:53:06

Unknown

Thank you, Mr. Gala. Thank you, Madam Chair. couple questions again for Boeing. what is the quality inspector's role in the bill process? Not now, but back when the airplane was being built. Like, I think a at a high level, the answer is somewhat the same in the answer is the quality inspectors role is to once a mechanic completes their job and stamps it as complete.

03:19:53:09 - 03:20:13:00

Unknown

Typically afterwards, the quality inspector comes behind and validates that that work was completed for drawing and per process and is compliant. And then they stamp it at. At times it may require they do a live witness of the job being completed, but typically they come after the job is complete and validate that the part of the airplane is now conforming and have that.

03:20:13:03 - 03:20:43:09

Unknown

And there's in the paper for installing, removing and reinstalling that plug. There's quality stamps for that as well. On September of 2023, when I removal was written, a quality inspector must stamp off the closure of the removal that has always been in place. So what was not required then was the requirement for quality to stamp off before it's removed to make sure the paperwork is correct.

03:20:43:16 - 03:20:55:28

Unknown

But it was always in place that before a removal or when a removal was complete and it was reinstalled, that a quality inspector would validate that the job had been reinstalled correctly.

03:20:56:01 - 03:21:17:24

Unknown

And you talked a little bit about safety risk assessments. Does Boeing perform a safety risk assessment when a BPI is changed? Did they back then and do they now and then just kind of a follow up. how do you decide when to perform a safety risk assessment.

03:21:17:27 - 03:21:46:10

Unknown

Answer your question on every BPI back then. No. in September of last year, we were growing in our SRM and we were evaluating those that we thought caused or posed a higher risk. As we are now expanding it. Now, we are looking at broadening it to virtually all kinds of changes like that to take a look. It was not all changes a year ago.

03:21:46:13 - 03:22:18:04

Unknown

That's where we are moving toward right now. Q and then for Mr. Kaplan, it is I am involved in safety risk assessments as well. No, we have no role in them. And that's all the questions I have to thank you very much. We will move to I am. Thank you. This question is for, Mr. Catlin. Boeing referenced that manufacturing isn't getting work.

03:22:18:04 - 03:22:49:14

Unknown

Time to review BPI changes, but the QA is. So Mr. Catlin is is Boeing providing adequate time and resources for you to become familiar with BPI revision? So in my experience and the members that I represent, they're since they've done away with required reading, there is no time set aside for our manufacturing personnel. They have a set amount of time before they have to be clocked into a job, after they clock in to work, and then they're on a bar.

03:22:49:14 - 03:23:10:13

Unknown

And those bars are not accurate. they will say that this job is going to take two hours. It should take it actually takes for, the, the bars that our manufacturing personnel work to are not fair.

They're not accurate. And there is no time set aside to do required reading or to for anybody to focus on what changes are being made.

03:23:10:13 - 03:23:55:12

Unknown

They're not receiving a weekly notification of what BPI pros or policies have been changed that affect their job skills or their skill code. So, I have no knowledge of any time set aside for our I am members to study BPI changes are quality alerts that were referenced. since required reading is no longer fired or quality alerts enough or they detailed enough to describe all changes the revised BPI well, the the big problem is that with with required reading, you had an acknowledgment button that you had to select after you were done going through all the changes and reviewing what changes had happened to the APIs.

03:23:56:03 - 03:24:21:05

Unknown

I reviewed three quality alerts that were released last year that affected, BPI 1581. I think it was 055056 and 057. None of them have acknowledgment, controls on them to show who's who's read them, who it is that has, received them, or who it is that has roster training that they have received. and understand them.

03:24:21:08 - 03:24:27:12

Unknown

Thank you.

03:24:27:15 - 03:24:54:22

Unknown

Thank you very much. Spirit. No questions, Madam Chair. All right. Well, we still have some time for your panel, so let's just see. Do does Alpa have further questions. And I just wanted to say, Miss Lund. Mr. Ackerman, thank you very much. I know you're purposely now trying to differentiate what time period. And just to clarify, it is very important to us to determine changes that you've made in, in process improvements.

03:24:54:22 - 03:25:29:18

Unknown

And throughout over this period of time. I didn't want to I didn't want anyone to misunderstand that. It's just a little blurry. So this clarification of time period is actually extremely helpful. So thank you very much. Alpa. We're good, Madam Chair. Thank you. Good. Mr. Tidwell. Of course. No questions. All right. And, Yes, I noticed a difference in the responses about the SREs between Mr. Catlin and Miss Lund.

03:25:29:21 - 03:25:56:11

Unknown

As far as whether or not there I am included in those. And that you're getting the front line

perspective. What I will offer. I am interested in Mr. Collins perspective in this. As I mentioned, these are the changes that we have implemented. We've rolled them out. Flow day one through seven on the seven, three, seven program and we the 787 program has four build positions.

03:25:56:13 - 03:26:12:18

Unknown

We have rolled them out in the first two build positions of the seven, eight, seven. We intend to roll them out through all of our factories. But as Mr. Catlin mentioned, he is in Everett. We have not yet implemented this on our six seven and seven seven programs in Everett. That may be why he has not seen it.

03:26:12:25 - 03:26:29:04

Unknown

This is a, project that we have rolled out since the accident in conjunction with the FAA, and it is still being deployed. So that might also result to that floor level. I will defer to Mr. Catlin to comment on that.

03:26:30:09 - 03:26:50:23

Unknown

I, I can't speak to what has happened in Renton since January 5th, so I don't know what they're doing down there. That's we have two other representatives that represent or three other representatives that handle the factory. I don't know about run.

03:26:50:25 - 03:27:12:20

Unknown

Q and this is a rather broad question for Mr. Catlin, but did AMS observe any safety gaps in the manufacturing process that he felt needed to be corrected prior to the accident? And then can you provide some examples, and what steps did IAM for your members take to get those addressed? What was the outcome? Well, that's a big question.

03:27:13:11 - 03:27:43:04

Unknown

yes. Yeah. So there's some major issues that the IAM has had over the last several years. So, in January of 2019, Boeing implemented their quality transformation plan between the two Max crashes. they decided that they wanted to implement something they named verification optimization, where they went through and removed tens of thousands of inspections off of airplanes throughout their production cycles.

03:27:43:18 - 03:28:10:16

Unknown

we know that they removed approximately 3200 inspections off of the 737 Max line between 2017 and 2019. They removed 7800 inspections off the 777 acts. They removed tens of thousands of inspections off of functional tests, 6600 close tolerance, whole inspections of the

767777 programs. not to include not even including the okay to close okay to install.

03:28:10:18 - 03:28:40:25

Unknown

I mean, there was tens of thousands of inspections. I was selected to represent the IEM as a verification optimization representative in Everett. we had extensive debates with the Boeing Company, and we were told, thank you, but we're going to do it anyway. So we were forced to turn to the FAA and begin filing hotline reports with the FAA, which ended up driving a very large enforcement investigation record that was issued on May 18th of 2021.

03:28:41:15 - 03:29:02:20

Unknown

after that, there were still several hotline reports that I was continuing to file. the FAA asked me to begin in, using Speak Up because my hotline reports were, consuming a large amount of time. And it was speak up was new. So I agreed, and I began filing speak up reports, which were immediately being closed.

03:29:02:20 - 03:29:39:03

Unknown

So I turned around, filed hotline reports, and they were substantiated by the FAA. And that's what drove the tri party agreement. So, yeah, we've had, extensive issues with safety and quality at the Boeing Company going back to 2014, 2016, three of a compliance findings issued in November of 2017 stating you can't replace quality inspections with manufacturing verifications, only to have them roll out a new BPI 6631, where they removed tens of thousands of inspections and replaced them with manufacturing verifications.

03:29:39:05 - 03:29:49:04

Unknown

A quick follow up from is none. Have those inspections been put back or are there plans to put them back?

03:29:49:06 - 03:30:15:13

Unknown

We now have more inspections per airplane on A737 than it certainly any time within the last ten plus years when we look at average number of inspections per airplane. So I will say we have added in a lot of inspections. We are continuing to add in inspections. for complete clarity to your questions, when we say we're all inspections put back in verification.

03:30:15:13 - 03:30:49:27

Unknown

Optimization was originally designed to remove inspections where there was going to be another inspection looking at the same thing right after it, nothing was going to be closed. You'd be able to see or we had inspections for things that happened off the airplane. We did remove

some of the airplane inspections that are not related to the build of the airplane that we have not necessarily reinstated, but in terms of in stating inspection on the airplane, we inspect more items on every airplane today than we have previously.

03:30:49:29 - 03:31:00:05

Unknown

And so, yes, they they are back in and we are continuing to add.

03:31:00:08 - 03:31:23:12

Unknown

We want to follow up for Mr. Kotlin. Are we out of time? we you are out of time. Is it one follow up? No, I just want to know if you have slower response to, oh, this little statement. Yeah, I, I don't I don't agree with, anything of missile, lung's perception of what verification optimization was 6600 close tolerance, whole inspections there.

03:31:23:12 - 03:31:52:24

Unknown

Once you install a fastener, there is no reinsert. There is no re inspecting that, removal of shim inspection, carte blanche across all programs, every shim of 4000 or greater does not get inspected to this day, on the majority of our airplane programs. those you cannot inspect after the fasteners have been installed, if their face healed, once those fasteners installed and they're pulled up, there's no re inspecting that, functional test inspections.

03:31:52:24 - 03:32:25:09

Unknown

They were removed off of the just in time test and the installation plans in the thousands on every airplane program. Once you've passed that. And all of this was rejected by the FAA in ER 2021 and the 420001 encountered conditions four through seven, assigning conformance decisions, assigning manufacturing to manufacturing is not acceptable to the FAA. And so we have a very different perspective of verification optimization.

03:32:25:11 - 03:32:58:00

Unknown

Speaking of the FAA, Mr. Gerlach, you're up. Thank you, chair, with regard to those inspections that you've you've added or moved to a different place, you still have quality inspectors there doing those tasks. Yes, we do. And we've added inspectors as well. we have more inspectors on the 737 program than we have in history as well, and we have twice as many as what we had in 2017 at a high rate today.

03:32:58:02 - 03:33:26:06

Unknown

And so what you're saying is there's a pretty significant change from back when this aircraft was manufactured to where we are today. Correct. And then with, over to spirit, did spirit have a

voluntary reporting system prior to this event? Do you have one now? yes. The quality 360 was a voluntary reporting program. I don't know exactly when it started, but it was prior to the accident.

03:33:26:09 - 03:33:57:02

Unknown

Thank you very much, Madam Chair. Those are all the questions that we have. Great. machinists. No further questions. Thank you. Spirit. No, the no further questions. All right. I just want to make sure, because you do have ten more minutes. For any questions? No, madam chair, Alaska? Nope. RFA. No further questions. All right, FAA, no further questions.

03:33:57:02 - 03:34:02:05

Unknown

Thank you. I am.

03:34:02:07 - 03:34:28:11

Unknown

No further questions. Great. all right, so I want to be cognizant of the fact it is so difficult to be a witness at a hearing. So, I want to do. Would you like a break? Anybody want a break? For about ten minutes. You want to keep going? You're okay. Do you need more water? I see water running out up here.

03:34:28:14 - 03:34:51:26

Unknown

Okay. We have chocolate going up here, so if you if you want some, that's okay. All right, all right, so we are going to move to the Board of inquiry. And, you know, I think we're pretty all familiar with, with how this goes. So I don't need to go or. Go on. we have, you know, we we have till two, but we can keep going.

03:34:51:28 - 03:35:15:12

Unknown

And then, of course, we can go back to the technical panel, back to the parties, and then back to us. At any point, I'm going to yield. Yield, myself, five minutes, to ask questions. I just want to clarify. Mr. Johnson did a great job. on and I want to go back a little bit just so I make sure I understand on the inspections.

03:35:15:15 - 03:35:46:27

Unknown

So spirit, let's start with Mr. George or Mr. Graham on whoever wants to take this in 2023. Spring and summer. What inspections of a fuselage occurred. I know you said there are inline inspections. There's some final inspections and inspections before it goes on to, a train to Renton. But could you, could you go through what inspections were occurring there and then you could also add what changed then.

03:35:46:29 - 03:36:14:08

Unknown

Yeah. So, back at that time frame, their spirit performs and process inspections where the quality inspector throughout the build, there's reference to, they close diameter holes. there's, there's throughout that, throughout that build, there are locations where specific inspections need to occur. and that usually occurs whether it's a close tolerance hole or it's going to be covered by other structure.

03:36:14:11 - 03:36:38:14

Unknown

It's the validation that the build up to that point has been proceeding, the way it should. That includes, some engineering defined shims, structural shims. There are inspections that require the measurement of the gap, the measurement shim prior to the installation because, it can be face surface sealed over, and you will no longer be able to see that.

03:36:38:14 - 03:37:11:00

Unknown

So those in-process inspections always took place. final inspections are when the IP is is put up for sale to be completed. what that usually means is there's in-process inspections throughout that, that process. And then the final is validating that the job in its totality has now been complete. Yeah. Usually you can you can, you know, there'll be more inspection points, at the final inspection, just because it's going to look at the job as a whole.

03:37:11:03 - 03:37:39:24

Unknown

So, those all took place. we, we did have, we there's a lot of, communication about quality alert notifications, quality alert notifications that exist prior to the, the the the, the door incident, quality alert notification. Prior to that, we had something that we called a playbook process, where a quality inspector would look for, very specific things.

03:37:39:24 - 03:38:05:00

Unknown

Usually, they would have been an escape to Boeing. would have been considered to, say, a Green line, a repetitive escape that would be, anything, that had already progressed to a certain point that would then be inspected, at the end of the line prior to the, unit being shipped. then we also had for inspections the fire inspections took place, before the accident as well.

03:38:05:03 - 03:38:29:29

Unknown

And at what point do you is does the rigging of the mid exit door plug occur? The mid exit door plug rigging the it's a the pre rig process occurs at the end of the line. post accident we determined that our planning did not match the process as far as the location, the the procedure

itself was the same.

03:38:30:00 - 03:38:51:28

Unknown

The location where it happened in the factory was not. The planning was then adjusted to ensure that the mid exit door, it's it's pre rigged in the integration location. However it has to remain open due to our commo process. It is then closed, at the end of the line. And that's where the arrestable to install.

03:38:52:00 - 03:39:19:05

Unknown

Okay. And so in that process where you do pre rigging and at some point you close it, at the end, are you checking for any sort of hardware? at that time, in, in you 23, were you checking for any sort of hardware, around the door plug that may have been missing or, not installed?

03:39:19:05 - 03:39:41:09

Unknown

How was how did that happen? So if it was if the the structure around the wall, the structure throughout the fuselage, it it's either it comes from suppliers or it's built with in spirit, any structure that was built up through the IP process, through the Boeing or through the sorry, through the spirit build process. That's where the in process and the final inspections will occur.

03:39:41:09 - 03:40:11:04

Unknown

So that was all looked at. if if a part was received from a supplier with, with designated inspection authority, you don't re inspect that that part. However, if a a let's say a defect or what looks to be a defect or a non conformance, is identified by either a mechanic or a quality inspector. they can go look at that defect, determine whether it's acceptable or not acceptable.

03:40:11:09 - 03:40:36:12

Unknown

If it's acceptable, there's no paperwork written. There's no we don't record, conforming product. if it is found to be a non conformance, we would write up paperwork whether it's, pick pickup or an engineering, tag requiring engineering disposition. Thank you. I have more questions on this, but member Graham. Thank you. Chair. I'm going to start with spirit, and let's go back before the fuselage.

03:40:36:15 - 03:41:07:04

Unknown

Let's talk about the edge frame. Is that man you factor by you or supplier? That is a supplier. Okay. how do you accept that edge frame? and I want to say back, at the time of the accident. Yeah. So the, the edge frame is that supplier has inspection authorization, meaning that they, they have the ability to buy off on the, on the installations or the the entire, the entire build of the

frame when spirit receives it.

03:41:07:25 - 03:41:32:17

Unknown

we will because they're a delegated company. We will. We install the frame. we do not necessarily perform another re inspection of the frame. However, if a defect is noted, it can be again written up and reworked at spirit. Or in some cases, we can bring the supplier in to perform the rework. Okay. But back then you didn't inspect that at all as an acceptance.

03:41:33:09 - 03:41:56:20

Unknown

but if you saw a, nonconformity, you could write it up or do something about it. Yeah. Even if a non conformance is is found, we write it up and we can rework it or we can have the supplier rework it. But we do not necessarily re inspect everything that is provided to us. Okay. has that acceptance process changed at all since the accident?

03:41:56:22 - 03:42:21:26

Unknown

No, the inspection process hasn't changed. there has been a regarding the door frame in particular. we do have, additional inspection points put around the the installation of the mid exit door. Okay. Very good. Thank you. let's talk about the fuselages that you build for Boeing. You basically have two different fuselages that you make for point.

03:42:21:26 - 03:42:48:24

Unknown

Is that correct on the 737 line? no, actually we have 5 or 6 minor models. Okay. Okay. So you have the Max eight and the Max nine. Correct. Do we have a freighter? We have a business jet. I mean, the platforms are the very similar. Okay. So, you, you assemble the six independent sections, so the fuselage and a integration station, I believe you said.

03:42:48:27 - 03:43:14:18

Unknown

Correct. Okay. do you have to have different, jigs for the different size? 730 sevens. Now, the. And you saw in the picture what the system that we have is we call eight, it's, mobile. It moves with the length of the airplane and it has targets on it. and it's all automated, so it knows the different size fuselage.

03:43:14:19 - 03:43:22:15

Unknown

Okay. do the employees know the different types of fuselages that are coming?

03:43:22:17 - 03:43:44:03

Unknown

Yes and no. meaning, are they in great detail? Do they know that they're coming? No, no, but but we have a firing order, and the whole team has a good look ahead on it. Okay, so the, different sized fuselage is coming at you with an I. It would be fair to say with a max nine that to additional door frames are going to be on that airplane.

03:43:44:05 - 03:44:11:11

Unknown

Yes. So articular sec or control station that installs though they're very much aware that those are coming down the line. Yeah. Okay. So these can go on any one of the ten integration. stations. Correct. Yes. So are the employees trained on how to build each different fuselage? Yes they are. The planning paper directs them on, on each one of those.

03:44:11:14 - 03:44:46:27

Unknown

Okay. Has anything changed as far as training goes with the max nine door frames or anything since, the accident. Yeah, there's been again we've we've gone through the process of as designed as planned as built, which is we've gone through the entire thing in terms of sequence and location, like Scott talked about earlier, relative to the door on the door frame, I don't I don't think we've changed, anything relative to the bill or the inspection.

03:44:46:29 - 03:45:09:09

Unknown

Okay. The, I'll ask that in the next panel. let me go over to Boeing right now. Let me ask you about, you talked about flow day one, two and three. and does a 900 go down a different line, or can they go down any one of the three lines? They go down any one of the three lines, all of our minor models.

03:45:09:11 - 03:45:37:02

Unknown

Then the same question is every employee, trained on the differences and what, what they look at differently or perform work on, what they are. Yes. Has any training for that changed since the accident? As I referred to our overall training that has changed our specific minor model training. Training has not per se, but our overall training has changed significantly since then.

03:45:37:05 - 03:45:59:02

Unknown

Okay, great. Thank you. My time's up. Thank you, member Chapman. Thank you. Chair. Miss Lynn, you shared the diagram of, your production lines and, you made reference to the term flow day, which I assume is not literally a 24 hour day. I assume that's sort of synonymous with, workstation or something like that.

03:45:59:02 - 03:46:22:24

Unknown

Is that correct? when our factory is, it's capable of moving at a one day pace. When they originally named it many years ago, when we made the seven, three, seven energy, that's because we lay out our daily work statement such that it could be completed in one day, and then it moves to the next day and the next day.

03:46:23:02 - 03:46:58:08

Unknown

That said, we frequently hold it in a position more than one day. Thank you. and you indicated that the the door plug would be checked initially at flow days one, two and three, and then there would be a final check. I believe you said it flow. Day nine. how detailed would those checks be? And would they include specifically checking to ensure that the bolts, needed to ensure that the plug is held in place are, present and and properly secured?

03:46:58:27 - 03:47:23:28

Unknown

those checks are intended to check for rigging inflow. Day one through three. We check both the inside and the outside. we make sure that the gaps are right, that there's, no protrusions that, that that we check in in general, I don't know if it calls out per se check for the bolts, but I believe the bolts would be checked and noted in day one through three.

03:47:23:28 - 03:47:51:29

Unknown

When you look at the inside and the outside to check that area on flow day nine, that is an external check only. Okay, that is to make sure once the airplane puts its weight on wheels, nothing has shifted and that it's still flush and rigged correctly on the outside so it would not check it flow. Day nine. Okay, so a little bit of an open question, but it sounds like, at the earliest stage, there would there would have been there should be a check for the bolts.

03:47:52:01 - 03:48:19:19

Unknown

Correct. for, for my understanding and maybe for others as well. Three systems that have been mentioned or at least are mentioned in some of the documents. I believe you referred to it is Siemens, the, the Common Manufacturing Execution System. the, ship side action tracker. And then, there's a term line side control center.

03:48:19:22 - 03:48:47:12

Unknown

Can you please describe their relationship of those three systems? and, and the extent to which documents would be captured in any or all of them work? the vast majority of the documents will be captured in, in seamless. That, again, is our system of record. That is where our installation plans are. That is the system that our employees, log in to stamp their job in.

03:48:47:12 - 03:49:10:06

Unknown

That is the system you can use to access the drawings and the specifications. That is seamless. That is our system of record. That is a communication system. That is the system that we use when somebody on the floor needs help. Mr. Catlin gave a great example. There was a plan that needed revision. So you put it in that you ask someone to come and help you get this revision that you need.

03:49:11:08 - 03:49:32:20

Unknown

the the last one is the line side control center, that is a group of employees that sits, in a table, kind of like the one you were sitting at beside a build position in the factory with cross-functional representation there. That is there with some people on the floor who could help the people on the floor real time if something comes up.

03:49:33:09 - 03:49:57:21

Unknown

and so the line side control center is sort of a group of people. The SAT is the system that we use to communicate when we need help. But the system of record that our documentation and our sign off something on will be seamless. Thank you. Now, if there were going to be a removal, something would trigger required documentation, I assume.

03:49:57:24 - 03:50:23:04

Unknown

And that documentation would be captured in Siemens. Is that right? That is correct. Could it also be reflected somehow in in the SAT system, or where might at least the fact that there's going to be a removal, would that be reflected in SAT where it could be referenced in SAP as the need for a removal? or whatever, but the document itself would be housed in seamless, and that's the system it resides in.

03:50:23:06 - 03:50:54:09

Unknown

And then and chair, I have some additional questions. I'm just going to hold until the next round. Thank you. Or member Brown. Thank you. they are clear. This probably goes to Boeing. There are clearly a lot of steps in building a 737 Max airplane. And you say again, how many different facilities are involved? our seven, three, seven Maxs are all built in our Renton, Washington facility there.

03:50:54:09 - 03:51:11:14

Unknown

There are a few different areas of it. As you can imagine, within our Renton site, our wings building, our final assembly building. But they are all located in Renton, Washington. And then they can deliver out of one of two locations. They're built there. They roll out, they get ready to fly, and then they can fly to one of two locations to deliver.

03:51:11:14 - 03:51:32:12

Unknown

One is the Seattle Delivery Center, just a few miles away from Renton in the Puget Sound. The other is our Everett Delivery Center, which is just a few more miles north in the Puget Sound. But they're all that the Boeing build is in Renton, and then the supply chain network is spirit. And as Mr. Ackerman mentioned, the suppliers that we get our parts from.

03:51:32:14 - 03:52:02:25

Unknown

Okay. How many employees are in the production line where the where this aircraft was assembled, both at spirit and when the future lodge arrive in Boeing's Renton, Washington facility? in in terms of, I'll call them production employees, manufacturing and quality employees involved in the Renton floor. I believe there are around 7500 or 8000 production employees in the Renton facility.

03:52:02:28 - 03:52:22:29

Unknown

Okay, I'm going around it to 2000 on the 737 fuselage. Okay. Can you talk a little bit about Boeing's subcontractors in this process and who are they and how they're selected? Mr. Ackerman?

03:52:23:02 - 03:52:52:12

Unknown

So for clarification on subcontractors, are you referring to when we have, a suppliers, employees or suppliers contractor in our production system doing warranty work right. I'll, I'll start by saying that there there's fairly limited examples of where we do that. spirit is one, doing structural warranty work and we identify a defect that was, as a result of, spirit build.

03:52:52:15 - 03:53:21:23

Unknown

We will have, we have a number of employees that are essentially resident in, in Renton. spirit manages those employees. We oversee that work, and we will stamp that work. There are a couple of other areas where we have, similar arrangements where we have suppliers doing warranty work. But I would say spirit is the largest. And you what is that number in terms of overseeing oversight for those employees?

03:53:21:26 - 03:53:55:28

Unknown

You have a number of managers because between Boeing and Spirit you work very closely together. Correct? I we do I don't know the total number we have in Renton off the top of my head, but I would say in total, spirit and all other companies combined would be less than 100. Was there any impact following the divestment investment of Spirit Aero Systems in 2005 on the

inspection, transparency and communication process between the two companies during manufacturing?

03:53:56:01 - 03:54:26:25

Unknown

This is in 2005, so that merger divestment. Yeah, I would say I don't have I was not involved or working in anything relevant to seven, three, seven production in 2005. So I would not be able to talk to changes, over that time period. Okay. What governs, your quality control inspection procedures with Boeing subcontractors that what governs our overall inspection procedures?

03:54:27:09 - 03:54:57:18

Unknown

we have, similar to what Mr. Gray Bond described. We have many of our suppliers that are delegated. that's, where they are delegated to do inspection on our behalf. We monitor that through the audits we do on site. We do. We monitor that through product audits or production system audits. We, oversee that by looking at the data, and we can make changes to that and often do to remove that delegation or put additional or put inspectors at a supplier to do that.

03:54:58:00 - 03:55:27:05

Unknown

that inspection at the source. One of the question, how did you determine the proficiency of the people reviewing and managing that risk assessment? The the auditors that Boeing employees to have, at our suppliers, we, we do training of our, supplier quality representatives. we, you know, we look at the results of the outcomes of that, we look at the results of the audits relative of the defects we're seeing.

03:55:27:23 - 03:55:50:00

Unknown

so we have a continuous, employee proficiency monitoring program. Thank you. Then, for the question, chair. Thank you. Member Inman. Thank you. miss, I want to go back to something, and I'm trying to figure out if I caught it the right way or not. But you discussed that you had ramped up some inspections, but you had decreased some inspections offsite or audits it.

03:55:50:03 - 03:56:12:17

Unknown

My comment was during the verification optimization off the plane. So for example, if you needed to, set up a stand off site. Okay, off the plane, I'm sorry, not offsite off the plane. That is not necessarily a stamp anymore. I, I do want to be clear that the inspections on the airplane are higher, I understand.

03:56:12:17 - 03:56:40:27

Unknown

Well, what about outside of the after delivery? Has that changed in any way? you still stamp

after delivery? The way our our process works. And if I don't answer your question, please help me. the way our process works is we stamp the airplane, in our production certificate up until we it to the airplane, after we take it and deliver it.

03:56:41:03 - 03:57:01:06

Unknown

If we still need to do work on the airplane, we do that under our repair station ticket, much like an airline would do it under their repair station ticket. So it changes from our, you see, 700 build once an airplane delivers to a repair station at that time. Okay. Because the troubling thing I think that came out in the documentation is in regard to removals.

03:57:01:06 - 03:57:29:10

Unknown

Since, April 23rd of 2018, there were 62 instances of a plug being removed, empty plug, but, 24 of them were while they were initiated, while the airplane was in the Renton, but 38 of them on 13 different airplanes were initiated in field locations after the factory rollout, pre-flight delivery center, storage sites. My question is, are we going to solve for a different problem later on?

03:57:29:17 - 03:57:51:19

Unknown

Because we're fixing things in the production line, but I don't know if we're fixing them after they get past your door. Thank you for the clarification. In all of those locations, the delivery center, the storage site and the, preflight, the rollout, the post rollout, they are all under PC 700 and all covered by the same processes and the things we're talking about fixing.

03:57:51:26 - 03:58:13:21

Unknown

All of those are covered by those same processes, the same stamps, etc. would they be integrated on the same, I guess through the same review your quality reviews, correct? Thank you. it was also noted immediately after the crash. and I'm going to point out Alaska was one of the, I think the one of the first it or 121 operators to start a safety management system.

03:58:13:29 - 03:58:34:24

Unknown

they sent someone directly to the to the plant, the auditor. What were the results of that or what were found? Cannot speak to the results of the audit from the Alaska audit in our production system, per se. I, I can't speak to that off the top of my head. Were your team involved with it? We absolutely are.

03:58:34:24 - 03:58:56:09

Unknown

We work closely with Alaska Airlines. they make suggestions. Alaska Airlines has made many suggestions. Absolutely. But you know what they are. Yes. Their chief auditor, has been to visit

us many times. I've personally met with her. I've met with her at Alaska. I've. I've, met with Max at Alaska. I've met with him back at our site.

03:58:56:09 - 03:59:13:16

Unknown

We are implementing them. We've taken those feedback and we work with her and give her updates on all of the improvements that we've made across the board. I think maybe where I'm hung up is I. I wasn't quite referring to that as the exact results of their audit, and maybe that's the word, but I'm working closely with Brooke and with Max on Alaska.

03:59:13:16 - 03:59:37:19

Unknown

On following up on all of those commitments. Okay. Were you the site manager or the plant manager during the time of that audit? I was not who was, the the program manager of the seven, three, seven. the vice president general manager was Ed Clark, and he is no longer with Boeing. That is correct. I just noticed because he isn't in any of our interviews.

03:59:37:19 - 03:59:58:05

Unknown

So I don't know if he was made available or not, but, we'll move on to I'll come back to that probably in a little bit if it's okay to, a couple of just easy questions for right now. What is the door always been? The plugs always been made in Malaysia? Yes. Why? It's part of the spirit supply chain.

03:59:58:05 - 04:00:23:07

Unknown

We have. We have parts manufactured all around the world and how they have capability of building the door. Do you have capability in Wichita? Building a door? we would, we could I mean, spirit spirit manufacturers, we build many parts. we could essentially build probably every single component that goes into a 737, but it's limited by space and and capacity.

04:00:23:10 - 04:00:53:11

Unknown

Okay, I'll wait for my next round. Thank. Thank you. I want to go back to my questions on the inspections you mentioned and process inspections. You mentioned end of line inspections and inspections of of tasks. going back to 2023. And and let me just cut to the chase here on what I'm asking after this occurred, Boeing worked with FAA to develop them.

04:00:53:25 - 04:01:29:25

Unknown

there were inspections of, door plugs on other aircraft. There were, identified incorrect number of washers installed at various locations, clearance and gaps that were out of limits, loose fasteners at various locations, incorrect fastener grip blanks, missing cotter pins and minor

damage to components. So my question is, in 2023, what was in place that spirit to catch that before the fuselage went to Boeing?

04:01:29:28 - 04:02:00:23

Unknown

In 2023 the the work instructions with the work instructions and the in-process inspection were in place. the details of some of the things that that were identified, such as, let's say a shank fastener where it wasn't, wasn't all the way seated, that should have been caught in that. there are requirements that that, you're checking fastener head height.

04:02:01:00 - 04:02:35:20

Unknown

those those are there and those the if those were missed, then it's an escape from spirit. But there was independent of the the mom inspection that you referred to. The mom came in after the incident where additional inspections were, a an additional layer or several layers of inspections were put in place. Understood. I'm just trying to understand, was it a problem with the documents or the instructions or, it was just missed in some cases.

04:02:35:20 - 04:02:59:26

Unknown

Were the instructions clear that hardware had to be in place, that it needed to meet certain specifications? I, I would I would say it's a combination of both. there was a lot of clarity added to the inspections, to look at very specific locations, as opposed to looking at the job. And it's as it's, in totality.

04:02:59:26 - 04:03:37:07

Unknown

So, I would say it's a combination of missed inspections by the, by the inspector, as well as clarification, additional clarification was needed. through the inspection process. Okay. Great. Thank you. And so what is in place now to address that the the inspections are very detailed. Now in regards to, the, the, the, the mom inspection that added the, the additional inspections, those are now incorporated into the spirit inspection process.

04:03:37:09 - 04:04:07:18

Unknown

So there's validation steps. Yeah. There's validation steps throughout the installation and the pre rig and the and the final closure of the door. Everything that was found through the mom process that was needed to be added into the inspection process is now documented at Spirit and Boeing. Is there now to ensure the adequacy of the inspections. before it leaves to go to Renton, correct.

04:04:07:20 - 04:04:32:26

Unknown

But was not before. That is correct. Specifically for the mid exit door. All configurations, plug in door configurations. Boeing does an additional inspection into, on top of what Mr. Gray Bond just shared. And I'm curious what sort of, process. You know, you mentioned the mid exit door plug, but there are discrepancies and defects in other areas.

04:04:32:26 - 04:05:04:17

Unknown

What exists outside of the door plug to ensure those defects escapes non conformance, whatever you want to call it don't occur before they leave. Spirit. We now do. As of March 1st 2024 a full inspection a Boeing inspection. We do it in conjunction with spirit inspectors. But there is a full Boeing inspection over a couple a day period at the very end of the production system, after the fuselage comes out of their factory, it goes back into a different area of the factory where we do that inspection.

04:05:04:17 - 04:05:34:28

Unknown

Any discrepancies are documented in Spirit's quality management system resolved and then re inspected by Boeing in Wichita. In Wichita. So, I'm going to ask both Spirit and Boeing what's your confidence in, you know, percent confidence in this that in a fuselage leaving going to Renton without these types of hardware missing or loose loose hardware, or other sorts of defects.

04:05:34:28 - 04:05:59:18

Unknown

What's your confidence in what you're receiving? Boeing. We have seen, as a result, as as we've put these inspections in place, we have seen significant improvements. And that reflects, insignificant improvements in rework hours that we have in our Renton factory. So we are seeing the, a very positive effect of having those inspections in place. But when they were 100% confident, no problems.

04:05:59:18 - 04:06:25:26

Unknown

We're not worried. We're always going to strive to make sure we have a very robust system. And any risk that we see in that system, we will take immediate action to address it, I think. If so. So the inspection process is a manual process that's there's a human element to it. no matter how many defects Spirit and Boeing find in Wichita, there will be a number that make it to Renton.

04:06:25:26 - 04:06:49:16

Unknown

That's that's just a it's a statement of fact. That's the way the metrics look, on average, about maybe 9%. The defects are are not there. I'm going to say you can never call a defect minimal. However, the defects that are being found now in Renton are not significant. Structural defects

are still we're looking at mainly fastener head height, maybe sealant, things like that.

04:06:49:18 - 04:07:16:09

Unknown

But whenever there's a human inspecting an airplane or anything else, there is going to be a level that you're not going to get 100% a perfect airplane out the door. Thank you very much. Appreciate that. Member. Graham. Thank you. Chair. like to go to Boeing. let's go back. Three accident. you talked about the acceptance of the fuselages when they show up at Renton.

04:07:16:19 - 04:07:49:21

Unknown

and they are inspected either on flow day one or low day zero, as you put it. at the time, who would inspect those? The Boeing, quality inspection team. How many people are we talking about? I don't have the exact number, but I'm going to guess. Ten. Ten. Oh, approximately several people. Yes. Okay. Yes. in any non conformance or defect that is, is conforming would be, I assume documented at that point, correct.

04:07:49:24 - 04:08:11:04

Unknown

Yeah. And those defects that are we don't call them ugly, we call them cosmetics. All right. Yeah, yeah, yeah I work for a manufacturer before. Yes, yes. No. But okay. So any non conformance at that point would be documented. Correct. Correct. Usually an NCR and then an NCO written on top of that most likely for the work to be done.

04:08:11:12 - 04:08:39:29

Unknown

That's correct. And if it's all work that's on that fuselage it came from spirit. you would have spirit work on all of those non conformance is is that correct. By and large. That's correct. Yes. Okay. so we have a non conformance that needs to be worked on. And it's determined that you get to that work. But a medium exit door needs to be removed.

04:08:40:01 - 04:09:05:04

Unknown

So a removal that needs to be written. Is that correct. Correct okay. And what form does that go on. That goes on I removed a removal form which is housed in seamless. Okay. So you got a removal form. And who would write that removal back then in September of 2023. any employee could write a removal form any.

04:09:05:04 - 04:09:32:27

Unknown

Okay. and then that's put into the system. Correct? Correct. Okay. in the case of work being redone or being worked, it's a spirit. Had to do the work. Then a spirit employee or a contractor spirit would stamp off their work and ask for a spirit inspector to buy that work off. Is that

correct? In 2023, the process was such that a spirit mechanic would stamp their work.

04:09:32:27 - 04:09:59:20

Unknown

They would ask for a spirit inspector to stamp their work, and then a Boeing inspector would come along behind it and stamp the work, okay, and then stamp that work. At any point prior to this, I would, say the spirit mechanic know that there was a removal written, and maybe that's for spirit. probably. So, can you repeat that?

04:09:59:25 - 04:10:23:22

Unknown

Yeah. So if, if there's a non conformance where a removal like the door has to be removed so they could they repair rivets. Right. would that employee, that mechanic that goes and does the rivet work in this case. Know that that actually see a removal as spirit cannot perform any work until the paperwork is in place authorizing spirit to touch the airplane.

04:10:23:24 - 04:10:48:15

Unknown

And that would include a removal of the door, be the paperwork supporting the removal, whatever the removal supports. Right. Okay, I might just ask and this will probably be discussed in the next panel typically in my experience. And and we'll discuss it in the next panel as well. Spirit comes and says I need access. And when they need access, for that, they are not allowed to open and close things or things like that.

04:10:48:15 - 04:11:06:10

Unknown

So they come and ask for access, access. And then the Boeing employees figure out what access they need. Do you need to open a door? Do we need to remove the plug? Whatever the answer may be. But they're they're typically ask is for the access, not for the paperwork on our side required for it. Okay okay. Fair enough.

04:11:06:10 - 04:11:41:04

Unknown

And then when it is time for a reinstall, I assume a Boeing inspector would give a, okay to install here. Is that correct? And to reinstall the the the door. in terms of the removal paperwork today, that was one of the changes since the accident. At the time of September 2023, a Boeing instructor, a Boeing inspector, would inspect the final installation and put the final stamp on a removal to when a removal had happened, it had been reinstalled.

04:11:41:04 - 04:12:05:06

Unknown

The inspector would come and give the final stamp. Since that time, we now have the inspector do the okay to, remove up front and the stamp at the end. Okay, so it has changed. All right.

Thank you. I see my time's up. Thank you, thank you. I actually went over, so. Okay. thank you. Chair. for first of all, thank you to all of you.

04:12:05:06 - 04:12:21:06

Unknown

I've learned a lot today and this has been very helpful. We appreciate your patience and your your time. I just have a few additional questions. Member. Graham actually covered a lot of what, I had intended to ask about. so I just I'm sorry to go over this again. I just want to make sure I understand this correctly.

04:12:21:06 - 04:12:52:29

Unknown

So prior to the accident, any employee on the line, was authorized to initiate, a removal and to generate the removal documentation, correct? Correct. And that documentation would have gone into Siemens would have been captured into in Siemens. Right. Correct. And, is there was there then and is there now a way for anyone to remove a document from Siemens?

04:12:53:21 - 04:13:13:10

Unknown

because Siemens is the system of record. Once I will use this term, a job is fired, a job is loaded in the system, it's become active. a job cannot be removed from seamless. Okay. If it's in the planning up front before it's become active. It's something that's planned for a week from now, but it hasn't become active.

04:13:13:15 - 04:13:35:28

Unknown

That can be adjusted. Once it becomes active, it's fired. It's an order on the floor. It cannot be, removed. Okay. And prior to it. So once it's active, it cannot be removed. Correct. Prior to becoming active, if it were removed, would it leave some sort of. On or some sort of footprint? Yes, I believe it would. Okay.

04:13:39:02 - 04:14:13:28

Unknown

And if I could just ask, the folks from spirit, what are your processes that who would spirit would be authorized to, to initiate a removal and to generate the documentation. Does it differ from Boeing's process before and after? Yeah. Manufacturing initiates that removal process. Okay. when I know that there are 20 plus spirit employees at the Renton factory, I believe, is that correct?

04:14:14:01 - 04:14:37:22

Unknown

Member Chapman, can I just clarify, was your question for for, Mr. Greenbaum? Was that at the Renton factory or, Wichita in Wichita. Okay, what's the process? And thank you. Yeah. What I

referred to is Wichita spirit does not right. Removals at the Boeing facility in Renton. And how about at at the Wichita facility? Yeah, in Wichita operations.

04:14:38:16 - 04:15:05:04

Unknown

spirit operations. And it initiates the, the removal process. And I assume you have a a system that's analogous to Siemens. Is that right? Yeah. Yes. We have the Ms. system manufacturing, I just lost my train of thought. That's all right, I think. Execution system, manufacturing execution system. it's the same. It is as a mirror image of of Boeing as as we were once Boeing.

04:15:05:04 - 04:15:44:02

Unknown

A lot of their systems are similar to ours. Okay. Thank you. And thank you for catching that. Yes, I appreciate that. So one last question here, where inspections are performed again, we're back to Renton now for inspections are performed. it's my understanding there are 20 plus spirit employees at Renton. To what extent are inspections done or required to be done by Boeing inspectors versus spirit inspectors, or a combination of the two?

04:15:44:04 - 04:16:15:27

Unknown

I'll take it for now. Boeing inspectors, as I mentioned, did and do the initial inspection of the fuselage when it arrives. as I mentioned before, and September, the spirit employee, when they did rework, would do their rework and stamp it. Their inspector would stamp it, our inspector would stamp it behind it. Since the accident, spirit's, quality no longer stamps their work, their manufacturing stamps, their work.

04:16:16:03 - 04:16:49:07

Unknown

And now a Boeing quality is the final stamp. to ensure that the rework is conforming. Thank you. Is that square spirit with your understanding of the process? I believe that's correct. Thank you. Thank you. Chair. Thank you. Member Brown, just for just clarification for me, based on this is from Boeing. And in spirit, based on what you said earlier about some of the steps in building the airplane, can you talk about sort of the risk assessments, Boeing, please?

04:16:49:09 - 04:17:02:25

Unknown

When the fuselage arrived in Renton, Washington. Just tell me about that process and the risk assessment. Assessment before.

04:17:02:28 - 04:17:25:10

Unknown

To ensure I understand your question, are you asking about, sort of the way we think about risk of the fuselage coming in and what things before 2020? Yeah. So, so the way we would think

about risk is, the first level of risk would be mitigated through our supplier oversight program. We have had people on spirit on site at spirit for a while.

04:17:25:17 - 04:17:45:25

Unknown

But but that risk is exactly why we were doing those inspections. We were taking a process for anything that we had seen as a defect in our build and checking for it, even though we were working every day to get it back to spirit, we were working with them. We were feeding it back. But that's not an instantaneous process, and that wasn't foolproof.

04:17:46:01 - 04:18:25:10

Unknown

So as a layer of mitigation and protection, we were doing that full inspection at Boeing to ensure that things we had found previously were looked for to make sure that they didn't exist again. And if they were that, we would get them documented and fixed. And if I may add to that, I mentioned earlier, my testimony about the escalation we started in, May of 2023 when we framed that the things that we chose to drive Boeing inspections into Spirit's factory were around product level safety, sensitive structure, aft pressure dome, vertical, thin fitting.

04:18:25:10 - 04:18:50:01

Unknown

We looked at across the build where we're where are there, critical structural elements or manufacturing process is that when you're complete with assembly, would make a defect hard to detect. And those are the areas. So was that product safety approach that we use to determine what areas we were going to put inspections in Spirit's factory back in May of 2023?

04:18:50:03 - 04:19:18:29

Unknown

Okay. And where are you now? With which we we continue those there are there are some where we went through a process of, inspecting in some cases 30 in some cases, 50 airplanes. we did not find any defects over the course of that inspection regime. So in some cases, we've, stopped those inspections and we've replaced them with different inspections and then, as I said, as of March, first, 2024, we added a full tip to tail inspection.

04:19:19:06 - 04:19:48:18

Unknown

But those in-process inspections remained and including the including the mid exit door. And at Boeing, we have taken that inspection. We used to do it Boeing moved it back to spirit with our employees at spirit to make sure that the defects get back are fixed prior to shipment. In addition, from a from a risk safety standpoint in this goes this goes beyond the fuselage and beyond spirit.

04:19:48:18 - 04:20:16:14

Unknown

But I think it's important post accident, our engineering team did an assessment and picked several systems that are critical to safety. They were systems such as things that could cause a rapid decompression, a major structural failure, flight control systems. And we have added inspections at the end of the manufacturing process. Most between our first flight and our delivery process, where we would do an intermediate inspection.

04:20:16:14 - 04:20:42:12

Unknown

Anyway, in addition to the mid exit door inspections, where we are going in and inspecting these critical systems as that final set of eyes to make sure that nothing is missing longer term, we're doing complete design build assessments of all of those. As Terry mentioned, that's where you take the design, the build, the planning, the inspection. You make sure there's no latent defects, there's nothing that's not there.

04:20:42:16 - 04:21:10:13

Unknown

And then you come up with mistake proofing design changes. That's part of the design changes I was mentioning on the plug itself that we will be adding, we're doing that across all of our critical systems, systematically as part of our future improvements as well. Thank you. Member. And and thank you. We were talking earlier about the number of employees, in Washington for spirit.

04:21:10:15 - 04:21:27:29

Unknown

And I just want to clarify, you said that there were 20 employees. Is that correct? 20. I said roughly ten. It could be a little more or less involved in the initial inspection of the facility. In a spirit. Oh, I'm sorry, I'm sorry. It's okay. If you want to answer some more. I think you've had plenty about it between 20 and 30 generally.

04:21:28:01 - 04:21:53:05

Unknown

And from there it can go down. It can go up. Okay. and you call those employees? How many of them are actually on Spirit's payroll at the time of the accident or the production? Excuse me? I would say at the time of the accident, they were all contract employees, and they are today, every single person that represents spirit.

04:21:53:07 - 04:22:26:06

Unknown

Yes. But, prior to that, we've had a mix. So it hasn't always been that way. We've had a mix of direct and contractors, let's say back in, 21, 20 pre-COVID. Yes. What was there? I guess it's just obvious question why are there no actual spirit employees in Washington managing all of these contractors? there's a lot of talent in Seattle relative to contractors.

04:22:26:08 - 04:22:55:00

Unknown

They're very highly skilled. They're very mobile. they're they're, easy to attain and easy to release when we need to. that's the biggest reason I think we do need to add that the the person overseeing all the contractors is a spirit direct employee. So there is someone there, I thought from the group, factual report, the overall manager, that one area is and and you'll meet him on panel two.

04:22:55:06 - 04:23:18:03

Unknown

Yeah. Man is sitting at the witness table. I think he's pretty happy. He's still got the job. I believe you'll see him on panel two. Okay. madam, madam chair, I have, two. Sorry for the interruption. With to one request for a break, and we're actually slipping into the next panel. so we could, defer some of this line of questioning to the next panel, perhaps.

04:23:18:10 - 04:23:40:10

Unknown

No, we're going to continue to go. we can take a break real quick. Four. We'll do ten minutes after member Inman is done with his line of questioning. but we're going to continue as long as this panel has. We have questions for this panel. I mean, we've only been going 40 minutes. And with all due respect to the staff, you had two hours.

04:23:40:13 - 04:24:10:03

Unknown

Okay. Thank you. Thank you. We should. I don't want the staff mad at me. Can we take the ten minute break? can we take the 10 minutes to 10 minute break right now? We'll go to 150. I just want to be clear that our job, does not end at NTSB. And we have a chair's call at some point for a fatal highway crash that we're going to have to break for, so we'll just keep an eye on that.

04:24:10:03 - 04:35:48:08

Unknown

But we will come back at 150.

04:35:48:10 - 04:35:55:04

Unknown

Three I think,

04:35:55:06 - 04:36:28:07

Unknown

Okay. To, the third chair. you know, we're. So it's a balance. So we're, you know, I'm. He's taught me that some now and now. so we're going to go ahead and we have, Mr.. Coming at oh, here we go. So let's, keep going and know that member Mahan, had some materials. Will just start

his for over again.

04:36:28:09 - 04:37:05:03

Unknown

Thank you. so we noticed in the in from the, personal factors report, the revisions on have the board persons on boats will soon be moving forward from 2013 to 3. That some. So that sounds familiar. Out of those, 11 really defined how many were. And I can get into it a little bit later. But how many of those were self-identified that you changed just as Boeing's own internal processes?

04:37:05:05 - 04:37:34:14

Unknown

I don't have that exact split out. I know some were, in in I believe the gentleman tomorrow will have all of the details, but I know some at least were okay. And I know you had referenced earlier that you started about three years ago and SMS process. correct. We, started to implement it around 2019, I think, then we really started to increase the implementation and got our voluntary program approved by the FAA.

04:37:34:14 - 04:38:01:22

Unknown

I think last year, 22 or 23 noted that in June of 2023, you, initiated a safety risk management on removal specifically. And it was ongoing and that three actions were actually completed. I think that led to a July 24th quality alert from Boeing regarding documentation requirements. I don't know if those two are 100% related, but everything you said is true.

04:38:01:22 - 04:38:32:05

Unknown

But all of those events happened in that rough timeframe. Yes. Okay. Yes. So if with Quality Alert came out in July of 24, 2023, and yet there was no adherence, obviously sometime in September, what's the process for changing the way quality alerts are actually being looked at and understood? Good question. as was noted before, quality alerts could come out kind of in two ways.

04:38:32:07 - 04:39:02:09

Unknown

Some would be information only, some would require the read and sign. and after this it became clear that a non read sign we needed, we needed more accountability to both in terms of improving the way we communicate, changes in the way we ensure they are received needs to be more accountable. As I mentioned immediately, shortly after the accident, we did put out that read and sign in order to address that very point.

04:39:02:12 - 04:39:39:26

Unknown

And do you feel comfortable that that's getting the point across? I'll be honest. I get a lot of things from our department says read and sign and just open it. That's fair. That's fair. I think we need to do more. I, I think we need to do more. there's there's room for improvement in our removal process in terms of simplifying the process itself, in terms of fixing some of these additional steps, and in terms of ensuring our employees understand one of the things we are also now starting to work on.

04:39:41:12 - 04:39:59:07

Unknown

Lloyd had mentioned that in the initial training, there's not much training. That's another change that we've made to FTC is to put some of this BPI training in there. How you access it, what you do, that's a gap that we found as well because it was real. We are working on this issue and I think more work to be done.

04:39:59:10 - 04:40:27:04

Unknown

Well. I think everyone here would agree there's always work to be done. But but I'm going to go back to, the written facility in regard to some FAA audits from October 20th 2nd to September 2023. So roughly a ten year period that there were 68 alleged noncompliance documented with the FAA. ten of them were regarding document control, handling and storage, ten design control, one.

04:40:27:07 - 04:40:49:16

Unknown

But, they were none of them were about the Boeing process part or assembly removal. So I guess I'm just trying to tie this into a bigger picture. I know you mentioned that we had work to do on the door assembly and removal. I'm getting the impression there's work to be done everywhere. Correct. We we have taken that history of our audit findings and our most recent audit findings.

04:40:49:16 - 04:41:30:04

Unknown

As I mentioned, the SA, the FAA, that roughly 24 inspectors in our factory for about six weeks on all three shifts and did a comprehensive audit. And we've taken those findings as well. And all of those are in our efforts to go improve our processes and understanding how way to the next round to, thanks very much. I want to return to something that the technical panel asked about, just to make sure that our factual is, correct, because I, I feel like I heard something different from Mr. George about lubricant used.

04:41:31:00 - 04:42:00:06

Unknown

currently, we understand lubricant has to be used. So I'm just going to read this to you to make sure that it's accurate, factual information. On January 17th, the investigative group went to

spirit. this was in 2024, prior to, a, and mid exit door plug, being closed on a different fuselage. The installation mechanic was observed using a lubricant, which was Vaseline.

04:42:00:06 - 04:42:25:03

Unknown

And, when asked about it, the spirit AeroSystems produced an engineering evaluation that stated the use of Vaseline would not negatively affect the aircraft. I just wanted to make sure, was that your document? Was that Boeing's document? was that something Boeing signed off on?

04:42:25:06 - 04:42:51:20

Unknown

I'm not familiar with. your comment on it wouldn't harm the airplane, although I agree with it, but I'm not. I'm not familiar with that. So therefore I don't know where it came from. Is there an engineering evaluation? Regardless of what it said, that spirit produced our employees. about the use of allowing the use of Vaseline. What I said earlier was starting this may.

04:42:51:22 - 04:43:14:20

Unknown

There is a green Line engineering green line. I don't I don't I'm going back in time. Yeah. I mean, was there a document that you produced to our employees on January 17th when the investigative group went out? That's that said, an engineering evaluation that said Vaseline could be used. Did you did you provide that to our personnel?

04:43:14:21 - 04:43:45:07

Unknown

No, not that I'm aware of. So that's you're saying that's not accurate? I'm saying I'm not aware of that. Oh. So that might have might exist. You just you personally do not know. All right. Okay. Just wanted to clarify. we reviewed engineering data and, saw a note allowing the use of dish soap, not Vaseline. Are you aware of that?

04:43:45:09 - 04:44:12:18

Unknown

Not specifically. and again, I don't know where the origin would have would have been where they came from. Okay. Miss Lund or Mr. Akerman, do you allow the use? Was it were you aware that they were using Vaseline versus dish soap? not at the time before the accident. Post accident? as as we were, observing the build of the the mid door had the same observation.

04:44:14:12 - 04:44:37:14

Unknown

over the next couple of weeks, there was a separate engineering evaluation that I was aware of, concurred by, I believe, Boeing engineering to allow the use of dish soap. And that, I believe, is what, Mr. George is referring to, which was added to the to the build plan later. Yes.

Understand? Dish soap. I just wanted to make sure there was not some sort of discrepancy.

04:44:37:14 - 04:45:06:16

Unknown

Do you ever find discrepancies in documents between Spirit and Boeing on what is approved? Yes, we do, and then you work through that and then we work through that. Yes. Okay, great. I just wanted to understand that, for spirit, you have three contractors launch technical workforce Solutions, Aero Tech Aviation and strong. This includes, director of customer relations who oversees four managers, 20 mechanics and two quality assurance personnel.

04:45:06:28 - 04:45:36:05

Unknown

what's the relationship, between how how do you ensure oversight spirit of the three contractors and then Boeing, how do you ensure oversight of spirit and three contractors? Okay, I'll start with spirit. Yeah. So for the for the oversight, Madam Chair, I'm. I don't think we can talk to the details until panel two. Penalty. We'll talk get more in depth because, our witness will is the over.

04:45:36:11 - 04:46:05:12

Unknown

Okay. The manager of those people, I think I'm afraid an accurate answer. Totally. Fine. We'll come back to that then. quick question, because I, two questions. you have lockout tag out or called lotto when you go to a bar, you and you can you talk about that really quick when you when you, you go to a barge, which is essentially a work area, you have lockout tag out where you use a badge to, to come in and come out, explain that for a second.

04:46:05:14 - 04:46:26:26

Unknown

Sure. There's there's two processes related that I think you're talking about there. The first is in any position in the factory, when an employee who doesn't normally work in that area every day isn't an assigned in that area, they use their badge to enter the area, and then they use their badge when they exit the area. And that provides a level of visibility or control of who's there.

04:46:26:29 - 04:46:48:00

Unknown

It is related to lockout. TAC out like a tag out is a process we use once power goes on the airplane and it's a live airplane. So when you, use your badge to enter an area that's a live airplane, there's a, position called a GC who educates you and informs you powers on the airplane. It's off on the airplane.

04:46:48:06 - 04:47:04:19

Unknown

If you need to do work in an area, they make sure that there's no power in that area you're working in. That's how we control the safety. And that's why we one of the many reasons why

we do want to know when someone goes in an area so they can be briefed, and we can ensure before work starts in an area that it's safe for the person to work there.

04:47:04:22 - 04:47:26:15

Unknown

Okay, great. I have more questions on that. Member Graham. Thank you. Chair. Mr. Catlin, I didn't mean to be out two rounds ago on the, question I had on training for employees at Renton, on the different models of the 737 back. prior to the accident, do you feel there was enough differences training for the employees to do the work on the different models?

04:47:26:18 - 04:47:47:28

Unknown

Well, when it comes to training, I think there's two things that need to be looked at. There's training under part 21 of the Code of Federal Regulations and part 25 of the Code of Federal Regulation. Part 25 is the engineering side of the House. That's where you get your training on your back, engineering drawings, your back specs and how you build the airplane.

04:47:48:00 - 04:48:24:00

Unknown

The training under the part 21 side of the house is on the pros, policies and KPIs that we follow when we build the airplane. Back in September of 2023, our foundational training center was in trouble. We had so many new people coming in, they were being pushed through. We were seeing about a 60% failure rate coming through, foundational training of people who were being hired, who couldn't complete the training, and they were being terminated from the company due to not being able to pass their certification classes.

04:48:24:23 - 04:48:53:08

Unknown

to create a, a good solid, functioning mechanic or quality inspector just because you send them through a class and you get them a certification does not mean that they are skilled at performing that activity. using bonding ground, for example, bonding and grounding is a critical part of the aircraft build. And our bonding and grounding processes are broken up into 20 different specifications.

04:48:53:11 - 04:49:20:27

Unknown

So for somebody to go through a class that teaches them how to do 8 to 7 bond or to do a six fascial bond or a Fe bond, doesn't mean they're actually skilled at going out and being able to accurately perform the work, but they are certified. so I do think that there we need a lot of work in our part, 21 side of the house and training and back specifications, PD product definition data.

04:49:21:00 - 04:49:54:14

Unknown

But when it comes to actually training people in our base, in our, policies, pros and epis, that's we need an extensive revamp of that training at the Boeing Company. Thank you for that. turn back to, Miss Lund, since you come from the quality organization, there's been some discussion about travel, work and all that. I assume you you probably have some pretty good metrics on knowing what your primary drivers for travel work are, but would that be a fair assessment?

04:49:54:21 - 04:50:26:06

Unknown

Yes. Is supply shortage one of them? Yes. Does Boeing ascribe to lean manufacturing? Yes okay. Thank you. That's all I have chair. Thank you. Thank you, member Chapman. No further questions for this panel. Chair. Thank you. Member Brown no further question for this panel. Member Inman I do apologize. in fact, Miss Lund, just to ask, this is a it's a great title.

04:50:26:06 - 04:50:57:11

Unknown

I know you've had a lot of questions. It's probably not been a great couple of months. things have been challenging. Yes. Who who did you take over your role from? I took over my role from Carol Murray. And Carol Murray had the same portfolio that you did. it was not exactly. She obviously didn't have the improvement plan activities that I have now because it was prior to the accident for the most part of her tenure.

04:50:57:26 - 04:51:29:18

Unknown

but in general, she had a similar responsibility. What were your roles before this? My role before this, most recently was the leader of all of our airplane programs. So the leaders of the three, six, seven and eight seven programs reported up to me. So that was also the 737 Maxs. Correct, and I apologize. I guess I just want to because I want to bring up if we can, one of the exhibits, I think it's 11 a.m..

04:51:29:21 - 04:51:41:00

Unknown

What about page 604?

04:51:41:02 - 04:51:44:29

Unknown

Maybe.

04:51:45:01 - 04:51:52:23

Unknown

A member Graham was asking about lane processing.

04:51:52:26 - 04:52:13:08

Unknown

To make that a little larger. Is that possible? This is the, the interview of James Phoenix, who was the manager of the Boeing certification from the FAA. He had retired, I believe, in December of 2023. and actually.

04:52:13:10 - 04:52:41:29

Unknown

Do we have the right page pulled up real quick? So for. That six oh, okay. The next page that's 603. Thank you. Sorry bro. Up a little bit early. So talking here about how I changed quite a bit. I wanted to comment that before he took over from 2015 to 2017, a couple of ex Toyota managers that were brought in to try to build the airplanes the way Toyota builds cars.

04:52:42:01 - 04:53:04:12

Unknown

I think that's at lean manufacturing discussion. And if you'll drop on down, please. they were not successful. and then he goes on to talk about we embarked on a significant program to get them to put inspections back in, and we did that through compliance and legal enforcement. They complied with all that. But slowly, very slowly did they reintroduce quality inspections.

04:53:04:15 - 04:53:23:24

Unknown

And that didn't really change. We'll go to 605 until the max accidents were brought a lot of things. But I think the big quote out of that, you need a lot of leverage to get Boeing to change. And then when Boeing changes, it's very slow. And it took a long time for them to really understand it. Their quality system needed to improve.

04:53:23:27 - 04:53:39:18

Unknown

I guess my question is, Miss Allen, is this a cycle that we're going to see every 2 or 3 years or every four years to where we have to come back and look at a different thing? I'm not trying to put you on the spot with that, but it seems to be a recurring trend in men. I feel like that's a fair question.

04:53:39:18 - 04:54:12:13

Unknown

We are committed that this will not be a recurring, a recurring trend. I, I will clarify just a couple of thoughts. We have been on a lean manufacturing journey for quite a while in Boeing. and in fact, the 737 program, and more than five years ago, seven, eight, nine years ago, really was our leader in lean manufacturing in the company.

04:54:12:16 - 04:54:45:08

Unknown

And at that time there was, there was really good performance or quality numbers or quality defects were down. our, our supplier shortages were down by the metrics we talked about

earlier. You would have seen really some pretty robust performance. We got away from that over time. So as it mentions the two executives that were brought in, they did, they did work on several initiatives, but I just wanted to counter that.

04:54:45:12 - 04:55:04:27

Unknown

Lean has been with Boeing for a while. We really do believe in lean. One of the premises of lean that we really believe with is the number one way to improve lean is to improve quality. Those two are integral and we believe in that. So I'll just wanted to clarify that in terms of having to see this again, we are committed that you won't.

04:55:06:01 - 04:55:33:07

Unknown

Administrator Whitaker has asked us many times, what is our sustainment plan? How how can he and his team, many of whom are located here today, be sure that this won't be overturned in a few years, that these things won't be taken away. And for each aspect of the changes and improvements we're trying to make, we have given some metrics in a sustainment process.

04:55:33:09 - 04:56:06:19

Unknown

And as I mentioned earlier, part of the basis of it will be command media. The FAA will have approval authority of that command media. That's one of the elements. the SMS system is one of the elements it's becoming required is, as I'm sure the committee understands in the future, but we're doing it voluntarily already. Use of that for the changes of our processes will be another method that we are continuing to work on these these areas that will give confidence both to us, but to all of you and the FAA as well, that that these changes will stick.

04:56:06:21 - 04:56:34:00

Unknown

And I make one suggestion do or please stop talking about leaner and quality and start talking about safer manufacturing. I agree agree my time's up ma'am. Thank you. Thank you very much. when investigators asked the Boeing executive about quality assurance on the 737 line, he said that supplier performance was the number one issue. We dug a little deeper and asked about whether that was from a quality perspective or a shortage perspective.

04:56:34:00 - 04:56:59:26

Unknown

The response was quality spirit. And I'm quoting here it was the number one driver in terms of number one, defects in the production system, defects non conformance is escapes was not an unknown issue. Manufacturing defects in fact were well known dating back to 2018 2019 as reflected in numerous Boeing internal audits, FAA audits, and interviews with your own employees.

04:56:59:29 - 04:57:23:23

Unknown

In fact, in 2019, FAA found Boeing failed to adequately oversee its suppliers spirit to ensure they complied with the company's quality assurance system. I you know, I have to say, when we went through the transcripts, it was pretty striking to me. And I'm just going to read a few 1 in 1 Boeing employee, not a contractor, said planes come in jacked up every day.

04:57:23:25 - 04:57:58:20

Unknown

Planes come in jacked up every day. Every day. Meaning you're you were at the time receiving, quote unquote, jacked up planes, all the planes that another employee, all the planes that come to us always have an issue with structures, skins, open holes, another employee said on questioning of our, investigative team. If you had think of your family tomorrow, you got on an all X, got an all expense paid trip or wherever dream to wherever your dream vacation is, and you can package up your family and you can go there.

04:57:58:23 - 04:58:26:02

Unknown

And you knew you were flying on an aircraft that had come out of this facility. How would you feel about that? You responded 70%. I'd be worried. 70%. I'd be worried because I know I work inside here. In fact, you stated, that there is a history of knowing quality assurance concerns with spirit. Would you agree with that, that you this has been a known issue with defects.

04:58:26:04 - 04:58:49:23

Unknown

Non says escapes. Is that correct. Yes or no. Yes. Yes it was a in fact I, I'm a little bit I think I'm a and we can get into this and I'll let you think about this question in the next round. You stated we know there have been quality escapes. We know there are documented lack of documentation removal issues.

04:58:49:23 - 04:59:07:02

Unknown

Just out of an abundance of caution, put end of line inspections in place. You know, I just want I just want to understand why not earlier. But actually, before I do that, can we pull up the KPIs?

04:59:07:05 - 04:59:37:29

Unknown

And I'm going to ask, you know, while that's being pulled up, employee proficiency is one of this was part of this, you know, comprehensive 90 day plan that FAA required KPIs. First one is employee proficiency while Leon pulls that up employee proficiency. So we had various production rates. And I will just say and looking it looks like, you were at 26 per month at one point around 2131.

04:59:37:29 - 05:00:08:03

Unknown

And at some point you were up to 42. Or granted, that was down to 50 from 52. so production rates were kind of up and down. And then you had employee turnover, massive employee turnover, especially after Covid, that's documented throughout the exhibits. so you obviously indicated there were some training issues. This is all information that Boeing has been collecting and has seen over the course of a number of years.

05:00:08:03 - 05:00:34:06

Unknown

So concerns related to we have a new workforce. And believe me, we're we're seeing that to here you have a new workforce. You have training issues. Would you agree that was something that was evident for years. Yes. Since Covid. Yes. Okay. So we've all we've talked about supplier shortages escapes escape ments and rework. So that's something that has occurred for years.

05:00:34:08 - 05:01:00:08

Unknown

Yes. Yep. Rework hours per airplane. Obviously you have a number of reworks that has been documented for years. You have had traveling work in the factory, correct? Yes. Travel. and then defects at time of ticketing. So obviously, you know about the defects. I guess my point is here, these are all known issues. They've been known for a number of years.

05:01:00:10 - 05:01:23:17

Unknown

This is all information that has been fed into Boeing. And now it's part of this. This is your these are your KPIs to ensure and to know the health of your production. How do we know these are the right numbers? If they were already available to you for years? we look at many, many metrics as you could well imagine.

05:01:23:17 - 05:01:50:05

Unknown

Well, beyond these six we have, we have, metrics that go down to various levels of the organization that roll up to here beyond this. and we have worked on improving these metrics for years. we would these are the ones we watch. we would love for things like rework ours, escape our supplier shortages to be zero.

05:01:50:09 - 05:02:21:10

Unknown

That, of course, is the target. I don't think that will happen in aerospace. some defect could happen. We have a system that will make sure it's okay. So we will continue to work on these. We will continue to work on driving them down. What it what our conversation really was across Boeing and then with our, our regulators at the FAA was here is a handful, six metrics that can

represent and tell you how our overall health is.

05:02:21:17 - 05:02:42:18

Unknown

It's a window into the production system without having to look at 100 or 200 metrics that we can spread out across. Everyone that says, are we operating in? Are the control limits of our, baseline system, or are we out? do just I don't want to imply that we just started working on these. We have not they have been available and we have worked very hard to continue to drive these down.

05:02:42:25 - 05:03:06:27

Unknown

May I ask one follow up question to colleagues? Okay. Yep. So these are metrics you've had for a number of years. They have existed. Why does it take a door plug coming out of a plane to now say, hey, these are the metrics. This is how we're going to determine health. We've got a serious tragedy that occurred. How do we know this is the fix?

05:03:06:27 - 05:03:35:13

Unknown

This is it. This is how we're going to ensure, you know, system health. I, I think what's changed is small changes to each one of those, but putting them together as a package and saying it's really the control limits, using the control limits as part of our safety management system, triggering a safety risk assessment when we trigger one of these upper control limits so that we have a mitigation plan, we have a safety risk assessment.

05:03:36:08 - 05:04:03:22

Unknown

and then allowing the providing the FAA full access to this in the system that they have access to, they can see the safety risk assessment. They can see the mitigation plan, they can see performance to the mitigation plan. We're continuing to improve it. But it's it's there. It's 100% transparent. It's agreed to with these control limits with an agreement of when something hits this level, action needs to be taken.

05:04:03:22 - 05:04:26:27

Unknown

It'll be documented here. And in that it can be seen real time. a follow up, but I'm going to I'm going to let, first check. Nope. Perryman and I, I know I'm standing between everyone in the lunch. I've been trying to be helpful with the bathroom breaks. Yeah. so actually, Doug, we're going to go down the road a little bit.

05:04:26:27 - 05:04:46:19

Unknown

That's okay. one thing that we learn about, and every one of these incidents are a lot of other

things that went right. And what went wrong in a spoke earlier that we're not going to talk about the actual day of the incident, but a six year old unaccompanied minor, if you read into the report, is donned his own oxygen mask, was sitting there quietly.

05:04:46:19 - 05:05:12:07

Unknown

He wasn't filming on YouTube anything. So hats off to that child. What I'm concerned about is we also learned during that is that from 2009 and two, 2019 to 2020, three, incorrect parts were being put on not only all the maxes, but I believe the MGS. Approximately 680 airplanes in regard to the strips that hold the oxygen canisters in place.

05:05:12:09 - 05:05:37:19

Unknown

Are you aware of this? I am aware that there was a change to the actual engineering of the passenger service units, and that that changed the parts that we were being produced or produced, conforming to, to the engineering of the passenger service units at the time. We are aware that, we had fleets re fleet reports that there was migration of the oxygen bottles on the passenger service units.

05:05:38:03 - 05:05:55:22

Unknown

that was pre, accident. That was in 2023, I believe it may have been 2022. we had taken action to reverse that design change. Our engineering team took action to reverse that design change. and we had put an alert out to the fleet, so I know it was not. So it's a nonconforming part. Is that correct?

05:05:55:23 - 05:06:26:02

Unknown

It was a conforming part. It was conforming to the engineering, but it wasn't working. Right? Correct. That's that's why the engineering change was reversed. And I guess back to the question is if we're going to take immediate action on things. This was first reported in April of 2023 by one operator who was doing a pre inspection Pre-Delivery inspection and then reported again later in that year and then was found in this instance, I believe, in the Alaska 1282.

05:06:26:04 - 05:06:49:10

Unknown

Every one of the oxygen generators except for two had migrated out of their position. Now, luckily they worked, but every one of them, two. It wasn't until approximately April of 2024, over a year after the first report, that a draft mom went out and that was only because an ad was coming from the FAA. Why does it take so long to make a change?

05:06:49:13 - 05:07:14:09

Unknown

Whenever it's just simple things that people need in an emergency, like oxygen? I don't have the details on that particular investigation. I know that the investigation started and it reached the conclusion in 2023, a few months after the initial report and the design change had been implemented, shortly thereafter. But if you're in charge of the supply chain, you weren't ready in on why that needed a change.

05:07:14:12 - 05:07:35:16

Unknown

I was not directly. I was our safety organization, our engineering organization were leading that investigation, but it had to do with the supplier parts or in general, are you made aware whenever there's a safety issue that involved supply? I was aware of that, of that report and, that there was a need for a design change to revert the design back to the original configuration.

05:07:35:19 - 05:07:57:12

Unknown

But you weren't aware, sorry. Earlier you said you weren't aware of this investigation. I wasn't aware of the details of that investigation. It wasn't where that specific timeline on that investigation. I was aware that there was an active investigation that resulted in having to change the design back to the original configuration. So one of our operators comes to you in two separate situations and says, we've found a far issue.

05:07:57:12 - 05:08:22:05

Unknown

Shouldn't that trigger an alarm? Because it looks like the investigation didn't happen until those oxygen canisters came in to NTSB, basically into our possession. And they were noted in the chairman's in the chair's report about a month later. I believe those went into our, safety process. There was, what we call a cost burden that identified the potential for a risk, the potential for a safety issue, a potential for a risk.

05:08:22:07 - 05:08:40:28

Unknown

And that went through the safety process and ultimately, was determined safety, which drove the which drove the action. both for production and into the fleet and whenever, the whenever the safety bulletin went out. How many do you have the rough facts, how many actually had to be changed out or how many were. I don't have it.

05:08:41:02 - 05:09:10:09

Unknown

I don't have the data on that. Now, can you get us get that for us I can, yes, thank you, thank you, thank you. I just have, one question and the rest of my questions can go to the next, panel. But again, I want to make sure everybody gets their time to ask questions. Just, miss Miss Lund, I read in your June 25th press remarks that as a result of the new pre-departure inspections, that you have seen up to an 80% reduction in defects.

05:09:10:09 - 05:09:44:15

Unknown

I'm just curious, 80% of what what would that do? You did you track the number of defects that you were seeing? These are these this is the pre inspection coming out of spirit that those we're finding here. Yep. So although the numbers may be similar for the inspection, but because we're catching them at spirit and reworking them at spirit, when we get the fuselage here and we do the review and write the detailed pickups, that's where we have seen the reduction going that we've made significant improvement through this process at spirit.

05:09:44:17 - 05:10:11:08

Unknown

Understand. Do you have so what was the total you were seeing the At spirit. Were you tracking how many defects were occurring before this process, or even up to the end of line inspection that you just created at spirit? We weren't tracking it prior to this process and prior to the implementation of this process. We were not tracking that then, not the internal spirit findings.

05:10:11:15 - 05:10:32:07

Unknown

by spirit quality. Correct. So 80%. So what was the 80% based? I'm just confused. No. Off the inspection we were doing here in Flow day 0 or 1 that we were finding here. So it's a flow day one to flow day one comparison day one when we weren't inspecting at spirit compared to flow day one after the inspection and rework at spirit.

05:10:32:13 - 05:10:57:24

Unknown

Okay, so then what was the total in flow day one that you were seeing? What's the 8,080% of what it? I have not refreshed myself on those numbers. What I will say is they they varied widely on fuselage. The fuselage and I have not reviewed refreshed myself on the exact numbers. Understood. Okay. I will move the rest of my questions to the next panel.

05:10:57:24 - 05:11:25:24

Unknown

But member Inman, if you have questions, go for it. What's for lunch then. Okay. All right. So we are going to break for lunch for a couple of us. We have conference room one of the conference rooms for the chairs call about a particular crash. And so we'll move to there real quick before we have lunch.

05:11:25:24 - 05:11:29:12

Unknown

So we have.

05:11:29:14 - 05:11:57:28

Unknown

I said it was a highway crash earlier. Yeah, yeah, yeah. so, we will break for, one hour. We will come back at 330. Does that work for everybody? Yes. Good. Go eat. I know it's late. Eat a lot, but don't fall asleep when you come back.

05:11:58:00 - 05:12:35:22

Unknown

And thank you to the first panel of witnesses. Appreciate it.

05:12:35:24 - 05:15:18:10

Unknown

So.

05:59:43:12 - 06:02:23:19

Unknown

So.

06:13:12:01 - 06:14:05:23

Unknown

For the witnesses. For panel two. Here. If witnesses for panel two are here. If you can make your way up. But we've got to, Doug is changing around the. Names as we speak.

06:14:06:09 - 06:16:07:24

Unknown

I'm gonna, hope the media room can hear me and see if there looks like they're all waving. Perfect. did anyone leave a purse up here at all? Just want to make sure it was Dave's.

06:16:09:13 - 06:16:18:21

Unknown

Puns. CMS.

06:16:28:21 - 06:17:59:16

Unknown

yeah. I'm, I'm the one shows I've gone out for portion of lunch.

06:17:59:19 - 06:18:08:14

Unknown

All right. We're gonna go ahead and get started. Okay, great.

06:18:08:16 - 06:18:41:15

Unknown

So, just, a little bit of a chain here. member on is launching, to a great crash in Florida. so our hearts certainly go out, to those that were involved and, we will be thinking of them and then,

certainly think of, member Browns. He as he travels to, so he has passed his queens on to us.

06:18:41:18 - 06:19:11:27

Unknown

Our work doesn't, unfortunately. Lee and, so he will be doing that and take over his questions, throughout this. But you might be on those questions. So, Mr. Barry, will you please begin the introduction and swear in the, witness? Thank you. Chair. Harmony. The second panel address events surrounding opening and closing of the mid exit door.

06:19:11:27 - 06:19:50:06

Unknown

Plug. The panel will cover Boeing 737 Max nine production specific to the accident. Airplane. The lack of documentation of the mid exit door plug being opened and closed. The removal and reinstallation of the mid exit door plug at Boeing Task Management. Description of flow and component travel during assembly, assembly line flow pace and how it's determined.

06:19:50:09 - 06:20:26:03

Unknown

Procedures for reporting and addressing discrepancies, anomalies or concerns from the floor on up at Boeing and Spirit AeroSystems. What can be learned from the ship side action tracking for the accident airplane. The role of spirit AeroSystems employees in the Renton in Renton. Staffed by Aerotek, Strom Aviation and launch and changes made following the accident. The NTSB Technical Panel to my right is composed of.

06:20:26:05 - 06:21:10:01

Unknown

Mr. John Level, investigator in charge. Mr. Piccolo Cruise, lead aerospace engineer. Mr. Nils Johnson, aviation accident investigator for maintenance. And doctor Sabrina Woods, senior human performance investigator. Witnesses for panel two include Miss Elizabeth Lund, chair, quality operations counsel, quality operations counsel and senior vice president for quality at Boeing Commercial Airplanes, and Mr. Michael Riney, senior manager for manufacturing general support at spirit AeroSystems.

06:21:10:04 - 06:21:39:04

Unknown

I now ask that the witnesses not previously sworn in, please stand to be sworn in. Raise your right hand. Please answer by saying I do. Do you swear or affirm that the testimony you will give in this hearing will be the truth, the whole truth, and nothing but the truth. Thank you. Please be seated. As a reminder to the witnesses, you will remain under oath until the conclusion of the hearing.

06:21:39:07 - 06:22:03:02

Unknown

We ask that you answer questions factually and avoid analysis. Finally, please push the microphone button to talk and push it again. When finished. Jerry, how many these witnesses have been pre-qualified and their respective experience and qualifications appear in the docket as exhibits? I now turn the questioning over to Mr. Cruz.

06:22:03:04 - 06:22:14:24

Unknown

Give Mr. Raisi, Mr. Rainey, what are your roles and responsibilities as the spirit AeroSystems Senior Manager, Manufacturing General Support?

06:22:14:26 - 06:22:55:02

Unknown

Yes, I work onsite at the Boeing Renton facility. I'm a liaison liaison between the Spirit and Boeing teams. daily, I perform my involvement with the Boeing teams at their morning meetings, general meetings. And, I also communicate any concerns from the Boeing team or help needed. Conversely, I also, if there are help needed from the spirit team, I work to communicate those items and help.

06:22:55:15 - 06:23:28:21

Unknown

it's a more of a customer relations type role, working with between both teams to help integrate and communicate. There's a, sorry, there is also, support team, spirit contract managers and spirit mechanic contractors that report up through me. Thank you. Where was the left hand mid exit door plug manufactured for fuselage 8789 Subang, Malaysia.

06:23:28:24 - 06:24:05:26

Unknown

Were there any issues during the manufacturing of the left hand exit door plug in Malaysia? None that I made aware of. No significant issues. When did spirit receive the left hand mid exit door plug on it? 8789. There's an exhibit, that we like to share. It's a spirit timeline that would help with referencing those dates.

06:24:05:29 - 06:24:22:26

Unknown

So as you can see by the timeline created by spirit, the plug was manufactured by Spirit Malaysia March 24th. It was received into Spirit Wichita. May 10th.

06:24:22:28 - 06:24:50:02

Unknown

Of 2023. Was there a receiving inspection, for that plug when it got to Wichita? No. The inspections would be performed by the Spirit to Malaysia team during the build. How do you know? How does spirit know that there weren't any issues during shipping?

06:24:50:04 - 06:25:20:06

Unknown

During the UN creating process, if any items were identified, by the mechanics once it was transported to the area for installation, the spirit mechanics were quality personnel have the ability to, elevate those, to area QA to have documented. One was the left hand exit door plug installed on 8789.

06:25:20:08 - 06:25:28:00

Unknown

If you could pull up the timeline again, I believe it's reference. There.

06:25:28:02 - 06:25:41:20

Unknown

I don't see a reference on that timeline, but it will. I believe it was, in the September of 2023 timeframe. I can get the exact date and later.

06:25:41:22 - 06:26:14:24

Unknown

Do the installers of the mid exit door plugs need special training or certification to install the plug? No, there's on the job training that, the spirit personnel in Wichita go through. to understand the installation and ensure that they were following the IP installation plan. According to spirit production paperwork, the left hand exit door plug is pre rigged.

06:26:14:27 - 06:26:24:29

Unknown

When that leaves Wichita, what does Pre-Read mean and when is the final rig accomplished on the middle exit door plugs.

06:26:25:01 - 06:27:06:01

Unknown

Pre rigging involves working to a rig document. there's a drawing sheet number identified. in that rig document. And we, we follow all of the inspections or gap requirements, related to the rig document, but we do not perform the final rig. the final rig is under certain. the fuselage itself has to be in a in a certain configuration before final rig can be performed.

06:27:06:03 - 06:27:50:06

Unknown

And what configuration is that with the wings joined to the aircraft and the aircraft weight on wheels, I believe engines may also have to be installed at that point. What type of inspections are accomplished on the mid exit door plugs? Upon installation? There are fit and fair requirements on the exterior, which are the outboard or inboard. The plug is from the fuselage cut out and then there is a gap requirement around the circumference of the plug.

06:27:50:08 - 06:28:19:01

Unknown

Also in the cutout, there are multiple other gap requirement inspections that are performed common to stop fittings. on the interior. and then of course the the final installation and ensuring all hardware are installed. I'm sorry, Mr. Cruz, could you yield for a second just because we're on this subject now and we're kind of talking about it up here, and we don't want to come back to it.

06:28:19:04 - 06:28:28:04

Unknown

What happens during pre rig. What happens during rigging. And is that done in Wichita.

06:28:28:06 - 06:28:54:13

Unknown

So pre rig is just ensuring all of the requirements from the rig document are met. prior to shipping from Wichita. Because there are configuration changes to the fuselage a final rig has to be performed at Boeing in Renton.

06:28:54:16 - 06:29:25:00

Unknown

Were there any issues? in the installation and pre rig of the left hand mid exit door 87 and 89. Well in Wichita. Boeing performed rig verification on the unit when it loaded into the factory in Renton. There were no defects noted on the left hand. And that I believe that IP for Boeing closed out on September 5th.

06:29:25:03 - 06:30:05:12

Unknown

Thank you, Mr. Johnson. Good morning. Or afternoon? Sorry. my questions are for McRaney. At this point. Mike who for? Mr. Ronnie, who fabricates the edge frames for the 737 medi plug a fuselage opening. I'm sorry. There's a, supplier by the name of Quick Tech that manufactures the door surround structure. Following up on Mr. Graham's question, what type of receiving inspection is accomplished when the edge frames are received at the supplier?

06:30:05:14 - 06:30:28:18

Unknown

Once they received the spirit, I don't believe any receiving inspection is performed. I believe Mr. Gary Bowen answered that earlier today that week that, or the supplier has a, internal delegation that allows them to perform the inspections on the completed assembly prior to shipping.

06:30:31:03 - 06:30:40:09

Unknown

in the fuselage production documents. Is there any inspection for rivets of the edge frames after

installation?

06:30:40:12 - 06:30:46:09

Unknown

No specific inspections are performed.

06:30:46:12 - 06:31:18:00

Unknown

If, however, there was damage or something noted that did require documentation, then Spirit Manufacturing or QA would request that be documented. Why is it that spirit did not detect the other fastener issue, but yet Boeing detected it on its inbound receiving inspection at Renton.

06:31:18:02 - 06:31:40:16

Unknown

I think throughout the manufacturing process, Mr. Gray Bowen also alluded to this earlier, that if there are items identified that, are suspect and do not turn out to be defective, they would not be documented.

06:31:44:01 - 06:31:54:10

Unknown

When was the last time spirit accomplished an audit of its edge frame supplier?

06:31:54:12 - 06:32:40:07

Unknown

I believe, we have a audit schedule for quick tech. I believe the last audit, the actual onsite audit was in in January. That may have been a, an audit of their, paperwork, though an actual onsite audit took place in, March based on the feedback from the, rivets that were identified. But no defects were noted.

06:32:40:09 - 06:33:20:14

Unknown

But when you said January, do you mean January of 24? Yes, I believe so. You know, when the when it was audited prior to that, I'd have to refer to the documentation. But I can get that information for you. In the January 2024 audit, were there any significant issues found, and if so, can you share them? No significant issues were found and a inspection of the door edge frame, assemblies that were on site in Wichita were also performed and no defects were noted.

06:33:20:16 - 06:33:53:15

Unknown

What actions have spirit undertaken to ensure that defects, such as the discrepant rivets on the edge frame identified, are identified early in the spirit manufacturing process and not transmitted to the Boeing. As was discussed earlier at multiple improvements to the inspection process have been, made by spirit there. It has also been the final product verification performed jointly

with Boeing.

06:33:54:02 - 06:34:15:24

Unknown

prior to shipping to Renton. Mr. Cruz, thank you. Mr. Riney, could you please describe the spirit process when Boeing production request the vendor or supplier assist, starting from the assignment to the final sign off of the work?

06:34:15:27 - 06:35:06:19

Unknown

Prior to the incident or in the 2023 time frame or post? Yes. 22. Yeah. Okay. so prior to the, incident, spirit had contract mechanics and contract inspectors. When, issue was raised, Boeing would notify spirit. There's a packet that we request, prior to beginning the rework. This packet includes normally the the rework materials, as far as the NCR pickup, drawings associated with the defect and any associated parts.

06:35:06:21 - 06:35:38:18

Unknown

At that point, when the package is received, the spirit contract managers will then, identify, individual to begin the rework, once it's accepted and we ensure we have all the appropriate items in the packet, at that point, they assign it to a mechanic. The mechanic will then, go to the airplane in question, and we'll review if they've got access to the area to begin the rework.

06:35:38:21 - 06:36:05:07

Unknown

If there isn't sufficient access, they reach out to, appropriate Boeing individuals to let them know what access is needed and if there's potentially removals required to gain access to that area. it can be at some points, just somebody else performing work in the area. but again, there could also be access, or removals required at that point.

06:36:06:13 - 06:36:44:20

Unknown

but since they cannot begin work right away, they will then go to the spirit contract manager and question on the new assignment. And at that point, if they are able to begin rework, for an example, if there's a missile located bracket, they will get the removal. they'll begin the rework. if a whole check is required or an in process inspection is required, they'll contact at that time the spirit quality to come inspect prior to reassembly.

06:36:45:03 - 06:37:33:02

Unknown

and then we can stamp off in Boeing's, Sema system. what work was performed? And then, the final operation would then be, completed by Boeing quality for the final review of the rework. So after the accident, what changed in that particular process? after the accident, we were

requested to exit the spirit quality team members and, at that point, Boeing quality would then take over all in process and final inspections.

06:37:33:04 - 06:38:00:09

Unknown

In September of 2023. How many spirit employees worked in the Renton facility believe there were four contract managers, 20 contract mechanics and two contract? I'm sorry, what was the last, two contract? QA quality way quality. And what shifts the the spirit employees typically work.

06:38:00:11 - 06:38:30:04

Unknown

It was a 6 to 230 6 a.m. to 2:30 p.m. shift Monday through Friday. but we did on occasion were weekends. that normally gave us a good opportunity to perform any, work. While Boeing employees may not be in the area working. So in Renton, how many spirit employees are direct hires? The spirit in Renton? It's just myself.

06:38:30:11 - 06:38:40:19

Unknown

Just yourself. Correct. And what's the reason spirit chooses to hire contract employees in Renton rather than direct hire?

06:38:40:22 - 06:39:10:16

Unknown

As discussed earlier, today there there's a large availability of skilled mechanics in the, Washington area. this allows spirit to, adjust our workforce levels, based on the requirements of Boeing. whether that be up or down.

06:39:10:18 - 06:40:14:24

Unknown

So how does spirit ensure that contractors used to perform walking tours for spirit is that spirit is responsible for our qualified and trained to be able to accomplish the manufacturing task at Boeing. So I am responsible for all the hiring of the contract mechanics. I personally review all of the resumes submitted by our, contracting house. and I ensure that only those individuals with previous aircraft, specifically sheet metal experience, are part of those that we submit offers to, at that time in 2023, the mechanics would then, come to Renton and we would have spirit trainers in Renton, to perform any required training and any certification requirements, ceiling and ground,

06:40:14:24 - 06:40:44:22

Unknown

as was mentioned earlier, or that type of thing, to ensure that they were qualified. we would then also perform any Boeing sites. We would request Boeing assistance for any site specific

training. they would need tool crib access, for certified tools or, to access the, like, barge, check in checkout process.

06:40:44:24 - 06:41:03:12

Unknown

So there is some type of Boeing training for the contract mechanics, only for the the required training to access the airplane. Okay. Our spirit employee is familiar with the ship side action tracker.

06:41:03:15 - 06:41:24:03

Unknown

They allowed to gain access to that that particular system, that Boeing system we did not have access to ship side action tracker or any, communication regarding, SATs is through email or printed copies.

06:41:24:05 - 06:41:54:11

Unknown

What does the spirit use in Renton to keep track all of the work that Boeing is requesting? There is a Excel or, it's it's a system at Boeing that tracks all of the, spirit coded, items. And then we receive that in an Excel sheet daily. and it's reviewed for any new items that may have added, been added.

06:41:54:13 - 06:42:15:21

Unknown

And at that I review those items. so that I have an understanding of what, is being documented and what we're maybe requested to work. Not we do not always get the request to rework all items.

06:42:15:23 - 06:42:56:19

Unknown

Her spirit personnel are allowed to sign off Boeing production records after Spirit of Work is accomplished. Yes, we do work with the Boeing team to get specific supplier access to seamless. We do. That does not give us access to all options within seamless. only the supplier, version. And what is the supplier version like? And it still allows us to, stamp off on the work, but we cannot put, calls up for notification to QA.

06:42:56:28 - 06:43:08:07

Unknown

if there's a revision needed to in NCR. For that, we must go to, Boeing to help with.

06:43:08:10 - 06:43:50:24

Unknown

Believe you said this, but I will ask it anyway. How is spirit access to the aircraft? And we work

to be performed in Renton. Determined. So that's, normally once the mechanics receive the the work to to be performed, they will go out to the airplane, and physically look in the area and ensure that they can begin that if they cannot begin the work, then it's a matter of going back to the Boeing team and requesting that access, whether that's the LCC, or, Boeing manager that we coordinate with, to help with.

06:43:50:26 - 06:44:20:18

Unknown

And at that time, it's it's purely on Boeing to understand, if they have the individuals available to gain that access and how they will then prioritize when that access was given. The spirit provide any specific training to its personnel regarding gaining access to previously installed assemblies.

06:44:20:21 - 06:44:54:20

Unknown

If you're referring to removals, they understand that they are not allowed to perform any removals of structure that is not installed already by spirit, any Boeing installed installations, they know they can't touch. Even the spirit installed completed items. in some cases we will request removals for just to ensure that we have, all that documentation in place.

06:44:54:22 - 06:45:09:18

Unknown

Was that a recent change or was that that was that same process. That same process has been followed? Yeah, for a while. And when was fuselage 8789 shipped to the Boeing Company?

06:45:09:20 - 06:45:26:16

Unknown

I believe if you've got the timeline to pull up, but believe it was in October. Or excuse me, August. Of 2023.

06:45:26:19 - 06:45:36:29

Unknown

Yeah. August 20th of 2023. The fuselage shipped and it followed that train ride up Wichita to Renton.

06:45:37:01 - 06:46:13:18

Unknown

Mr. Johnson. All right. This series of questions is for Miss Lund. when did Boeing received fuselage? 87, 89. If we could pull up the Boeing timeline, I think that will help as we go through this conversation. We received it on August 31st right. What inspections were accomplished on the fuselage when it arrived at Renton? the inspection that was described earlier, the receiving inspection was conducted during flow day one.

06:46:14:19 - 06:46:38:20

Unknown

if I may just to orient everyone to the chart so it's not confusing. And then I'll reference the chart. When you look at the the chart, the blue timeline, our business days or manufacturing days, the gray dates are weekends or holidays for which work is not necessarily scheduled. In the top line, you'll see the calendar date.

06:46:38:22 - 06:47:10:07

Unknown

Right below that. You will see the flow day as it was proceeding through the production system. So, on September 1st, it was loaded into flow day one per the chart. And that is where we did the inspection. We did the inspection, of the as I described earlier of the previous defects that we had found, a skin quality, a fastener board, etc., and that was conducted on September 1st.

06:47:10:09 - 06:47:38:13

Unknown

Were the five nonconforming rivets discovered on the forward edge of the frame, on the left hand made plug opening? Sorry. I'm sorry. Did you say when? No. How? How? During that inspection. During that inspection, it was noted that those rivets were nonconforming with our requirements or our specification. And, it was written on a non conformance at that point.

06:47:41:16 - 06:48:10:09

Unknown

During the investigation and even earlier in this hearing, we heard the term vendor or supplier assist in production. Could you please provide a brief description of what that process is? Yes, that's the process. When a, we ask a supplier to come and rework, a part or an assembly that they have delivered to us, that is, under their purview in this case, it's spirit.

06:48:10:09 - 06:48:44:25

Unknown

Spirit has a large part of our vendor assist. Another example is we have, seat manufacturers come and work on a seat which is covered under a tire. So that is where we use the kinds of things we use. Vendor assist. In this case, spirit employees are asked to work on spirit to product. that that where we find a defect that is under their statement of work or their responsibility, for clarification for the Boeing process or vendors allowed to disturb previously signed off installations.

06:48:44:28 - 06:49:07:11

Unknown

Not without, contacting Boeing first. and having Boeing provide the the removal or ensuring that the removal or the appropriate paperwork is documented and if a removal is generated, it would be Boeing personnel that would perform that removal. That is correct.

06:49:07:13 - 06:49:15:17

Unknown

Similarly, are vendors allowed to reinstall assemblies themselves?

06:49:15:19 - 06:49:33:24

Unknown

They are not allowed to buy off the permanent work. They're certainly not allowed to reinstall the Boeing statement of work. You take the example of a bracket spirit may reinstall. The bracket would be bought off. If you take an example more like a plug or a, a blanket installation that is removed, the vendor does not reinstall that.

06:49:33:24 - 06:49:41:05

Unknown

Boeing re installs Boeing's work and then buys that off.

06:49:41:07 - 06:50:28:10

Unknown

In the Boeing production process, what determines the need to generate paperwork under BPI 1581? BPI 1581, as was mentioned earlier, is our Boeing Process instruction document for removals. the document requires that any completed work, that had been previously completed or installed on an aircraft when being removed or open to back up needs removal paperwork in the document, as was mentioned earlier, there is a real criteria and explanation for what things need it, but there is a flowchart that talks about when it's needed.

06:50:28:15 - 06:50:40:04

Unknown

And then, as was mentioned, I believe, by Mr. Callen, there is an exception Hendrix in the back for things that do not need removal.

06:50:42:14 - 06:51:16:16

Unknown

Scuse me. I know we mentioned earlier that today, all production personnel who want to write removals have to have training. Is that training recurrent? We have recurrent VPI 1581 current, training today? Yes. Okay. The production process. What what is the function of the door team at the Renton factory? Or our door mechanics or a specialized group of employees?

06:51:17:06 - 06:51:44:14

Unknown

we we often give employees a specific job skill code if they provide a specific function. A door mechanic is one of those. That's a specific, skill. And function. And the door crew, and the door teams fundamentally do all of the aspects associated with our doors. They rig our passenger doors and they do our rig checks, or this mid exit plug, or for other doors.

06:51:44:20 - 06:52:10:18

Unknown

They do work associated with the doors. It's a specialty skill to any other teams in the production system. Work on doors or door plugs besides the door team. there are two door teams. There's one who works at the back of the factory, one who works at the front of the factory. The door mechanics and the door teams are the only ones who work on the doors.

06:52:10:21 - 06:52:36:28

Unknown

Are there are there special qualifications or training needed to be part of a door team? Either one the beginning or the end? yes. And the training for those door mechanics, is provided as described earlier with the foundational training. And then on the job training as well. And that was true back in September of 23. Yes.

06:52:39:14 - 06:52:47:26

Unknown

how many door team members were working in Renton in September of 2023?

06:52:47:29 - 06:53:21:14

Unknown

I apologize, I do not have that exact number with me. You know how many managers there were for the door team? In 2023? I believe one, typically 1 or 2. I believe one. What shifts do the personnel that work on door teams typically work? They typically are a first shift operation in Renton and what happens if you have a second shift need for door work?

06:53:22:00 - 06:53:39:21

Unknown

if we have a second shift need and we know it, we will sometimes ask one of our trained mechanics if they can stay over and complete it for us. On second, or work with an on second. if we do not have skilled labor, the job will be held until the next day.

06:53:39:24 - 06:54:02:00

Unknown

And the previous panel, you described the ship side action tracker process, as that record was created by Boeing personnel to track a non conformance record cited by the Boeing quality in the early stages of productions on on line 8789. Can you please describe in detail the issues that led to the need to open the med plug for rework?

06:54:02:03 - 06:54:12:25

Unknown

Yes. If I could go back to the timeline, I think that is a helpful exhibit. To answer this question.

06:54:12:27 - 06:54:40:18

Unknown

Right. I might look up here. It's easier for me to read it. So, let me know if I am not near enough to the mic. the five discrepant rivets were identified on September 1st and the non conformance was written. the holiday weekend came for which three days passed. during the following week spirit came.

06:54:40:18 - 06:55:07:00

Unknown

Is this what you would like me to walk through this process that happened? Thank you. Yes. Spirit, initially conducted the rework on September 6th, the Wednesday of the following week. They applied the stamp and same as after that, the Boeing inspector, as I mentioned, who came back after the spirit completed their job, came back and found the work to be unacceptable.

06:55:07:02 - 06:55:43:03

Unknown

The Boeing inspector removed the spirit stamp, which is what happened at the end of September 6th. You will see they removed it and they requested again that spirit come and appropriately completely rework the rivets. 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.

06:55:43:06 - 06:56:06:21

Unknown

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.

06:56:07:07 - 06:56:39:29

Unknown

as we continue through the process, a few notable events. On September 14th, you will see it was elevated to a tier two in our fat tracker there. The tier level process is a process we use to elevate issues on the factory floor. They get higher level management attention to when it gets elevated from a tier two. It goes from just, a local team level issue, trying to work it to a level of management so that management can help reprioritize, provide assistance to the floor.

06:56:39:29 - 06:57:22:05

Unknown

So it was elevated to tier two, which is a senior level of manager within the factory shop. On September 14th. that is when the conversation began about what is required for spirit to gain access to do a full removal and replacement of the rivets. you can see that on September 15th, in the communication tool, the ship side action tracker, it was decided that, we would need to remove the plug in order to have access to those, pull access to remove the rivets and, and reinstall them.

06:57:23:11 - 06:57:55:04

Unknown

by September 17th, the work was still not complete. So the team elevated it to a tier three. That's an executive level in the factory asking for help to get this work completed, because it needs to get done. as you can see, sometime on September 18th, the plug was removed. And we know that because spirit began their rework on September 18th to remove and reinstall the rivets.

06:57:56:14 - 06:58:24:00

Unknown

that lasted one extra day. It's a spirit. Needed additional rivets. They had drilled them out. They needed new rivets to finish the job. They didn't have the ones they needed that day. So we went and, had those rivets brought down from our Everett location. Those were available to them on September 19th. So they reinstalled replace the discrepant rivets on September 19th.

06:58:24:02 - 06:58:34:05

Unknown

And that is when, the rivet job with new rivets was bought off by both Spirit and Boeing.

06:58:34:07 - 06:58:55:12

Unknown

I want to clarify one thing the slide says removed, but it was actually opened, not removed. Is that a true statement? yes. So in this case, in I think we use both words. The the main exit door plug has fittings showing that, fittings on the bottom of the plug. what we typically do is open it.

06:58:55:14 - 06:59:23:03

Unknown

So with the fittings attached the door rotates open. and that is what happened. Thank you. Was the med plug the pacing item for 87, 89. Sorry. Can I can we just have it. Just quick clarification. Do you mean opened the 15 degrees or fully opened? In this case, it was fully opened so that it could lay flat virtually flat.

06:59:23:05 - 06:59:45:07

Unknown

Was the med plug the left hand med plug, the pacing item for 87, 89? There were other statements of work still open at the end of the line. specifically, one of our more critical statements of work that was still open was a wire bundle that needed to be removed and replaced. that was a critical item leading at the end of the line.

06:59:45:09 - 07:00:02:07

Unknown

And that job was complete on September 18th. So at the end of the day, spirit I believe was

haven't checked exactly. Probably the last job that was complete prior to the airplane rolling out.

07:00:02:10 - 07:00:23:22

Unknown

He's on the SAT record showing personnel had confusion on whether the med was a door or a plug, and whether or not a removal needed to be generate to document the opening of the door or plug.

07:00:23:24 - 07:00:49:18

Unknown

Why? Why was there a confusion around this? I guess is what I'd like to understand. as as I reviewed the, the transcripts and of course, not being a part of it or knowing 100%, but as of I reviewed the set records and the corresponding, it seemed to me that the team what happens is we often say to a door mechanic, we need someone to come down here and provide access.

07:00:49:20 - 07:01:11:13

Unknown

We have multiple, airplanes in our system at any time with different configurations. I read this as just a conversation around what is the configuration of this airplane? Is it a door or is this a plug? to add just a little bit more information to my testimony on the first panel, there are doors and there are plugs.

07:01:11:13 - 07:01:35:18

Unknown

There is also a deactivated door, which is a sub kind of a door. It's still the door. Some doors actually open and close. Some are a door that are deactivated. So I read this as simply, the the employees asking which configuration is this airplane that we need access to? Is this a plug or is this a door?

07:01:35:21 - 07:01:56:08

Unknown

Meaning to me, they had not been to the airplane yet to go look at it. They were preparing. They were getting the employees there. It becomes obvious when you go to the airplane to look. Are there production personnel at Renton trained on the differences between models or sub models? I guess was what we called them earlier. so that they would know the difference between a plug in a door.

07:01:56:11 - 07:01:59:24

Unknown

Yes.

07:01:59:26 - 07:02:15:29

Unknown

Knowing that Boeing has a comprehensive manufacturing process where there are other opportunities, where the rivets were after the rivets were replaced, where they missing vertical bolts could have been caught.

07:02:16:01 - 07:02:40:12

Unknown

There are other opportunities where they could have been caught. But but they were not the primary path would have been the open paperwork, which we have said we don't believe existed. It's not in us. And to clarify, to date, we have still found no paperwork documenting the opening or sorry, the removal of 8780 nines left hand made look.

07:02:40:15 - 07:02:48:22

Unknown

That is correct, Mr. Cruise.

07:02:48:25 - 07:02:59:15

Unknown

Mr. Riney, during the investigation, the team heard the term ship short. What is ship short?

07:02:59:17 - 07:03:34:09

Unknown

So the term ship short, refers to if there is a part that is not installed on the fuselage or spirit provided the item prior to shipping to Renton, it follows an established process. the Boeing team must agree that they or what they are willing to accept that end item, into their production. with that part missing, with the understanding that it will be they will be provided at a later date.

07:03:34:12 - 07:03:58:24

Unknown

At that time, Boeing would then create an out of sequence IP to establish planning in their, QMS for the installation of that port that was shipped, short from Wichita.

07:03:58:27 - 07:04:10:29

Unknown

If there were any items shipped shorted on fuselage, any 8789 when it left Wichita, not to my knowledge.

07:04:11:02 - 07:04:50:09

Unknown

From your perspective, what was there anything unique about the repair on the five rivets of the forge airframe and left him the exit door on 8789? Probably the only unique thing was that the timeline of the identification of the rivets to the point of when they were actually removed and replaced. Outside of that, it it's not a non standard repair to remove and replace rivets.

07:04:50:12 - 07:05:04:15

Unknown

Based on that, the timeline that Boeing provided was there a spirit and Boeing Mr. Misunderstanding in the work that was needed to be done?

07:05:04:17 - 07:05:20:02

Unknown

I believe from the initial documentation, the spirit contractor incorrectly stamped what work was performed.

07:05:20:04 - 07:05:52:08

Unknown

In follow up conversations with that individual, he stated that he had confused that airplane with another airplane that he was working on that day. he had stated that he had removed and replace them, when in actuality he did not, because he believed that, the rivets met the, back 5000 4-1 specification when that was identified by the Boeing Quality individual.

07:05:52:10 - 07:06:30:06

Unknown

They I had written a, 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 believe that the rivets met the back 5000 4001 specification. in the Boeing timeline, this is also shown, and that's where the, disagreement with the Boeing QA, was identified.

07:06:30:06 - 07:07:03:05

Unknown

And then they in turn, rejected Spirit's statement and requested the rivets be removed and replaced. At that time, that's when the, team identified two Boeing that to access those rivets, the plug would need to be opened. At the current configuration, there was only access to the tail side. the head of the rivet would be in the seal retainer on the image.

07:07:03:08 - 07:07:38:07

Unknown

On the door frame. Yeah. And that's where we would need access to drill out the fastener. And for the record, that's bare personnel open and close the left hand mid exit door plug prior to and after accomplishing the rivet replacement. No, none of the spirit contractors have any training in how to perform that work. And we request that, if they are not trained, that they did not perform any, work.

07:07:39:22 - 07:08:04:08

Unknown

and at that point, we, we have always taken the position to request Boeing assistance for

opening of doors for access. And for please bring up, exit 11, exhibit 11, attachment for page three, please.

07:08:04:10 - 07:08:36:04

Unknown

So during the, this is for Miss Lund. during the investigation, Boeing provided a list of 62 other cases since 2019 where there were there was a removal documentation created for the mid exit door plug while the airplane was in production or on the flight line. What is the difference, if any, between these 62 cases versus the lack of documentation on 8789?

07:08:36:07 - 07:08:57:18

Unknown

Other than the lack of documentation, I'm not aware of what the difference is. per the BPI that we've been referencing, removal should have been written per process for the removal of the MD plug. These are examples where it needed to be open. Perhaps the difference is the reason it needed to be open, but nonetheless it needed to be open.

07:08:57:20 - 07:09:04:01

Unknown

And in these cases, a removal was written.

07:09:04:04 - 07:09:32:09

Unknown

Based on the previous answers to questions on who is allowed to work on the exit door plugs the door. Crew members working only on the day shift and knowing no no. DAW crew member worked on the second shift on September 19th. What Boeing production plan or process was in place? Should a door crew member be needed to complete a plug or door related work on an off shift?

07:09:32:12 - 07:10:05:23

Unknown

Plan would have been to have a door member stay over. As I mentioned, that was not done, so the door would have need to to been officially closed by a door member, which would have been the next day. This is a point to open up into what we, we believe happened to that evening. and that is when an airplane prepares to roll out of our factory, a, we call them the Move crew.

07:10:05:23 - 07:11:07:04

Unknown

I believe their team name is the aviators, but we call them the Move Crew comes in and prepares an aircraft to move outside. Their fundamental job is to prepare it for the elements, to close the doors, to close the engine. Cowls, protect it. If there's an open space on the airplane, protect it from the elements. and in this case, the move crew says that they believe that they pushed the door to not intending to firmly reinstall it, but simply to prepare the airplane to be

ready to move outside.

07:11:07:06 - 07:11:14:15

Unknown

To Johnson.

07:11:18:09 - 07:11:45:06

Unknown

Security. After assessing the issues related to this event on 8789, were there any changes instituted in the spirit supplier as this, process for spirit personnel to prevent this type of thing from occurring in the future?

07:11:45:08 - 07:12:17:29

Unknown

For for our team. Again, as was mentioned earlier, there were specific changes that that that Boeing it instituted. they've removed the spirit quality team members, contractors. There was also, as miss mentioned earlier, an assessment performed of the spirit on site contract mechanics. That assessment.

07:12:18:01 - 07:13:06:04

Unknown

Took place, in January. And at that point the individuals that passed the assessment were returned to the shop for, there's been an increased level of engagement with the Boeing operations team, specifically with a, operations leader working closely with our team, along with their Boeing operations counterparts, to ensure that the work gets accomplished as early in the process as possible.

07:13:06:07 - 07:13:40:23

Unknown

Thank you, Miss Lund. What safety actions has Boeing instituted to ensure the unauthorized removals do not occur in the future? We, shortly after the accident, put out the documentation virtually immediately. That was the read and sign, ensuring that every employee, had access to these removals and then signed that they understood the removal process. So that action was taken shortly after the accident.

07:13:40:25 - 07:14:21:12

Unknown

We then, revised the process, as was discussed briefly in the previous panel, where we have, initially made it a team lead and then trained employees to initiate the removal. We also added back end the okay to remove quality inspection upfront as we look through the removals, who help us through this process as well as it comes to the mid exit door, we have implemented, several changes, but the most visible is the day the fuselage arrives in our factory.

07:14:21:14 - 07:14:51:18

Unknown

We have a laminated blue and yellow tag that we hang on the mid exit door, plug in in relatively large font. It says do not open and in smaller font it says without contacting quality Assurance, that tag goes on the med plug the day it arrives, and it stays on until the end of the process. When we are putting the airplane up for its final customer inspection, it it comes off for the flight and gets reinstalled, but fundamentally it stays there through our entire production process.

07:14:51:20 - 07:15:20:21

Unknown

And so we've added that visual for the med plugs. So there can be no question, that, that it needs a removal. And what is to happen prior to removing it. we've strengthened the removal process, we've improved our training for the removal process. And we are, continuing to work through the actions of that SRM on the removal process that we mentioned earlier.

07:15:20:23 - 07:15:51:02

Unknown

May 1st follow up from before. we when we talked about when I asked you about the slide being removed versus open. Yeah. So the left hand med plug remains remained hinged at the bottom, was disengaged from the tracks, was the lanyards were unclipped and the door was laid open on to a stand at approximately 90 degrees, but remained hinged at the bottom attached to the aircraft.

07:15:51:04 - 07:15:58:06

Unknown

That. Correct? That's correct. All right.

07:15:58:08 - 07:16:35:18

Unknown

What actions have been taken to ensure that removals are written to the highest possible standard? I know you kind of answered that, but I really want to punch this home because I think it's important. All right. Thanks. that is why we've required people to pass this training prior to being able to write the removal. one of the, items that the NTSB has noted and we noted as well, is that in looking at the consistency of our written removals, they are not at the level of consistent that that we would like that when they're there.

07:16:36:04 - 07:17:00:14

Unknown

there's there's not the level of proficiency and consistency in writing it. So that's why we've improved the training. And then we did that. That's why we put the assessment process in there to make sure that before someone can write a removal, they can pass an assessment about what should be in a removal, what's the right process, what's it mean that there's a level of proficiency and and that as well as the quality, okay.

07:17:00:14 - 07:17:24:17

Unknown

To remove the quality inspector. Now also we'll look at that paperwork and make sure that it's right and we're good to go before we start removing things from the airplane. So those are the primary two steps to address that very issue. Thank you. That concludes the questions from the technical panel. Mr. Breezy, back to you. Madam chair, great.

07:17:24:17 - 07:17:49:14

Unknown

Thank you. We're going to start with questions, from the parties and same, process and we will start with Alpa. Thank you, Madam Chair. our question is of Boeing. How many of the max post accidents med plug inspections revealed problems with the original med installation.

07:17:50:13 - 07:18:06:01

Unknown

I don't have that data on me that started with the original med plug installation. I don't know that answer.

07:18:06:03 - 07:18:40:08

Unknown

Okay, have any of your customers reported 737 900 Air Med Plug installation faults during heavy inspections? If it's the same door as previously testified. not that I am aware of. I do know that when we went out and did the inspections after the accident, we included the 900 year in those inspections, and we found some of the similar issues on the 900 air that we had on the max.

07:18:40:10 - 07:18:49:07

Unknown

But that is not the same as a heavy inspection. To your exact question.

07:18:49:09 - 07:19:15:26

Unknown

Where of a multiple med plug installation irregularities discovered during the post accident? Max grounding inspections, as you previously pointed out, including the right hand med plug of the accident aircraft. We'd like to know what Boeing is doing to ensure that they and their suppliers are providing a defect free aircraft to the traveling public. Thank you. as a result of our findings, that is that is why we've taken many of the steps that we have taken.

07:19:15:28 - 07:19:48:09

Unknown

So first, earlier in panel one, both Doug, my colleague from Boeing and Spirit discussed the enhanced inspections at spirit involving the plug. the oversight of the inspections, the the, end of

line inspections. And then when it comes to Boeing, we are doing additional inspections of those mid exit plugs as well. at the end of line, we operate what we called the mom.

07:19:48:09 - 07:20:13:12

Unknown

My mom stands for a multi operator message. This mom was put out after the accident for the fleet. All go re inspect their door, open it, make sure it's all good. Everything's good. We do that on every aircraft now at at the end of our production system. So we still implement that final inspection to ensure that the, mid exit door plug is good.

07:20:13:15 - 07:20:36:00

Unknown

In terms of the other findings and discrepancies that were found, those are the ones that we have worked back one by one. This is why we've implemented our in-process inspections. We've implemented, all of these potential issues that we saw, the real issues we saw on the fleet that happen again. And those are in our end of line inspections that we now check for at spirit as well.

07:20:36:07 - 07:20:47:12

Unknown

We've worked them back. We've added inspections at spirit, trying to come to ensure that we don't find any of those same issues again.

07:20:47:14 - 07:21:22:25

Unknown

Q my next question is for, spirit on the NTSB manufacturing records report, there were 26 spirit AeroSystems personnel employed at the Boeing Assembly facility, including two quality assurance personnel that did not recognize the fault with the rivets on the first non conformance record, the rivets were painted over and not repaired, resulting in a second non conformance record where none of these employees at Boeing trained to inspect rivets, identified damaged rivets and repair these rivets properly.

07:21:22:27 - 07:22:06:11

Unknown

Yes, as I previously mentioned, the spirit mechanic made an, contractor mechanic made an error in the statement that he had applied to the initial inspection. or excuse me, the initial documentation. The spirit quality assurance contractor, they will normally work right alongside the mechanics, but I believe that that error transferred over into the application of the stamp on the inspector's part as well.

07:22:06:13 - 07:22:35:03

Unknown

The reviewing, the. I think if you if you wanted to pull up one of the images, I think it's 11 C page

13, that does show one of the the rivets painted. based on the discussion with the mechanics, I believe they felt the rivets were acceptable. that may have required removal of paint, initially, or the secondary primer application.

07:22:35:21 - 07:23:01:25

Unknown

and then to reapply paint. And then that's why they then stated on the Boeing, unauthorized rework pickup that they believe that the, the rivets met the requirements. I think that's image three. I think I was referring to image four, but yeah, so that that that's why that based on that image. That's why I believe that they, they felt to the rivets.

07:23:01:27 - 07:23:36:12

Unknown

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. And why they then applied that information on the unauthorized rework. pickup. But they are the training for the inspectors. that is completed by the spirit Wichita trainer would also go over these types of, inspection.

07:23:37:00 - 07:23:44:23

Unknown

the back 5004 dash, one dash to, you know, for fastener installation.

07:23:44:25 - 07:24:06:22

Unknown

I don't question are the mechanics and the inspector not independent? How do you mean? Are they the same toy lines? Same. you know, they they both approve the same piece of work and they independent. Do they walk from a different, department group? Are they sitting next to each other? They are in the same the same item.

07:24:06:25 - 07:24:45:09

Unknown

They they. Have a separate area within the Boeing factory, that they work out of. but the spirit contract mechanic is only able to stamp off on the contract or the excuse me, the mechanic operations and the spirit QA is or at the time was only able to stamp off on the QA operations and it identified there's stamps independently within the the Boeing CMA system.

07:24:45:11 - 07:25:14:06

Unknown

Thank you. No further questions. Thank you. We will now go to Alaska Airlines. Thank you for your and do, a couple of questions for clarity. We talked about the initial rig period and not necessarily having training. but looking at fit and flush. And now we're in the Boeing factory. We talked about the final fit. So, Miss Lund, what flow day is that?

07:25:14:06 - 07:25:42:19

Unknown

Final fit done by. And who is it? Dunbar. For two final. There are two times we check it in our factory. The final one is obviously the latter, but there are some things we check for the final time earlier in the day, 1 or 2 we do the rig check of the fuselage. We check it on the outside of the fuselage and the inside of the fuselage.

07:25:42:21 - 07:26:07:20

Unknown

That is done by our door crew. The airplane then proceeds down the line and becomes an airplane. It gets the weight on wheels. As Mr. Riney referenced. It slows down the process and on slow day nine, the next to the last day in our factory, we do the final fit and fair. And that is an external only check to our final internal rig.

07:26:07:20 - 07:26:31:13

Unknown

Check for gaps etc. is done in the structures tool up front. The final fit and fair check on the exterior that we check after the weight on wheels is done in day nine, both by our door experts. Thank you sir and both of those are also pressure checks right? The the pressure check is actually done on flow day seven.

07:26:31:15 - 07:26:52:26

Unknown

I believe pressure testing that is where we pressurize the aircraft. We want to do that final check after the pressure testing to make sure that it's not moved. And when it's seated or pressurized to our final, our pressure check of the aircraft is done on flow. Day seven prior to our final external check on Flow Day nine. I appreciate that.

07:26:52:26 - 07:27:19:17

Unknown

That's good information on Flow day nine. As we do this check and we find some additional rigging that needs to happen, is that going to be my door crew or is that another workforce? Your door experts again, your door crew? Okay. Thank. Mr. Riney, you talked about Puget Sound area having some great technical experts to bring in as contractors.

07:27:20:11 - 07:28:00:20

Unknown

I agree with that. A great place to be. or at most of these previous Boeing employees. It can be, or they can also, I think this is what we've seen after Covid, there's been an increased number of, weather retirees from Boeing or even retirees from spirit that have gone to contracting. And so that's where we can then pull from for immediate, highly skilled individuals, to, to get into our workforce in Renton quickly.

07:28:00:22 - 07:28:31:16

Unknown

I think that's great to use that resource. Is your training, solid enough to let them know that the role has changed and their, the tribal knowledge, as you might say, of process, has changed as a contract or spirit. So I, I don't believe that we deal with tribal knowledge in our specific situation in Renton because it is strictly focused around rework.

07:28:31:16 - 07:39:15:08

Unknown

So. With the, you know, the majority of our, our team specializing in fastener removal and replacement, or some small structure replacement or tool mark blends, that type of thing. It's it it's not something that, I believe lends itself to tribal knowledge, but more hands on experience. Okay. Thank you. Appreciate that. No further questions. Thank you. We're going to take a ten minute break and come back and, start with the Association of Flight Attendants.

07:39:15:10 - 07:43:48:23

Unknown

So.

07:43:48:26 - 07:43:56:10

Unknown

Oh. How you doing, Wilbur?

07:43:57:13 - 07:44:11:17

Unknown

Copilot. Tell him her, scuba and, James Ford to.

07:44:11:20 - 07:44:26:19

Unknown

And your glove. Yeah. Oh, my gosh. Have.

07:44:26:21 - 07:44:51:08

Unknown

We don't know. Just soon. confirming. The, statement. image. Print off. oh. Spores.

07:44:51:10 - 07:45:01:18

Unknown

0100. I shall live from the mark for the.

07:45:03:28 - 07:45:09:27

Unknown

one, ones who?

07:45:09:29 - 07:45:17:20

Unknown

On my, law.

07:45:19:28 - 07:45:44:27

Unknown

on left hand med plug off of the stand in the. I'll call it almost closed position, but, and I came to the same conclusion you did initially. And then when we went through with the timing, it actually turns out it was on the night of the 18th and not on the night of the 19th. so.

07:45:45:00 - 07:46:09:09

Unknown

The transcript does talk about him saying that he pulled it almost closed. and that that is part of the docket and that is available. but it happened on the 18th and not the 19th, and we have no knowledge. And I hope if you have knowledge, please share it. We have no knowledge of who closed the plug on the 19th.

07:46:09:11 - 07:46:42:18

Unknown

And, I want to understand if you know something that I don't I do not have any knowledge beyond what you described. I will certainly go back and review those exact dates, but I don't have knowledge beyond what the, interviews that you just described as well. Okay. Thank you, thank you. I think the the transcripts show that it was reopened, that it that at some point it was closed but not totally closed on the 18th and would have been reopened, reopened on the 19th to complete the rivet rework.

07:46:42:18 - 07:47:03:00

Unknown

Right. That is correct. And on the 19th the rivet rework was done and completed by roughly 630 in the evening. Correct. and all of that happened well after the weight was put back on wheels and the had to be reopened in order to do that. So thank you. Correct. I agree with my reading of that as well.

07:47:03:00 - 07:47:12:12

Unknown

Yes. Great. Thank you. Thank you very much. RFA Mr. Hypo.

07:47:12:14 - 07:47:46:07

Unknown

Just a clarification on the inspection of the door bolts. not necessarily specific to this aircraft, but after the aircraft is delivered by Spirit to Boeing, are the bolts inspected prior to them being covered? There's no rework done. Or is it pre pre accident in September they would have been

reviewed and inspected in two portions. Number one is the rigging area where they're, they are looking exactly at that part of the plug.

07:47:46:14 - 07:48:06:22

Unknown

I believe it would be noticed during that rigging if something was not right with the door on the inside. The second portion during that same time, as described very nicely by Mr. Catlin earlier, when we call it okay to close, there is an okay to close effort. Also done upon a removal of the airplane. That's how it was done then.

07:48:06:25 - 07:48:36:25

Unknown

Now we have a specific review for the bolts themselves and the plug. Thank you for that review. and if you can entertain just a another question about lubricant, is Boeing provide guidance to operators and contract maintenance for what lubricant to use when closing the door lug after maintenance for the Max nine and the 737 900 E are.

07:48:36:27 - 07:48:47:19

Unknown

If not checked the maintenance document for that specifically, and so I cannot answer that specific question.

07:48:47:21 - 07:49:21:16

Unknown

Okay. And then to both of you, there seem to be, a bit of a discrepancy about the labor market in northwest, Washington. Boeing described, a dearth of qualified candidates and Barrett, describes a surplus. is that just a different in qualifications that you're looking for or can you help us understand? The four spirit, what I described was after Covid, there was an increase in the availability of contractors.

07:49:22:20 - 07:49:57:29

Unknown

it appeared that either retirees from, Boeing or MRAs or or that that type of thing in the area would allow us to quickly pull those types of resources. I'm, I can't speak to those seeking full time employment direct to Boeing, though, which is what all of our jobs are. They are, full time. but I am represented hourly employees in the Puget Sound.

07:49:58:05 - 07:50:09:08

Unknown

And so it would eventually, I don't know, but potentially not necessarily be the exact same people who want to come work permanently versus a contract.

07:50:09:10 - 07:50:17:07

Unknown

Thank you. No more questions. Thank you very much, Mr. Gerlach.

07:50:17:10 - 07:50:41:14

Unknown

Thank you. Chair. two questions. the first one, when the FAA issued the airworthiness directive that referenced the mom, did, did you all go back and perform that ad on the production airplanes? in the factory? Yes, we did. And then the next question that I have for you, there was a Boeing employee, a team lead door, team lead.

07:50:41:16 - 07:51:08:07

Unknown

He stated that we do not open and close these door plug. It's not something that we do. Did you mean they that there's a different door team that does that and not not this particular one. It's in the transcripts. one of the interviews, I, I would need to go back and reference exactly what he says. it is not their baseline statement of work to open and close it.

07:51:08:07 - 07:51:36:05

Unknown

That is a true statement for sure. As we've mentioned, if the rig is correct and it holds, nothing happens through transportation or the build of the aircraft. On most airplanes. And you've seen this as well. The the plug does not need to be opened. but there are occasions where it needs to be open and I believe that the door crew is responsible for opening the plug in the case that needs to be opened, not based plane work, but when it needs to be open.

07:51:36:08 - 07:52:08:27

Unknown

And then his transcripts. in the interview, it says that he referenced AOG and SST as being responsible for opening and closing the door plug. Our AOG and SST team mechanics are, it's a group of highly trained mechanics. Our AOG team, obviously, is the team we send out on the road when an aircraft is AOG, or when we need a highly skilled group of employees that can do multi-skilled, work function out on the road, including some of the door crews.

07:52:09:00 - 07:52:37:06

Unknown

SST is a similar group to that, maybe not quite as highly skilled as broadly as AOG, but very highly skilled. We pull them from experienced mechanics. and so we, with the right training, can use AOG and SST to do those skills as well. We pull SST energy in to do what I'll call non baseline work, frequently in order to allow our actual employees to stay on the job.

07:52:37:08 - 07:53:02:00

Unknown

So I do know that we use AOG and SST. As you can imagine, AOG is not always available.

Sometimes they are SST is usually more available sometimes, but depending on their workload as well. But but I do believe those those employees are capable of doing it right. So in all likelihood they would have been the appropriate organization to go to to have it open and close.

07:53:02:03 - 07:53:32:19

Unknown

We could have called them appropriately. Yes. thank you very much, chair. That's all the questions I have. Thank you very much, machinists. Okay, madam chair, this question is for Miss Lund. So we do see through the SAT data that there was confusion about the removal process. on line 87, 89. But, my question is about the okay to install the blankets.

07:53:32:21 - 07:54:05:21

Unknown

Is it clear to Boeing that the okay to install the blankets that was complete and then had to be open would have required a removal as well? Verification on my review of the data. my review of the data showed that when we did the okay to install the blankets, that it was complete less stamped by the mechanic in the inspector complete less the area around the plug where the NCR was.

07:54:05:23 - 07:54:29:12

Unknown

So it was not stamped off complete. It was complete less that area, which is a process, as you know, John, that we were allowed to do so that the rest of the work in the area can continue, but the final stamp doesn't get applied until that final work gets done. And I believe that in the case of this airplane, it was complete less by manufacturing and quality in that area.

07:54:29:14 - 07:54:52:09

Unknown

Her evaluation showed that the blanket install was stamped complete on 91, even though the fasteners had to continue to be worked. and maybe that needs to be looked at. I think it does. Just as a point of reference, when we went out at lunch, I heard this conversation. I had the team go look again. We believe it's complete less.

07:54:52:09 - 07:54:59:09

Unknown

We should go look at that and get clear on that. Okay.

07:54:59:12 - 07:55:20:23

Unknown

And earlier there was discussion around some removal or opening of the medi plug. is that terminology? Is that do you believe that terminology to open or to remove that? You said it was interchangeable.

07:55:20:25 - 07:56:12:09

Unknown

I have heard both. I have heard both. I believe we have heard removal because there are parts that are needed or a removal is needed. The opening, because the bottom can still be there. There's clearly the option to actually remove the entire, plug itself. That was not done. I have heard people use both. I've heard you mention you are company is working on, you know, training and other corrective actions to solve these issues in the future because there was SAT traffic with management, other salaried folks in the LCC on whether a removal was required, some of that corrective action or, training also being provided for management.

07:56:12:11 - 07:56:49:02

Unknown

Yes. Can you elaborate on that? we have as a part of our, improvement activities, there is a, training for our first level managers, first, second and third level managers, both. And a portion of that is leadership training that we're doing a great deal on it. And a part of that is technical training, including the technical aspects of our policies and procedures to, reinforce and train on those very issues as well.

07:56:49:05 - 07:57:34:29

Unknown

Thank you. this question is for Mr. Rainey. when you were speaking about receiving products supplied by a supplier with delegated inspection, what is the inspection process that you use? that spirit uses to receive parts or assemblies from a supplier with source delegated inspection? Yes. So normally that will entail, as part of the receivable process, inspection of the paperwork to ensure that the parts shipped, align with the, parts being delivered, along with a visual inspection to ensure no damage occurred during shipping.

07:57:35:02 - 07:58:06:21

Unknown

But that's the extent of the inspection. There's. We don't conform the incoming product. Okay. I would ask Miss Lund the same on parts or assemblies that are brought in from the supply chain, from a supplier with source delegated inspection authority. what kind of inspections are in place for receiving and what process? Do you know? What process is used to complete that inspection?

07:58:07:05 - 07:58:35:05

Unknown

if it is sourced, delegated, with no probation or any other kinds of, corrective actions coming from the Boeing Company? my expectation would be that the, inspection is done at the supplier, and then we will do, an initial receiving inspection when it arrives at Boeing, be it certainly an ID and damage and, an initial visual inspection of parts when they arrive.

07:58:35:07 - 07:59:01:08

Unknown

And then, of course, there's the oversight process we talked about earlier with, things evaluated as possible. That, of course, does not necessarily apply to a spirit, as we've discussed earlier with that is just such a large supplier. It's a little bit different. And is it different because spirit, had many defects that you were aware of and trying to work to track down.

07:59:03:06 - 07:59:36:03

Unknown

yes. And we had been working at as was discussed earlier with spirit, we had increased our presence and we had increased our oversight. So yes, due to that, certainly since the accident. But and it's always been a little different with spirit. They obviously provide. They are our largest supplier by far. They provide the entire fuselage. The amount of work that's done is very large, and we have always had, some permanent onsite presence at spirit, which we do not everywhere.

07:59:36:06 - 08:00:11:18

Unknown

Thank you. No further questions. Thank you. Miss Meyer with spirit AeroSystems. So, this question is for Mr. Rainey. So is there are there cases, Mr. Rainey, where Spirit and Boeing disagree on what a defect is? Yes. I don't believe that's uncommon. there are certainly some of the defect right ups that we see. They may not be completely clear, may not have all the details, of the specification.

08:00:11:18 - 08:00:36:08

Unknown

And after, investigation by our team, determine that the items do meet the specification, and then we are able to show where in the spec that they would meet that. And if it does go both ways, those there are some items that we agree on. and then there are some items that we just don't, don't end up agreeing on.

08:00:36:10 - 08:01:15:14

Unknown

So can you give me some examples of those type of items where we might not agree on what a defect is? one specific one. You know, like we showed in the photo. You know, it could be actually a cosmetic defect. That's not, fit form and function wise, it doesn't actually detract from the installation. And if there's not specific measurements included in the write up, that type of information could be the, whether the defect is a true defect or not.

08:01:15:17 - 08:01:45:24

Unknown

So in running the the if there's a disagreement that we can't meet resolution, who's the final decision maker in the Boeing quality system? as you mentioned, because it is Boeing's QMS, they have final say on whether the item gets worked or not. Okay. Thank you all for now. Thank

you. Captain Jen Gillis. Thank you, Madam Chair. this question is for Miss Lund.

08:01:45:27 - 08:02:19:21

Unknown

During the investigation, it was discussed how common the removal of the plug is, how often our mid exit door plugs removed from an aircraft. In in the production system? Yes. There are 62 times were the number of times that we found. It is not what I would call normal. that is not a large number of instances. and so only when there is a, a reason that is out of the normal, most airplanes will not have that mid exit door opened.

08:02:19:24 - 08:02:44:07

Unknown

And then in maintenance, it's opened as a after a number of years to check the structure under a major structural check. But not, frequently there either. And thank you. When when reinstalling the mid exit door, can you reinstall the old and removed hardware or is it a new set of unused parts and are those required in terms of the bolts themselves?

08:02:46:01 - 08:03:19:24

Unknown

we've had this discussion. In order to reinstall the previous bolts, they would need to be, conforming with no issues, no defects, no signs of wear of the previous installation. when we were doing our mom in production and continue to we have been using new hardware. We had the conversation if previous existing hardware could be used, and the answer that I received is if it was fully conforming with no defects in exactly the right part, it could have been reused, but we were installing new parts.

08:03:19:24 - 08:03:24:03

Unknown

In that case.

08:03:24:05 - 08:03:46:01

Unknown

The different on the assembly line versus on the ramp, and what verification process our mechanics using to keep track of removed parts and ensure that all parts get reinstalled. Our processes are the same in the manufacturing system and on the ramp. The the primary difference would be on the the ramp. Typically more parts are installed and you may have to remove more parts.

08:03:46:01 - 08:04:13:09

Unknown

Obviously in the build maybe something's not covered up. It hasn't already been built out on the ramp. If you need to access something removals may be more frequent. the process is the same. The BPI is the same. The process is the same. When parts are removed, they should be

removed. There should be, paperwork with them and placed on a work in process ramp rack, which is where they are housed.

08:04:14:17 - 08:04:54:18

Unknown

in again, I will, talk about the way it was in September of 2023. The parts were, labeled to go on the rack. There was a, required tag that has to go on it that has the part number, and the IP number are in the, employees name. who's working on the job or is taking them off in the put on the rack appropriately in our improvement activities, we are in the process of rolling out and have done it across one line in the three seven factory and are now expanding a more electronic bar chart type system that keeps that track of those parts more electronically allows us to know exactly

08:04:54:18 - 08:05:17:10

Unknown

where the parts are and, better traceability and compliance to filling out the paperwork with those parts as well. So that's one of the improvements we have made to better parts tracking. Is there a task card specific to the removal and reinstallation in the mid exit door at the bowing door team would have available to them the details, all the steps required to perform that task.

08:05:20:08 - 08:05:52:14

Unknown

And a removal is needed. there will be. Steps or if required, what those steps are to remove them. Engineering can provide that manufacturing engineering can provide that if it's required to do that as part of the the removal documentation, one of the complexities of our removal system is in this came up sometimes there are two forms.

08:05:52:16 - 08:06:12:28

Unknown

There's a long form and a short form. Things that need retesting that need questions from engineering that need a lot of instructions. Those go on the long form, and that is the kind of material that is provided on that form. The short form is something that would be very simple. so a ceiling panel could be removed and then reinstalled without a retest.

08:06:13:06 - 08:06:36:03

Unknown

a seat bottom cushion, although that's an exempt one, but something that could be very simple to install or reinstall without a full retest or engineering statement for. So, to confirm my last question, task card meaning list of checklist of items that they do when they do work with the door. is it's not based on mechanic knowledge or experience.

08:06:36:03 - 08:07:05:24

Unknown

There is a list of steps to do the. My understanding is I need to validate this, but that, that is provided to the mechanic for items on the long form particularly. Yes, such as the plug. Thank you. No further questions. Thank you. Alaska. Mr. Tidwell, thank you. Jeremy. a couple of quick questions. Miss Long, can you talk me through the tier one, two, three review process?

08:07:05:27 - 08:07:34:06

Unknown

And let's get specific to the, the status or what would have been elevated with the door removal and how it was resolved. And was it resolved at the right level and, and the process as it was defined then, is that process the same today? the tier one, two and three, we have an actual team meetings at the start of shift.

08:07:34:08 - 08:07:58:14

Unknown

Tier one is really the meeting between a manager and their crew. It's the start of shift crew meeting. you talk about what you need, what's going on in your group. That's the baseline. every day on first and second shift, there is then an escalating level of tiers. There is a meeting where the first levels meet with their senior manager.

08:07:58:14 - 08:08:28:13

Unknown

There's a meeting where the senior managers, and executives meet across the factory, and then there's a tier four where it gets, elevated to the, highest level executives on the program, mostly things get worked at the team meeting when they go to, tier two. An example of something that would go to a tier two is if an employee in Flow day six needs help from a meet and an employee in slow day three at the tier two, they would get together and say, hey, I need your guy from day three to come down here and help me do this work.

08:08:28:13 - 08:08:52:13

Unknown

And they would talk about the priority. So the people down line would say, yeah, I'll prioritize. Somebody get it down there to you. But, and so what happened in this case is it wasn't getting done. Mike attends some of our tier meetings. I've been at many a tier meeting with Mike. And if there is a spirit item that's been elevated for help and we need help, we often say to Mike at the tier meeting, Mike, we we need you to reprioritize this.

08:08:52:13 - 08:09:16:19

Unknown

We've, you know, need somebody working on this job today. and so the tier meeting is effective in that way. It's a communication tool. If something is lingering, it allows management visibility to get it done. So in that way our tier meetings continue. And they're an important way of communicating across our factory. the the part that that did not work well is just how long it took to get this issue resolved.

08:09:17:15 - 08:09:36:09

Unknown

we've talked about the the back and forth between whether the initial submittals were acceptable to Boeing. Mike is right. It is ultimately a Boeing call. It was not acceptable to Boeing. That went on too long. We've talked about that and are in agreement that it can't last that long. But once we got to the tier two and three, I think the tier two is on a Friday.

08:09:36:09 - 08:10:06:03

Unknown

The tier three was Sunday. The work started, and started moving that part and getting help started to move. it we need these things to not drag out that long. That part was not successful. That didn't work well. Thank you. Mr. Riney. Do you have any, different perspective on that? No. I think when things are elevated and as miss on spoke to, I do attend those meetings.

08:10:07:17 - 08:10:36:11

Unknown

when there are help needed requests. the only. Issue for us is we we always will look to help from. While we may be asked for help, we will in turn always be asking for help from Boeing. if there's there's a access or that type of thing that's needed. Okay, great. Thank you. one more thing on the the lockout tag out program, truly is a safety program.

08:10:36:11 - 08:11:03:29

Unknown

Knowing who's on that barge or whatever their position is. But, it seemed like there was some different, perceptions on how that process is used on the floor. Is this something that you audit or you're able to take a look at and see what the compliance rate is from a safety perspective? Not necessarily. What are the what are the technicians a safety first is that being reviewed.

08:11:04:01 - 08:11:40:20

Unknown

It is being reviewed. And that's one of the it's being reviewed. The role that I talked about earlier, called a GC, is the person who helps us control this on each aircraft. we are looking at that GC project process. I will tell you, it's stronger right now in Everett than it is in Renton, where retraining or strengthening, across all locations, but, particularly in Renton, we've gone back to the documentation and we are conducting audits.

08:11:40:25 - 08:11:59:05

Unknown

We're conducting compliance audits on the factory floor to ensure that we are complying with that lot of program, that lot of program. To your point is safety. It is the key of keeping our employees safe. And we're really passionate about making sure that the airplanes safe before we have people work on it. Okay. Thank you. No further questions.

08:11:59:07 - 08:12:21:26

Unknown

Thank you very much for thank you, chair. as one, you talked about concerns being elevated to management. tiers two and three via the city. Can you help us understand why CMS is and also used to document those concerns?

08:12:21:29 - 08:12:47:11

Unknown

Safety is described as a communication tool, primarily. FEMA's is the system where the work is documented on. So any time we work on an installation plan, a rejection tag that is in seamless, that's the system that shows what work was done on the airplane, the employees that did it, that it was complete, that our jobs are complete, that our airplane was built complete.

08:12:48:19 - 08:13:07:01

Unknown

in terms of saying, hey, this is a priority. Could you get somebody down here? That is what we use the SAP system for because that is the communication. It's not the record that I did it, but saying I this is really turned hot. I need somebody down here or I found something and I need somebody who has the skill that resides back in the different part of the factory into.

08:13:07:01 - 08:13:27:10

Unknown

It's just it's the way we ask for help or talk about the communication. When we find something where a CMA is really the record of the work that was done on the airplane, maybe not the ask for help that came, but the work that was done on an airplane, that's the way the systems are set up. Thanks for the clarification.

08:13:27:12 - 08:13:55:12

Unknown

No more questions. Chairman. Thank you very much. FAA thank you, chair. So going back to my previous questions, about AOG and s t, would they have been required to write a paper, that required removal paper open and close that door? Would that have been in C mass? Yes. That's the only question I have for you. Thank you very much.

08:13:55:15 - 08:14:01:08

Unknown

I am.

08:14:01:10 - 08:14:27:22

Unknown

I think again, on the process to determine whether removal was necessary. it was elevated. Was was it elevated from tier one to tier two to tier three to make that decision? Is that what the

elevation, within the system was referring to on who was going to make the decision for a removal? My reading of the elevation of the SAT system was to get the work done.

08:14:27:25 - 08:14:50:00

Unknown

It was the people saying, we need this rivet rework done. The conversation came as the people were talking back and forth about, okay, what is it? Which model is it? Do we need a removal? it wasn't the elevation to get the decision, it was the elevation to get the work completed as it continued to proceed down the factory floor.

08:14:50:03 - 08:14:54:08

Unknown

Thank you.

08:14:54:10 - 08:15:27:25

Unknown

No more questions, for I am here. It is. No questions here. Alpa. Thank you, Madam Chair. this question is for Mr. Rainey. your comments earlier, you noted that your contract employees are changed with the fluctuating demand. Given that, how do you keep track of who's been trained on what tasks like door removal and installation? Again, none of the spirit contractors would do any door removals.

08:15:28:08 - 08:16:14:18

Unknown

the tasks that they would be assigned would be more rework related. whether it's again, some examples missing mis located brackets, open holes, full marks, that type of thing, that type of. Deal is or that that type of the initial training, or their onboarding would determine that, from their resume and the, assessment that's performed now, there's an assessment performed in Wichita, and then an additional assessment performed in Renton by Boeing.

08:16:14:21 - 08:16:42:23

Unknown

Really stated that, you only require sheet metal experience when you hire an inspector. As an inspector, have more specialized experience applicable to what they're inspecting. So for the hiring of the inspectors, it would be their inspection history. There. what work they performed as an inspector. of course, due to the type of work that they were performing.

08:16:42:23 - 08:17:14:05

Unknown

Yeah, it would lend itself to be those types MRO or previous Boeing. work history, that type of thing. not necessarily, specific inspection. job that they, they may have had. Though to confirm it's not just sheet metal experience you're looking for in your inspector. Correct. Thank you. No further questions.

08:17:14:07 - 08:17:43:16

Unknown

Alaska. no questions at this time. Thank you. And far no further questions. FAA yeah, two quick questions. You mentioned the pre rig that's done by spirit. Is that correct or any. Correct. And then there is the the final rig on the door plug. And that is done by. Boeing. And and who does that final rig. And it's a Boeing employee.

08:17:43:16 - 08:18:15:13

Unknown

But what part of the team adore employee. The door team does the final rig okay. Thank you for all my questions. Thank you chair. Thank you I am no further questions spirit. No further questions. Chair. Alpa further questions. Anyone else have questions? All right. Moving to the Board of Inquiry. can you pull up exhibit 11 D?

08:18:15:16 - 08:18:44:18

Unknown

How she pulls that up? I do have a couple of questions. Just to clarify, we do not know specifically when or who. This when the door plug was opened and we do not know by whom. Correct. Same with closure. Correct. Okay, great. What I want to know is what happened to the hardware. So typically when hardware comes out, you open a door and hardware comes out.

08:18:44:18 - 08:19:16:27

Unknown

Where does it go? It goes on our work in process rack. And it I heard you say you had a policy to use new hardware. So hardware that would be removed, would that be discarded? Or I may have misunderstood that. That is what we have done on this plug when we were doing our mom. Now that we post accident, when we are fundamentally taking it out every time, double checking it, putting it back together, that's when we are always using the new hardware.

08:19:16:29 - 08:19:52:06

Unknown

When I inquired, does it would it have had to have been in the past? That was the answer was given. If the hardware is in perfect condition, fully conforming, it could have been used again. So it could have been used again on this, on this plug had it been in perfect condition. Correct. And in this case, if that it was that clear with all employees that, that you would reuse that, hardware or some employees might discard the hardware and get new hardware, it could happen either way.

08:19:52:06 - 08:20:12:03

Unknown

Okay. our general approach is when you take something off an airplane, you check to make sure that it's still fully conforming. That's a check that an employee does. If it has a non

conformance on it, it gets processed differently. It has a tag that goes with it. It gets put in a different process and either reworked or scrapped discarded.

08:20:12:05 - 08:20:43:01

Unknown

If it's in perfect condition, it goes on the work in process rack and can be reused and reinstalled. We do not have hardware for this door door plug. That is correct. Okay, great. on the, ship side action tracker, which I know was very redacted here, but I'm going to ask some questions. And just going back to some previous, responses, I just want to clarify, the actions here started on September 1st.

08:20:43:01 - 08:21:10:04

Unknown

I just had them, lay on a move up to the 12th because I have some questions. around the 12th is when access started to be discussed. I know earlier you said there was some discussion of whether it was a door plug or a door. I don't see that in the unredacted version. So I see there's a lot of references to access accesses needed or no access is provided.

08:21:10:06 - 08:21:41:11

Unknown

Then I see a lot of references to door, but it seems to be unclear whether it's a door or a plug. Do you agree with that? But you've seen the other I have. I have the is that clear? That was absolutely a dialog upfront. Is it a door or a plug? I'm sorry, maybe not in the SAT. the access that was needed, I, I apologize for that.

08:21:42:07 - 08:22:15:14

Unknown

in the SATs, as I think about the SAT, it was we need help. We need access to the door. We need a stand. I see, so where did that discussion occur? Whether it was a door or a plug? Not in the. I don't see it in the SAT. I want to be really respectful in the in the factual report on the public record, it was referenced that we had the SAT, but we also had looked at, some texts between mechanics or other text, and that's where I had seen that.

08:22:15:21 - 08:22:41:08

Unknown

Understood. Okay, great. I have a question. I have a question about the tier change. And I know there have been lots of questions. And so, Laney, if the tier change, we go from 1 to 2 on September 14th. If you can show that. Scroll up a little.

08:22:41:11 - 08:23:11:23

Unknown

It may not be here, but on the unredacted version, it's in bold. Tier change 1 or 2 with dollar signs on both sides. And then on the 17th, there it goes. From 2 to 3 again. Bold tier change 2

to 3, meaning it's elevated. There's urgency. We need this addressed again. Dollar signs. 18th. It goes back to 3 to \$2 signs.

08:23:11:23 - 08:23:37:25

Unknown

There are other automatic notes in here without dollar signs. Why the dollar signs? What does the dollar sign mean? The dollar sign is what the system uses when it gets elevated in a tier level. So when it gets elevated to a tier level, the dollar sign references, the elevation process of the tier process it has no reference to.

08:23:37:27 - 08:23:59:19

Unknown

I'm just want to make sure I'm clear it has no reference to hey, this this has been going on quite a long time. This is costing us money. We need assistance. I have I have no idea why. The dollar sign is the sign that is used when you elevate it. But it is. It is the sign. It has been elevated in a tier level.

08:23:59:26 - 08:24:26:23

Unknown

That change was set up in the Who along before I got here. Thank you. No, I just wanted to clarify. Thank you. Member Grimm. Thank you. Chair. line, I want to thank you for taking us through the flow of, the unit number in question. I do have some clarifying questions on that. You did state on, flow day nine that there's a fit and fair check.

08:24:26:24 - 08:24:56:19

Unknown

Is that correct? And it's external only? Yes. Okay. now the the door work and the door being removed happened on flow day ten. And I think there was about three days in there. Would that have triggered this to be done again? To be checked again in a perfect world. In a perfect world, as a part of, reinstalling that plug, we would recheck the fit and fair.

08:24:56:21 - 08:25:22:28

Unknown

Okay. Did that happen in this case? There's no documentation that I've seen that that happened in this case. for removing the door plug. Is it only a door crew member that can remove and reinstall the door plug? Is that is that fair to say or can somebody else. Well, I would say we just had that conversation. I believe it is a door crew responsibility.

08:25:22:28 - 08:25:50:03

Unknown

But I was reminded and accurately so that people like EOG or other highly trained employees that are multi-skilled can also do it. Okay, so I talked earlier in panel one about the process that when the nonconformity on the rivets was identified and, basically a NCO was written that would

not necessarily trigger a removal to be written yet.

08:25:50:03 - 08:26:31:16

Unknown

Is that correct? That's correct. Who would trigger a removal? It will be written, would it be spirit going, hey, I need the door open so I can do the rivets. Ideally, yes. And then the employee who realizes they need to open the plug. And we talk about this all the time. So I'll just respectfully say plug not door because the doors at different circumstance, but with the plug, when an employee says, I need to open the plug, that employee needs to say before I open this previously installed assembly or, action, I need to go get a removal.

08:26:31:18 - 08:26:59:07

Unknown

And so it's that employee's responsibility to in September. Right. The removal or ask for help from someone to write a removal before it part to remove from the airplane. Okay. So since a spirit employee or contractor cannot do that, then it has to be a Boeing employee that helps them. It does. Okay. Does let me ask spirit, do your people that work that worked on the rivets or and inspect the rivet work?

08:26:59:10 - 08:27:25:24

Unknown

Do they see the NCO? Yes. They have access to seamless and they have the ability to stamp within. And they have the ability to stamp it. Correct. Do they see the paperwork for a door removal? I don't believe that. They they saw that information. Okay. Did it Misalign do they have access to see that paperwork? They didn't. They?

08:27:25:24 - 08:27:53:18

Unknown

My understanding in Mike knows better than me have access to see really the the part of the paperwork that applies to their work statement only. Okay. Now, when I asked you earlier about the process, when they finish their work, there is a stamp on the NCO by the the mechanic that did the rivet work. There's a buy off by, spirits, QA Inspector.

08:27:53:21 - 08:28:19:20

Unknown

And then you said that Boeing would buy it off, but after the door plug is installed. No, for the NCO, for the rivets in and of themselves, they would stamp it after the spirit quality inspector or that NCO, that NCO just says, fix these five rivets, stamp that so that. So the Boeing's going to come in and inspect the work and buy it off.

08:28:19:23 - 08:28:53:01

Unknown

Yes. And I think if I'm correct, I saw that on the NCO on 919 at 1811 that a Boeing quality

inspector bought off and stamp that if I remember on the NCO correctly. At that point the door I believe would still be open the door plug. I believe that is true. What should that have triggered next? Should the inspector have called for a reinstall or what?

08:28:53:03 - 08:29:15:13

Unknown

Yes. So the next step would be, likely the manager in the area to say the next job that we need to go complete is the reinstallation of this plug. Okay. The manager but not manager, the inspector, not the quality inspector. Okay. So there was an opportunity missed there to see that there was the removal paperwork was not there.

08:29:15:16 - 08:29:51:19

Unknown

Correct. Because that inspector and then to off there NCO we don't see anything from a manager stating anything like that. Correct in the documents. Correct. But we have a gap. Thank you. Chair. Member. Gentleman. Thank you. Chair. This is a question for both of you. If you could just kind of follow me through here. according to the manufacturing records and human performance, factual report, the four bolts that prevent upward movement of the door plug were installed by Spirit on July 28th, 2023.

08:29:51:21 - 08:30:18:00

Unknown

The factual report indicates further that that was done during the completion of a specified production order. Those details all appear just FYI on page 12 of the factual report. Do either of you dispute this narrative that the four bolts were installed by Spirit on July 28th? I do not I do not. And is there any evidence that you know of?

08:30:18:00 - 08:30:39:20

Unknown

I do not. Is there any evidence that you know of that? The door plug was reopened between the date the four bolts were installed, which again is July 28th, and the date the fuselage was delivered to Boeing, which I believe was August 31st, 2023. There is no evidence that I know of.

08:30:39:22 - 08:31:05:03

Unknown

I do not know of any other. So is there agreement between Boeing and Spirit that the four bolts were properly installed and in place at the time the fuselage was delivered to Boeing? I believe they were. Thank you. this next question. I'm not suggesting there's anything untoward about this at all. I just want to factually clarify, I think it's exhibit 11.

08:31:05:03 - 08:31:53:16

Unknown

A no need to pull that out, but exhibit 11 A shows a photograph of, labeling on the door plug,

and that labeling indicates that it was intended for line unit 8799. The fuselage on which it was installed was actually 8789. So those two numbers don't match up. Is there anything particularly unusual or problematic about that? No. Within Spirit's production system, the use of Reallocations is, available for us, when there could be some part availability or, concerns with the original installation there.

08:31:53:18 - 08:32:25:08

Unknown

There could be, another installation that's used in its place. Okay. Thank you. similar sort of question. Not suggesting there's any issue at all. Miss one, this just for clarification. it's my understanding that there's a security video. system in the factory. and that video is retained at least for some period of time. There is no video footage of 8789 during production.

08:32:25:08 - 08:32:50:17

Unknown

Could you just explain why that's the case? I believe I understand that that security footage is rights over itself every 30 days. And because the airplane was built in the September time frame, the accident occurred in January, at which point we went to go look at the footage. It had been rewritten over itself because it's a 30 day time frame that it's kept for.

08:32:50:20 - 08:33:03:00

Unknown

So this is frankly not unlike the cockpit voice recorder issue. It's been overwritten and it's no longer available. That is correct.

08:33:03:16 - 08:33:29:13

Unknown

just for actually chair, I'm going to save my questions for the next round. Thank you. Thank you very much. We'll do Member Brown's questions later in the interest of time. So, member Inman, I thank you. so just let me just go back. You originally, at the very start, I know that was seemed like hours ago, and it may have been a couple of hours ago, so there were no significant issues in the manufacturing.

08:33:29:13 - 08:33:33:27

Unknown

The door plug that were found, is that correct?

08:33:33:29 - 08:34:04:10

Unknown

Correct. What rises to significant? In my mind, it would be replacement of structure that was original to the door. The reason the reason I bring it up in the manufacturing records and human performance factual. It mentions that there were discrepancies that were found during the manufacture specifically for the mechanics not reporting the torque wrench and serial numbers

and the production order, and for not providing the sealant complete information on the production order.

08:34:04:13 - 08:34:33:10

Unknown

I did say they were later corrected in the system, but they were additionally found as an issue. Do you see that as a recurring issue? No. There's processes in place to have those addressed by engineering, when they're identified. There's also processes in place to close the door, whatever it's taken out. I agree. Okay. Can we, I also want to just, go back and we were talking about the timelines.

08:34:33:17 - 08:35:00:02

Unknown

especially I was interested about the question on the blanket. did we actually identify that the blankets were installed? I know it was okay to install on September 20th. Were they installed on that date, or do you know, Miss Lund? The the blankets were mostly installed. I believe the picture that was shown earlier in the presentation showed a blanket kind of pulled back out of the way.

08:35:00:18 - 08:35:45:06

Unknown

so we were that that shows they weren't fully installed at that point. Then the okay to install was given, I believe it was on the 20th. and at that point it did precede the blanket. Let's drop back down and the rest of the build proceeded. Okay. Can we pull back up the, Boeing manufacturing timeline that she referenced earlier?

08:35:45:09 - 08:36:06:18

Unknown

I'm just going back to this, just to try to understand something on here. It was on nine, nine, 15. And again, it was a slow day. Ten, where we talk about the tier two on the 16th and 17th. Those were weekend day, right? Correct. But it appears that this got elevated to a tier three in the SAT tracker.

08:36:06:18 - 08:36:33:27

Unknown

And I'm going to go to the stat tracker in a moment. And then it was also the door crew manager made notes or other managers did with is that a Sunday production time? That would imply to me that people were working on Sunday, but would that have also been another flow? Day ten it was sitting in flow. Day ten the difference in a time day or a business day and weekend is we don't load new jobs.

08:36:33:27 - 08:36:58:02

Unknown

It's not a day. We typically move the airplanes. It's a day when we would complete incomplete work. If we have a team working or catch up on something, would that be Boeing personnel or contract? Boeing doesn't have manufacturing contractors. All of our employees are fundamentally IAM employees. They're full employees. And so it's Boeing personnel. And if spirit were to work on that day, it would be their contractors.

08:36:58:02 - 08:37:16:17

Unknown

If we have heard okay, so can we pull up then just to ahead and get to that then page 26 of the Manufacturing records, Human Performance.

08:37:16:19 - 08:37:35:03

Unknown

This is actually kind of a chronology. I know earlier the chair was looking at it, showing a lot of different thing going here. And I'm going to actually ask, Mr. Rainey again earlier, you also said that you don't have access to the set that. Correct? Correct. There's a lot of references in here in this group. Factual report.

08:37:35:03 - 08:37:40:27

Unknown

Now, specifically, if we can drop down just a little bit.

08:37:41:00 - 08:37:48:02

Unknown

Okay. We can stop. So I'm going to go back to say the,

08:37:48:04 - 08:37:58:29

Unknown

Real spirit management on September 15th. Access and removal needed. That is a Boeing employee putting that in there. Correct.

08:37:59:02 - 08:38:08:15

Unknown

Even on September 18th, doors being opened by a mechanic at 11 a.m. spirit Manager access is now available.

08:38:08:17 - 08:38:24:24

Unknown

I would also be, Boeing employee inputting those comments. And so they're entering comments on your behalf. Correct? Okay. And this is happening again on I believe the 18th was the Sunday.

08:38:24:27 - 08:38:51:26

Unknown

17th. We'll go back. The 18th is on Monday. Yeah, on the 17th. No access. And it was elevated at that point on this Sunday at 354 from a tier two to tier three, which obviously, as you said, gets a lot more notice throughout the plant on a Sunday. It's elevated like and who is like light side control center, the group of employees who are next to the airplane that help okay.

08:38:51:26 - 08:39:10:26

Unknown

They're going to coordinate with the first shift to gain the access which which includes opening, removing. And then at 615, the senior manager worked with the door crew manager to determine if the door can just be open or if it needs removal. And it gives me the appearance that Spirit and Boeing were all trying to get this point done on Sunday.

08:39:10:28 - 08:39:39:22

Unknown

Is that correct? yes. And then at 7 a.m., whenever the first crew comes on, it was downgraded them from tier three to tier two. Got it out of the management's review at least a level down. Yes. Saying that it was doors being opened by the mechanic. I guess the question is if Boeing if the door crew manager was knowing at that point, was it the manager who would have anticipated writing the order for removal, or were they a mechanic who was getting the instruction?

08:39:39:25 - 08:40:01:16

Unknown

The mechanic typically writes the removal. And so it's a mechanic at that time. At that time now it's the. Yes. So at some point between 7 a.m. and 11 a.m. on September 18th, that door was opened. Yes. Okay.

08:40:01:18 - 08:40:40:25

Unknown

Sorry, I'm over my time. I wait for her to, tee up another one and say, okay, great. No. You're fine. Mr. Rainey, question per contract for your, contractors. what are the hours and days that they work? When, requesting contractors, we state that they need to be available, either first shift or second shift, and it's typically a Monday through Friday, work week.

08:40:40:25 - 08:41:07:13

Unknown

But there is overtime available. There is overtime. You mentioned earlier Monday through Friday typically unless the weekends required from about. I thought you said 630 to 230 or 6 to 230 is the normal first shift hours? Does it? we interviewed mechanics who reported working 6 to 7 days a week. Pretty regularly and normally working anywhere between 10 to 12 hours a day, one said.

08:41:07:13 - 08:41:38:04

Unknown

That's just our typical schedule looks like. But in an eight hour shift contract. So on paper, it seems to be weekdays from, you know, 6 to 230. There was reference to 8 to 4, but in reality these individuals said they pretty regularly work 10 to 12 hour days, 6 to 7 days a week. Does that surprise you? But normally they they do work extended hours or multiple days.

08:41:38:04 - 08:42:09:03

Unknown

And that's normally by choice. if we have the work available, it's a voluntary basis. a, Boeing employee said there is pressure to, to get things done on the floor. One said yes, it's always go, go, go. And others said their priorities are figure out why jobs are behind schedule, job behind schedule or jobs seems to be a common acronym.

08:42:09:20 - 08:42:36:29

Unknown

and then they go on. That seems to be the big push. It seems to be more important than knowing your own employees, making sure we're on schedule with the contractor in response to us asking about whether that person feels pressured, to complete work or they're looking to do overtime, they had made very clear both many contractors had made clear it's not for overtime, but that there's pressure to do work.

08:42:37:01 - 08:42:58:05

Unknown

When asked who applies the pressure, the response is going going, basically, because basically it seemed like a block for them to install their lives, a block for them to install the floorboards. So because they're trying to meet demand, it's pressure. They're like, it needs to get done today and the power's off on this plane, but we have to have it back tomorrow.

08:42:58:05 - 08:43:21:07

Unknown

So and it's in this flow day or that flow day and they have to get done. another one said when we're very overwhelmed with the work, it is pressing because everything we've cut down on some personnel. So now it's like to order for me, in order for me to not have to deal with the worst situation tomorrow, I'd rather work 12 to 13 hours shift today, to get it done.

08:43:21:28 - 08:43:34:29

Unknown

because the pressure is very heavy. It does get heavy. I feel like it does. Does that concern you that there is pressure?

08:43:35:02 - 08:44:15:14

Unknown

For your contractors? Or that they feel pressured? I think the very nature of why we're there, our

entire job is to get out of Boeing's way. we understand that we are inhibiting them from, their follow on activities for their build, but I don't see it as, standing over them, telling them that they have to get it done in an unsafe or, a manner that would inhibit quality of the product there.

08:44:15:14 - 08:44:48:21

Unknown

Their role is to perform the rework and allow Boeing to continue with their build. Would you agree that, a these contractors and others who feel that there is pressure to work, that fatigue and that pressure can have an impact? Yes. And that's why we offer the overtime as a voluntary basis. It's not a requirement. Are you tracking how much overtime is being worked?

08:44:48:23 - 08:45:00:20

Unknown

I view the time cards of the individuals from a safety perspective. The.

08:45:00:22 - 08:45:19:11

Unknown

The the mechanics that I talked to, they understand their role as, the work that they're performing and I believe that they are there to perform that role.

08:45:19:14 - 08:45:42:27

Unknown

And they have not elevated those types of issues. the, the fatigue or, unwillingness to come in, on a weekend or that type of thing. Well, they certainly made very clear to our investigators that this is an issue I will do if they haven't raised it. Perhaps that's something you should be looking at. I will do from a safety perspective.

08:45:42:27 - 08:46:16:17

Unknown

I will definitely follow up with them. Okay. Thank you. I know I'm at time or overtime. So member Mann Chapman. Graham. Yeah, it's a long day. Hey, you works too. just a couple questions, a couple more. whether the the door plug is just open, where it goes out, what, 15 degrees on the lanyard, or if it's laid all the way out and removed, is a removal required?

08:46:16:19 - 08:46:34:25

Unknown

Yes. And why is that? Because even to open it a little bit, bolts must be removed from the hole for. Correct. I believe so, yes, I double checked. Yes yes yes okay. I yes, I think some people are a little confused. If you just open it a little bit. Now you got to take them all four out.

08:46:34:27 - 08:46:59:05

Unknown

That's a big deal. Where else would, somebody on the line see the removal paperwork? It is. It's

in CM. CM. Yes, yes. Okay. Would there be any mention of it? at the ship's, ship side action tractor tracker. There could be as as has been referenced here. And that's just the communication, like, hey, I need a removal.

08:46:59:05 - 08:47:37:09

Unknown

Yes. Or a I need a reinstall. Hopefully that would trigger somebody to be looking for that removal paperwork. Right. Okay. I want to thank both the witnesses. That's all the questions I have here. Thank you. Thank you. Member Chapman. Thank you. Chair. just just to put it out there, Boeing's initial review and reviews since have, have have determined you've not found any paperwork indicating that this door was authorized to be opened and then authorized to be closed.

08:47:37:09 - 08:48:03:24

Unknown

Is that correct? We've not found any paperwork. That is correct. member Inman went through the, details of what's in the the SRT record, which indicates that the door, would have been opened. The door plug would have been opened on the morning of September 18th. 7:00. There's an entry. The door is being opened by a mechanic.

08:48:03:27 - 08:48:38:15

Unknown

717 another entry, the doors being open per the door crew manager. At 1005, there's an entry indicating, that a spirit manager confirmed that access was available. I assume what that means is that access was available. Do the repair work on the rivets. That is the way I read it to okay. At what point during this apparent timeline should have should there have been a trigger for a requirement for the paperwork?

08:48:38:18 - 08:49:07:19

Unknown

The paperwork should be filled out and completed before the act of removing the part from the, airplane or opening the plug. So when the employee who is ready to open the plug before they open the plug, they need to fill out the removal paperwork and then proceed with the removal. That's that's where it should have occurred. So we have entries in the morning of the 18th.

08:49:07:22 - 08:49:43:20

Unknown

And these are basically for communications purposes. Correct. Indicating that the decision basically has been made to open the door. We don't we never see the actual paperwork. We just know that the door got opened. So it was somewhere in that window that, the, the discrepancy from what should have been the procedure occurred. Correct. should should the lack, I mean, ideally, should the lack of documentation have prohibited continuation of the work?

08:49:43:23 - 08:49:58:12

Unknown

Yes. And similarly to the lack of appropriate documentation, have prohibited the final acceptance to close the non conformance order.

08:49:59:24 - 08:50:24:05

Unknown

the non conformance order that was bought off and closed really was for five rivets. Okay. And it was that spirit's job and the, the Boeing inspectors job to what they were confirming is what was on that NCO. And that NCO only said these five rivets need to be removed and replaced on under scrap it. They looked at it.

08:50:24:05 - 08:50:43:27

Unknown

They look for the drawing said yes, it's good. The inspector for doing that would not have necessarily known. Now I need to go look for the removal. The removal is a different piece of paper. It has a quality stamp. It would have had. It would have had the person come and stamp it when we reinstalled from the removal.

08:50:43:27 - 08:51:10:00

Unknown

That's where that quality stamp would have happened. In terms of removing the removals, I don't think that quality inspector, they were there to buy off that piece of paper, which was about the rivets. So help me with this. Tell me if I've got this right, what should have happened once the decision was made to open the plug somewhere soon after that, there should have been essentially a trigger requiring paperwork.

08:51:10:03 - 08:51:36:29

Unknown

The work should not have progressed, ideally without that paperwork. And then once the, work was completed, the removal documentation that should have then triggered the closing and the signing off of the fact that the plug was closed, and secure it. Right. That is how it should happen. Correct. Okay. Thank you very much, chair. That's my last question.

08:51:37:01 - 08:52:04:00

Unknown

Thank you. Member Inman. Thank you. I'm going to, And I hope I don't drive you crazy, but can you bring up, 11? Oh, please. And, actually, on the bottom of page 41 of the actual document.

08:52:05:12 - 08:52:10:15

Unknown

41.

08:52:10:18 - 08:52:29:22

Unknown

The bottom of that page. So we're looking at this, and this is one of the, basically a spirit contractor who had been working at Boeing, I think, through a couple of different subcontractors for about five years. And, the question at line 20 is, you said you're working 6 to 7 days a week. You guys experienced a bit of fatigue.

08:52:29:22 - 08:52:41:20

Unknown

Yes, because it's so demanding to try and keep up with all the work. But sometimes our jobs take really long hours. Scroll down a little bit onto the next page.

08:52:41:22 - 08:53:04:11

Unknown

All right. Do you feel pressure to complete the work sometime? Yes. Who is that pressure from? Boeing basically seems like a block of time to install their labs. Mislán. What do you think about that?

08:53:04:14 - 08:53:27:19

Unknown

I feel like, There is some inherent pressure to get the job done. I can understand why they feel that. What they're saying is, when you look at the bar chart that was referenced earlier, the next block is somebody else needs this job done so they can complete their job. One of the things we talk a lot about is in aerospace.

08:53:27:19 - 08:53:48:29

Unknown

There's sometimes there's operational pressure. There's operational pressure to release your airplane on time. There's operational pressure for us to build and deliver an airplane. What can never happen is to sacrifice quality or safety for operational pressure. And we go back to that exact same document except go to page 54.

08:53:49:01 - 08:54:16:06

Unknown

This was a little disturbing. And I know, Mr. Carney, you weren't part of this, statement, but he kind of called out a little bit of what? Maybe the bigger issue. But then at the very bottom line, 23 or 21, how do you feel the interaction is between spirit and spirit? Contractors in the Boeing mechanics? Well, basically, we're the cockroaches of the factory.

08:54:16:08 - 08:54:52:05

Unknown

So respectively I don't know what was respectful about it, but it was a little bit concerning to see that. I guess running. What do you have to say to it? We're outsiders. We're in as part of our

team's presence in the factory. We're in the way, we're doing our best to get out of the way. As I stated earlier, these individuals, they're they're not,

08:54:52:07 - 08:55:30:00

Unknown

Boeing employees. but they are there to perform a job, but, I, I have not heard specific instances that Boeing teammates are treating them disrespectfully. I think, they just understand that their role is consistently between them and Boeing completing their work and and they are doing their best to remove themselves out of the out of the Boeing team's way.

08:55:30:02 - 08:55:57:05

Unknown

But again, I have not heard specific instances where they've been treated negatively. if I would have, I would have raised the to the Boeing team. And I have no, worry that that would have been addressed. And I realize one employee that's an independent contractor, it may not be the views of everyone, but I'll just handle that one for you.

08:55:57:25 - 08:56:16:04

Unknown

and I would note in several of the transcripts, a few of the subcontractors said they would suggest to their friends that they should go to work for Boeing first in different ways, because everyone has a different reason, flexibility, training and things of that sort. So I don't want to leave that just totally hanging. But it's a very descriptive sentence in a very important issue.

08:56:16:06 - 08:56:24:20

Unknown

And we'll I have a few more seconds. Can we also go jump to page 61?

08:56:24:22 - 08:56:40:02

Unknown

And, and I guess for the people that are watching this one, you all have seen all of this before, even before today opened up right? Yes, yes. We're down to the bottom on,

08:56:40:05 - 08:56:56:23

Unknown

Questioning is basically starting with what safety management systems means. just something for me. Looks more like a system for safety is in the airplane. I don't know, I actually don't even know that word. Drop down to the next page, please.

08:56:56:25 - 08:57:18:29

Unknown

Safety culture makes more sense if you go down into basically 112. I don't really think. I think it's just that they have on the walls and that they're talking about it like the farthest. And FOD is

really, really a big thing. But other than that, they have posters on the wall I don't really like have like a concept thing.

08:57:19:01 - 08:57:54:00

Unknown

A little concerning. It is concerning, there is no doubt about it. We, as we mentioned earlier, started implementing this safety management system. And I think part of it is that that term, you'll notice through here that the employees can talk some of the specifics. They could talk the importance of tool control or compliance. But as we were rolling this out, we did not have it fully to the factory floor when either the Axx 103 panel or at the time of the accident had had fully deployed to the floor.

08:57:54:06 - 08:58:14:14

Unknown

This is a, big priority of us right now taking it to the factory floor, helping them understand what the safety management system, helping them understand what their role is in the safety management system. And we had not fully educated the people on the floor at all such that they knew what safety management system really meant to them.

08:58:14:14 - 08:58:41:27

Unknown

And that's a that's a deployment of the safety management system that we're working on. hard right now. If chair, if I can have a couple extra seconds. Mr. Elliott, this is not a name that's redacted. The person who gave this information to us and is the chair said earlier the party system was very important. I hope by me calling out this person and their statements, we won't be looking at a situation where they might face adverse action for telling us the truth.

08:58:41:27 - 08:58:47:23

Unknown

During their statements. That makes sense.

08:58:47:25 - 08:58:52:18

Unknown

You state the question again.

08:58:52:20 - 08:59:18:01

Unknown

Would you like to speak for me? I'm done. He wants to make sure that by raising these concerns, that these contractors will not be retaliated against by spirit or Boeing, no. Okay. So then that I'm going to actually, Miss Lund. Yeah, I was just going to concur with Mr. Riney that they will not be retaliated by Boeing for that portion of their question.

08:59:18:03 - 08:59:47:28

Unknown

I'm thank you. And excellent line of questioning. I'll have some questioning along. safetyculture and SMS tomorrow, but I do I want to continue on with that, line of questioning. I did feel like the comment, this is a very experienced person, somebody who's been on scene for or on in the factory for quite a long time, not somebody who's new, seems, to do excellent work.

08:59:48:13 - 09:00:18:27

Unknown

so I, I the, the term cockroach, which, this individual felt, and I'll just give the entire, context, the contractor said when asked, the question about it was about the relationship between, spirit contractors and, Boeing, personnel in the factory. And the response was, well, basically, we're the cockroaches at the factory.

09:00:18:27 - 09:00:45:15

Unknown

There's defects, and they hold up your job. We're looked at as it's your fault because you. How do you do the rework? We do get dogged a lot. And so this seemed to be not a surprise in, the interview, with Miss Lund, who said, I do think which we're working hard to fix, there's a little bit of an us versus them feeling at the front level within Boeing versus spirit on the front line.

09:00:45:15 - 09:01:12:06

Unknown

I don't think the front line loves supplier assist. I think their fundamental position that I hear from them on a regular basis is we shouldn't need supplier assist because they should send us these perfect fuselages regardless. And you can't argue with that. I the. It is all it is August 6th. This interview was done in March.

09:01:12:09 - 09:01:43:18

Unknown

What has spirit done to get information from its workforce on possible pressure, on feeling like they, are, constantly reworking things in Renton and feeling pressure as this moves through flow. I mean, this was a nine, ten day, flow day, which ended up to be 18 days to get this fixed, on which it can't be good for anyone.

09:01:43:20 - 09:02:13:15

Unknown

And yet you have personnel who are reporting, pressure, working long hours and quote unquote, feeling like cockroaches because they're dogged. What have you done since March to address that issue? Have you gotten feedback from your employees? Have you welcomed feedback? You said you didn't look at the time cards for safety. So what have you done since then?

09:02:13:17 - 09:02:44:27

Unknown

Just specific to the the feedback from the team members. I look to my contract managers to provide that. If there's, individuals that feel that they are having issues, I will personally follow up with them to understand what specifically, I can do to help with that. Well, do you know, all those individuals said that there was no feedback system in place for them to provide that?

09:02:45:00 - 09:03:06:18

Unknown

If they don't feel even if you have one, if they don't feel they don't have a that they have a feedback system, how are you going to get that information? You're waiting for them to come to you? They will I will discuss with my managers to ensure that they are soliciting that feedback. Okay, where am I? Okay.

09:03:06:18 - 09:03:21:02

Unknown

Question. NTSB has received reports of employees, Boeing employees being isolated. Miss Lund, can you address that?

09:03:21:04 - 09:03:56:10

Unknown

I believe the employees that you were referring to in this instance were moved, off the line after reviewing the interviews in the information. the text or whatever. There was information that that there were two employees who were likely involved in the opening of the plug, particularly based on what we referred to earlier, their manager, their executive manager.

09:03:56:10 - 09:04:30:00

Unknown

The way these decisions are made is by the executive manager, for example. I would be involved if it were quality employee. I believe the NTSB got a statement from their executive manager, made the decision, which is a standard practice for Boeing. It's a practice that we do frequently that when question arises about an employee's involvement in a safety related issue, we will move them to a lateral position, saying pay same, benefits, same shift, off the airplane while we finish our investigation.

09:04:30:18 - 09:05:01:27

Unknown

and this is in the interest of airplane safety. We, do this as a practice when safety is involved. And, that is what occurred with these two employees. They were moved maintaining pay shift benefits off the airplane while the investigation proceeded. Are they in a lateral position or were they put in a lateral position? They were put in a lateral position in terms of pay benefits in shift.

09:05:02:00 - 09:05:30:00

Unknown

Currently they are they are being paid on administrative leave but same pay. and that was at their request. May I ask two more questions? Were they put in something called building for 20? Building for 21 or 21? Is the building where we build our wings? yes. That is that is the building instead of, for the 20, which is final assembly.

09:05:30:00 - 09:05:51:04

Unknown

The building next door is the wing building. They were moved to the wing building. Have you ever heard of that being called Boeing Prison? Because it seems to be some this is in the transcripts. Seems to be something that is talked about. I did not see it called as Boeing Prison. The jobs that they went to do were reworking, tooling.

09:05:51:07 - 09:06:11:07

Unknown

Their initial project was to, rework some tension barrier straps that have tension, and then it's our tooling. It's an area that we use for, employees who can't perform their statement of work due to light duty or if we move them off the airplane. But it's tooling rework, it's work that needs to be done by our Boeing employees.

09:06:12:06 - 09:06:34:15

Unknown

and, and I will say I've been to that area. I've seen that area. I'm familiar with that area. and I was not familiar that they call it Boeing Prison. It was referred to in our transcripts as Boeing Prison in a cage. Is is is one of the individual work from home right now. My understanding is both were both are both are.

09:06:34:18 - 09:07:02:20

Unknown

Okay, I'm going to come back, to this tomorrow when we get to safety culture. member Graham. Chapman, member Inman. Have a little bit more if we can pull back up. 11, please. And, go to page 73 or actually hang on on that. That's fine. Just hold off. Mr.. Honey, I'm just curious. You, at the very first of your testimony, you started to say each day and I think you were going to say Excel.

09:07:02:20 - 09:07:31:10

Unknown

You get an Excel spreadsheet, maybe. Is that correct? It's a document that is provided by Boeing every morning that details. It's an Excel spreadsheet that details the, defects documented the previous day. And it's a way for us to, because we don't have access to all of the Boeing systems. It, it's a way for us to, understand what's work is still remaining open.

09:07:31:13 - 09:08:16:24

Unknown

And then is that then put on what they call the board? there was a lot to discuss about the board. Yes. So, again, because we don't have access to the spirit system in Boeing, we utilize a large monitor provided by Boeing. where the mechanics, contract mechanics will utilize a handheld scanner, scan the print it out paperwork, barcode, it will auto populate, and it allows us to understand what mechanics are working where, within the factory.

09:08:16:24 - 09:08:41:29

Unknown

And it's easy way for your people also to kind of see who's had discussions with other people. They may put notes in there or attach photographs. there's no attachments. Yeah. It's it's only notes of if they may be held for access or waiting on a part or that type of thing. Okay. And so was that data. Did we get to review that information on the board?

09:08:42:01 - 09:08:55:28

Unknown

I don't believe that was provided as part of the. Okay. Can we go to the we go to page 73 on 11. Oh please.

09:08:56:01 - 09:09:19:02

Unknown

Go down to the bottom and note I'd note that this this statement is taken on March 4th. it talks about the Spirit Access Board or you make notes. Is it archived? You know, goes back each month. They go back and try to find. Yes, I do know recently I think it was maybe 2 or 3 weeks ago I don't know what somebody fumbled, but it deleted an amount of data like 2 to 3 months.

09:09:19:05 - 09:09:50:18

Unknown

Then we started right back up, you know, to autosave. Sometimes. they couldn't. I think they only tracked it back to like January, the beginning of January. Was that data fumbled or erased, or do you have any information of where it might be? Again, it was it's only it's it's not a lot of data. It's only for the manager to, understand where the individuals assigned.

09:09:50:20 - 09:10:23:24

Unknown

So it's not. Any kind of proprietary data. It's not, specific. It's mainly the line unit. And the NCR and the date that the the mechanical. It's more of a tracking system. again, for where where the mechanic work that day. Boeing has all that information available that they could pull through the, mechanics Bams ID for when they stamp on the, the paperwork.

09:10:23:26 - 09:10:35:27

Unknown

But this is more just a trace tracing tool for the managers to understand what was being worked. Do you remember when that data was fumbled?

09:10:36:00 - 09:10:59:14

Unknown

Because I don't utilize it. it's mainly the contract managers. It's not something that is, Tracked by me. It's more, like I said, just a tool for my managers to understand who's working where that day.

09:10:59:16 - 09:11:15:03

Unknown

It's not as significant. part of our process. It was just something, that we put in place to help.

09:11:15:05 - 09:11:41:12

Unknown

With Denver. next. Well, I'll check in a second, because I. I'm hoping. Miss Leyland, can you clarify sort of the shield in shield? Shield out process when you're on the factory floor? Yes. The shield process is the the name of the process we were referring to earlier that when you walk into an area, if it's not your home area, the employees who work there every day are assumed to work there.

09:11:41:18 - 09:12:00:04

Unknown

But when you go to visit the area, whether you are, a contractor or someone working out of position or even a manager, when we come into the area, we use our badge and we want in the area, and then when we leave the area we want out of the area. And that process that we used to do, that is the shield process.

09:12:00:07 - 09:12:21:18

Unknown

Thank you. And the wand in and wand out. What are you is it with your bad? It's a computer system. the baseline is it's the badge you, use your badge. It comes up and asks you what you're doing in the area, what area you're going to be working on, what you're going to be doing, and you fill that out and then you have access to the area.

09:12:22:00 - 09:12:36:16

Unknown

and then when you leave, you check out through that shield. And do you need some sort of pre-approval or you can go in and out, depending on your work. It says if you're going to work on the aircraft and it's a live aircraft, you need to touch base with the GC. As I mentioned earlier, that check in needs to happen.

09:12:37:10 - 09:13:02:01

Unknown

but from a management perspective, when I check in, I say, you know, I'm going to walk around

the airplane or I'll be just walking, not performing any work on the aircraft, and I can walk in and is there some sort of way to track who's shielding in and shielding out? Where is that? Where is that kept? It's kept in the system from the the shield data that we use to go in and out.

09:13:02:03 - 09:13:29:15

Unknown

I will say there are times the system goes down for whatever reason. Then we go back to a paper system and we keep the paper records. Also, how long do you keep those records? I don't know the answer to that. Understood. the reason why I'm asking is in this case, if you were opening, removing, closing a door plug, you would be entering an area where you would be shielding in and shielding or wand in when I'm trying to use the right.

09:13:29:15 - 09:13:53:16

Unknown

Yes. Right. Yes. Any of those words will work. Yes, yes, yes. And so on these particular days, do you know who sealed it in and shield it out? We have a record of employees who were in the area. Yes. Is there ever a time where somebody doesn't shield in or shield out? Process? They should, but I'm sure there is.

09:13:53:16 - 09:14:15:17

Unknown

And as I said, employees who work in the area every day don't shield in and shield out, but per process, if you're entering an area that's not your home work area, you should use the shield system or the documentation. The reason why I'm asking is we have seen throughout several interviews where some people don't shield out. They might go to lunch, they may go to the restroom, they may go on break.

09:14:15:19 - 09:14:43:09

Unknown

And so having that that's that's a process that doesn't exist. So a record that does not exist, is that something you've looked at or you're looking at also a safety issue. But yeah, if you it's a good question. We we track particularly the entering in so we know who's in the area. If you don't shield out, your manager actually gets a notification that this person didn't shield out.

09:14:43:09 - 09:15:06:09

Unknown

But that's several hours later. or at the end of shift, I've gotten notifications at the end of shift that someone didn't shield out of an area. You go back, you check, you try to fix the record. I don't know if we have an active improvement activity right now on working, particularly, as you mentioned, on the shield out the the wand out process or all of it.

09:15:06:12 - 09:15:27:17

Unknown

I don't know if we have an improvement activity on that. Okay. Thank you very much. And just one more, member Chapman had asked about the, recording the security video. have you changed the length of how long you keep that at all? I believe today it is still 30 days. Okay, great.

09:15:27:19 - 09:15:50:03

Unknown

Member Inman, just a quick question, and this is for often people who are not involved with this so much like we are, one thing that we've not mentioned is actually being able to interview the door crew manager. And so that person is on a medical leave. I think we've established that. Is that correct? That is correct. And so it's not for any reason that anybody's been withheld for that door crew manager know that.

09:15:50:08 - 09:16:13:15

Unknown

I think our investigators have verified that. That's right. And that manager is still on leave of absence. Really understand one of the questioning this may be about production itself and going back just a little bit, we talked about when the door plug was originally created and put in. It looks like at the start or sorry, not the door plug, but when an open hole for a door plug, it started with the max line itself.

09:16:13:17 - 09:16:37:12

Unknown

Has anyone ever ordered it with the emergency exit? to clarify your words with a working door? Yes, yes, yes, a lot a little. I don't believe it's most, but we have, airplanes in our line regularly that have the working door. Is that something? We have certain customers that order a lot of airplanes that haven't worked the door.

09:16:37:16 - 09:16:46:24

Unknown

Yeah. Spirit. Is that something that's also you reworking some of your procedures in regard to what we're seeing now?

09:16:46:26 - 09:17:16:10

Unknown

May have been a confusing question. So if I understand you correctly, the door plugs and all doors were part of an enhanced inspection process. that spirit began performing. And the reason I mentioned it during the earlier display with some of your representatives, they showed a graphic of a plane, and what was in blue was spirits. But the entry exit door, the main passenger door was not in blue and white.

09:17:16:10 - 09:17:51:09

Unknown

And I think we clarify that you also manufacture it. You just don't design it. So there's correct there's design responsibility for, the certain parts of the fuselage and the forward entry door is one that Boeing has the design responsibility for. The other passenger doors and access doors, spirit has design responsibility for if you have the design responsibility for the door plugs going back to Vaseline versus dishwasher.

09:17:51:09 - 09:18:21:20

Unknown

So are you responsible for that portion of the overall input or is it something Boeing is? I would have to follow up with our team to ensure that if that's something that that we, as part of a planning operation or part of a specification for what, lubricants are allowed to be used just in general. Okay. Target.

09:18:21:22 - 09:18:40:17

Unknown

But I just wanted to clarify two things. training for the door crew. in 2020, you mentioned Miss Lund. Foundational training. And on the job training in 2023. Was there recurrent training?

09:18:40:19 - 09:19:07:20

Unknown

Or is it all on the job after you do the foundational at that time? We have some level of recurrent training across the board. There are certain courses that are recurrent in terms of, door crew specific, but the majority of the training is on the job. I cannot answer with certainty right now whether there are certifications, if it takes a certification to do a job that is a recurrent training, I cannot I cannot answer that specifically.

09:19:08:19 - 09:19:33:01

Unknown

for our friends can, but I can't say I'm sorry. Thank you for that. And my last question is how do you prioritize work on flow days when there is rework? Is it constant reprioritizing how does that work? yes, that's part of the negotiation we do in in each of our flow days. We have, as I mentioned, sort of a critical path, a specific statement of work.

09:19:33:03 - 09:20:05:18

Unknown

Those are the ones that will be prioritized because they're the the airplanes that has a strong precedent network to the follow on jobs. So that will tend to be a priority. anything that, needs to be done in position, due to a product safety or personal safety issue will be prioritized in that position. For example, there are, some areas where it becomes very difficult to access the airplane once you move out of the structural tool to get on top of the airplane.

09:20:05:18 - 09:20:23:26

Unknown

So that we like to do in position, those would be the things that we would prioritize first. and those are the, the kinds of elements that will drive the elevation in that set system as well. If something really needs help because we need it done before, it needs to move to the next position, that would be an elevated issue in the set.

09:20:23:29 - 09:20:49:28

Unknown

So we prioritize it based on, critical jobs. critical flow of jobs, personal safety, product safety. Okay. Thank you. Member Brown has about seven questions that if it's okay with you, I'm we're going to the the investigative team will send them in writing. You can provide a written response may maybe within seven days. That sound reasonable?

09:20:49:28 - 09:21:16:08

Unknown

That sounds very reasonable. And then we'll put it publicly, in the docket for people to review that. All right. Happy to do that. Perfect. back to the technical panel in case you have some follow up questions. we're good right over here. Yeah. Great. No further questions to Marty's. Do you have any further questions for this panel?

09:21:17:06 - 09:21:52:18

Unknown

Alpa. No, ma'am. Alaska? No, ma'am. RFA not at this moment, Mr. Gerlach. Thank you. No, chair. Okay. And I am you. I just have a follow up on the discussion around isolation of the two of your crew. Did the company, evaluate and isolate any managers that failed to identify that a removal was to occur? the manager would have been evaluated.

09:21:52:20 - 09:22:20:08

Unknown

It would have been the the door crew manager who is out on medical leave. By definition, he was already not working on the airplane. So that evaluation process did not happen. We saw it in the set documentation. other managers that were engaged in the discussion about whether a removal was required. So there was other employees that were engaged in that or any of those investigated.

09:22:20:11 - 09:22:47:01

Unknown

I believe we, and I'm speaking for my colleague as, as I'm stating for a statement on behalf of Boeing. I believe they looked at the group of employees that, per the data, the collective set of data appeared to have been noted as involved in or asked to open the plug. It was that group of employees that were reviewed.

09:22:47:03 - 09:23:16:10

Unknown

Thank you. No further questions. Thank you very much. And spirit no further questions. Chair. So no further questions from the parties technical panels okay. Board of inquiry. All right. That concludes panel two and day one of this investigative hearing. So on behalf of the Board of Inquiry and the technical panel, I want to thank all the parties for their participation.

09:23:16:13 - 09:23:45:28

Unknown

I really want to thank, the witnesses. I know it was a very long day. We appreciate your patience, appreciate, your being forthright with your answers to your questions. and just as a final reminder, we ask that all witnesses be present for the entire hearing again both days. So please be here back in the boardroom. unless you've coordinated advance, with the hearing officer, you may be recalled.

09:23:47:07 - 09:24:20:10

Unknown

I don't believe we have any new exhibits. Correct. All right. The transcripts are scheduled to be available within seven days of the completion of the hearing. As a safety agency, we, certainly, take, fatigue very, very seriously. So just a reminder for the Board of inquiry, to refrain from contacting NTSB staff after we leave here today so that they can get some sleep and rest and be prepared for tomorrow.

09:24:20:16 - 09:26:29:22

Unknown

But if you have additional, questions or need assistance, Tim Lebaron, Dana Schultz, Dave Hilson and Brian Curtis are available to help you. to the technical team. You did an excellent job. Thank you. I hope you do get home. Get home tonight and get some rest. we stand adjourned until 9 a.m. tomorrow.