NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

October 25, 2011

Maintenance Personnel Interview Summaries

1.0 **Interview:** Aaron David Yates, Mechanic, Atlantic Southeast Airlines (ASA)
Date: September 7, 2011
Location: Phone interview
Time: 1015 EDT
Represented by: Juan Ruiz, Teamsters
Present for the interview: Katherine Wilson (phone), Timothy LeBaron, Michael Hauf (phone), and Maryam Allahyar (phone) – National Transportation Safety Board; TR Proven – Federal Aviation Administration; Otto Dietrich (phone) – Bombardier; Brad Sheehan – ASA

In the interview, Mr. Yates stated the following:

He had been an aircraft mechanic with ASA for 3 years. He had not held any other positions with ASA and had not worked for any other airlines. He held an Airframe & Powerplant (A&P) license. His responsibilities as a mechanic were to repair and maintain aircraft in the ASA inventory.

Mr. Yates described his shift on Wednesday, August 31, 2011. He clocked in at work about 30 minutes before a meeting started. He found out who the lead was and was assigned to an airplane. The airplane needed to be brought in and jacked up and set operations on the airplane undertaken. He checked to see if the airplane was there and it was. The bay they wanted to put the airplane in was not available so he asked to put the airplane in another bay because the task he needed to do was time consuming. When the airplane got in to a bay, he jacked it up and removed the left wheel bin. He was not sure of the next thing to do so he asked the inspector who told him to remove the right wheel bin. He next got the pins to lock out the auxiliary emergency let down cable. Once that was completed he started to remove the uplock device starting off with the lines on top going to the uplock top bolt, then the cable, then the bottom bolt and put it away. He clarified that before he jacked up the airplane, he put in the lock out tag out kits for removal of the uplock device. He got the part number and serial number for the tag for section D. He checked the paperwork to make sure he had the correct airplane. He installed the bottom portion of the uplock then attached the emergency letdown cable to the uplock then pushed the uplock in to position. He then installed the bolt. He said he inspected it the best he could but did not see the

bolt. He continued on and attached the hydraulic lines. When he did that, he called the inspector to make sure he did it right. He also asked the inspector if he installed it right. Neither one of them saw anything wrong with the installation. He had the inspector around and started torquing the bolts and lines and installed the proximity sensor on the uplock. He took the measurement from the task card for the limits and what it was supposed to have been. He hooked up the power to the airplane to commence operation of the landing gear. He said they operated the gear 11 times including the emergency letdown. There were no malfunctions or hang up; "nothing whatsoever." He then installed the wheel bins and wheel bin overheat sensor. He did an ops check after the airplane was jacked down. After that it was about time to go home. He said that was the end of what he accomplished on 875.

Mr. Yates was in the hanger at 830 PM and the meeting started at 9 PM on Wednesday night. He worked until 730 AM. He only replaced the left uplock and guessed that it took about 7-8 hours. He had never replaced an uplock before and had not received any training on installing one. He rated the difficulty of the uplock removal and installation at about a 3-5 on a scale of 1 to 10. He had the task card and maintenance manual as references. He said he referenced the maintenance manual during the task. He had never observed an uplock being installed incorrectly. He used a headlight during the task but did not use a mirror, which was in his tool box.

The uplock installation was an RII (required inspection item). Asked if he was supervised during the task, he said the inspector came by quite often. No one assisted him with the task.

He was not aware of any engineering orders related to the uplock assembly.

He said he followed the task card and it required initials from the mechanic and inspector.

He did not know of any difficulties during the installation. He said the hydraulic lines were "kind of a problem" in that they "don't like to fit". He said this was a common occurrence with hydraulic lines.

He did not have any concerns about completing the task.

Mr. Yates participated in the functional checks. He said there were no problems. During the checks, he was located in front of the airplane and off to the left. He said the inspector also participated in the checks and was positioned at different areas, sometimes beside him or at the left wheel well to make sure the sensor was correct in its adjustment. The inspector was inspecting the installation as they operated it. Carlos Cruz, the lead, was in the cockpit and he did not report any problems.

During the checks, the airplane had no problems.

Mr. Yates did not have any other tasks during his shift.

During his shift, he had a break from 1115-1130 PM, ate lunch at 1-130 AM, and had another break from 415-430 AM. He said there were no work stop procedures to follow when he

took a break. He would just remember where he was. He said he was not gone long enough to forget so when he was done with his break he would just pick up where he left off. He was the only person working on the task so there was no way to mix it up with someone else.

He carried a notepad with him and used it to write down the airplane numbers and what he had to do on them. He had no problems remembering what he had to do.

He said the lead decided how tasks would be divided among the mechanics; mechanics had no say.

He was not sure how many mechanics were on duty that night. He thought there were 2 lead combined crews. He said the lead assigned to his airplane ended up taking the other airplane and that lead took his airplane. He did not know how many inspectors were on duty but thought less than 10.

He said the workload varied from night to night; it was sometimes heavy and sometimes modest. During the Wednesday night shift, it was pretty heavy; there was a lot of work.

He had worked with the RII inspector a lot of times. He did not have any concerns about the inspector and said he did not cut any corners.

Mr. Yates was not aware of a previous incident involving an Air Wisconsin CRJ with an uplock problem.

Since the incident on Thursday, September 1, 2011, he had only heard rumors about the incident until Tuesday, September 6 when he was told the airplane belly landed because the top bolt of the uplock was not installed correctly.

When he installed the top bolt of the uplock, he said he used the spacer.

Mr. Yates was asked about his activities in the 72 hours prior to the event shift. On Sunday, August 28, 2011, he was not working. He went to bed about 8 AM on Monday morning. He said his schedule did not change and he worked nights. He would go to bed about 8 AM and sleep until 430 PM. He did this on his work days and off days. When he was not working and was up at night, he would watch TV, use his video game system, or get on the computer. He would also help take care of one of his children. He said his body did not like to revert very well to sleeping at night. He had been working nights for 3 years.

His days off were Friday, Saturday and Sunday. He worked Monday through Thursday nights. He did not have any problems at work on Monday or Tuesday and did not work any overtime.

He said he sometimes fell asleep easily, normally within an hour. He did not have any problems sleeping on Monday or Tuesday. On Wednesday, he had problems staying asleep. He

did not know when he woke up but said he got out of bed at 430 PM and was as rested as he could have been.

He did not nap before his shift on Wednesday night.

He said it had “been awhile” since he had taken a vacation.

He did not feel tired on Wednesday night until the job was done because he had really worked and that made him tired.

He said his sleep schedule is just what he had to do. He blacked out the windows in his room. He had not had any training on how to sleep during the day. He did what he did because it was the only way he would get to sleep.

He did not eat during his breaks on Wednesday night but had leftovers for lunch.

He did not work any other jobs outside of ASA.

The tasks he did during his shift changed every night. He said Monday and Tuesdays were pretty light, Wednesday was heavy, Thursday was heavier and Friday was the heaviest when he had worked that before.

Mr. Yates did not normally work overtime.

He said the biggest challenge of his job was “all of it”. The most satisfying part of his job was starting a job and being able to finish it by the end of the night. He said he could usually finish a job during his shift unless issues suddenly arose that could not be fixed.

There was sometimes pressure to finish a job. ASA has the thing about time and they would ask him when he would be done with a task. He did not feel any pressure on the Wednesday night event shift.

He did not know what he would change about his job.

He had been previously disciplined for his performance when he was putting in a main cabin door sensor. When the procedure required avionics to be wired he asked for avionics to complete the task. He was told he should be able to do the wiring himself. Documentation of this was temporarily kept in his file but it was removed after a few months. He had never done wiring before and had not done wiring since that event. He had not received any commendations for his performance and had not been involved in any previous incidents or accidents.

He had not had any major changes to his health or financial situation in the last 12 months. Regarding to changes to his personal life, he had a child born 6 weeks ago.

He said his health was normal and did not have any sleep disorders. He said his vision was “fine” but he wore glasses to read. He had no issues with color vision. He did not have any

hearing problems. He did not take any prescription medication. He had an occasional alcoholic beverage and ASA's policy was 8 hours "bottle to throttle". He did not use tobacco products or illicit drugs. In the 72 hours before the event shift, he did not take any medications, prescription or nonprescription that might have affected his performance. He took Advil during his shift on Wednesday because he got headaches but it did not affect his performance. He was not tested for drugs or alcohol after the incident occurred.

Mr. Yates received on the job training when initially hired. He received recurrent training on engine runs and paperwork for maintenance releases to be able to sign off aircraft. He thought the training he received was adequate for his job. He had never heard of maintenance resource management and said he did not receive human factors training.

There were no consequences of delaying a flight for maintenance except for telling mechanics to hurry up.

As far as procedure, the way to inspect and check some of the problems, could have been done a little better to see if the uplock was locked in place. He thought there needed to be a better visual way. He did not recall the procedure mentioning to use a mirror.

Because Mr. Yates had never done this task before, he was asked how he approached task. He first looked which circuit breaker needed to be pulled. He said the lock out tag out kit was already out. He said he did the best he could. He read a little bit ahead in the procedure and then if he had any problems, would check it as he saw fit.

He said it varied on the night as to whether he was assigned a task he had never done before. It was "a very good possibility" that he could be assigned something he had never done before.

Asked if he needed help on a task if there was a friend he could ask, he said yes.

To verify that the upper bolt went through the uplock, he looked over the top of it. He did not see the bolt; if it was up against the uplock, he said you should be able to see the bolt from the top. He did not see anything. He did not look up from the bottom.

He thought there needed to be a way to see the bolts and suggested cutting a space in the uplock so that the bolt could be seen. He did not think installing the upper bolt first was right because of the hydraulic lines on top and if they were adjusted too much they could fail.

He torqued the bolts after he moved the assembly was in position and then had the inspector come and look at it. He did not torque the bottom bolt first; he torqued them all at the same time. He said if he torqued the bottom one, it would not move normally.

He thought initial training was a week.

He only worked on the CRJ.

He did not recall if he pulled down on the assembly. He did not recall if the inspector used a mirror.

He said the lead and the RII inspector were different people.

He got his A&P from AIM in Lawrenceville.

He did not have any military experience.

Regarding the main cabin door sensor issue discussed previously, he said he had never been asked to do that again. He said he was not comfortable with wiring. He had an A&P but they did not show him those things.

He did not mind calling UNCLE. If he thought he was out of his league, he would call someone. He said he was hesitant on who he would ask for help from.

The leak check was done as soon as he had it torqued down and called the inspector. They turned on the hydraulics and there were no leaks. When they installed the wheel bin, they looked at it as well. There was no leak.

He confirmed that they did 11 gear swings. He did not remember how many were powered and how many were not powered/emergency let downs.

Regarding whether they let the landing gear settle during the checks, he said when they brought the gear up, they waited until it was up and locked, waited a minute and then dropped it back down. The manual release was done from the cockpit; they pulled the emergency let down from the cockpit.

He did not recall doing the shake test.

He thought the problem with adding a warning or caution to the task card was that there were so many notes and so many cautions they can be real easy to miss.

He did not ask anyone for help other than the inspector.

Mr. Yates was asked about his difficulty rating of 3-5. He said the task was interesting and said “I guess you could call it a challenge.” He said at that time he enjoyed it because he enjoyed a challenge.

2.0 **Interview:** Rene Metcalf, Inspector, Atlantic Southeast Airlines (ASA)
Date: September 7, 2011
Location: ASA facility, Atlanta, Georgia; Phone interview
Time: 1140 EDT
Represented by: Juan Ruiz, Teamsters
Present for the interview: Katherine Wilson (phone), Timothy LeBaron, Michael Hauf (phone), and Maryam Allahyar (phone) – National Transportation Safety Board; TR Proven – Federal Aviation Administration; Otto Dietrich (phone) – Bombardier; Brad Sheehan – ASA

In the interview, Mr. Metcalf stated the following:

He was an inspector for ASA since 2008 and worked the night shift. Prior to that, he was a mechanic in C check in Macon for 3 years. He went from Macon to Atlanta to the line for 1.5 years. He came to the hanger as a lead mechanic and was in that position until 2008 when he joined the quality department until now. He was hired by ASA on June 7, 2004.

His duties and responsibilities as an inspector included inspecting the aircraft assigned to him, inspecting the paperwork, inspecting the work package assigned to the aircraft, and making sure it was in compliance with maintenance programs and maintenance releases.

He received training when he became an inspector. He said he had to be Cat II and RVSM qualified and aware of faulty parts, false parts, RII items, and SOPs.

He held an A&P certificate since 1991 or 1992. He had worked as a mechanic before joining ASA and said he had been "in the business" since 1982. He started in Daytona Beach Aviation and worked as a ramp supervisor and an airport operations supervisor. He was in charge of FBO, fueling, fuel farms, personnel, and the Embry Riddle ramp, fueling and operations. He joined Eastern Airlines in Atlanta in 1985. Then he worked for Aerospec in Peachtree City doing general aviation work, and also C checks for ACA, ASA, Continental, and TWA on a number of aircraft. He worked for Aerospec for 7 years. In 1997, he joined Northwest in heavy maintenance checks in Minneapolis before returning to Atlanta and joining the heavy maintenance programs there. After that he did contracting work for Mobile Aerospace and then joined ASA in 2004.

Mr. Metcalf was asked to describe the shift in which the incident occurred. He worked the night shift and normally showed up around 8:30. He got upgrades and updates on the work scope for that night. His lead printed the list and said he was assigned to two aircraft. One aircraft was 875 and he got a work order with a package. The other aircraft was 759 which had an APU problem and a "drop dead" item that needed to be looked at. He first went to aircraft 875 which was in a hanger. He did a walk around of the 875 because it was a scheduled airplane; on the outside he would look for obvious defects that need attention. He found some problems with the wheel bins in that there were fasteners missing or damaged. He told the lead that the wheel bins needed to come out and be sent to sheet metal for repair. The wheel bins needed to come out anyway because one of the tasks was to change the left main landing gear uplock. He discussed the work package with the lead and told him to confirm the paperwork. Mr. Metcalf wrote the

part number on his sheet and wrote the task card they were going to be working with. He told the lead to call him back with the airplane was on jacks so he could a preliminary inspection. He went to look at the other aircraft and then came back to 875 which was on jacks. They discussed the work package again and the mechanic was to remove the left main landing gear uplock. He told them that when it was removed, he wanted to inspect the box to make sure there was no damage, corrosion or other discrepancy with the box. He went back to look at his other aircraft. The mechanic called him back when the box was removed and he inspected the attachments points for the main landing gear uplock which were very dirty. Mr. Metcalf asked for the part to be cleaned so that he could further inspect it for any evidence of corrosion or damage. He was shown the hardware which was dingy and told them he wanted it changed. The lead was advised and ordered the hardware. He told the mechanic that once he was ready to install the bottom bolt his concern was the hookup of the emergency release cable. He was adamant that he wanted to see the clevis and safety pin installed before the box was pushed in because it was the easiest way to look at it. He was called back and saw the clevis, safety pin and bottom bolt properly installed. He told the mechanic he could push the box in. Mr. Metcalf said he did it this way because it was the preferred way for an inspector to look at it because everything was exposed. Once the box was pushed in, he said it was very difficult to look at that clevis. He came back to see the final installation of the main landing gear uplock and the torques were performed and the cotter pins were ready to be installed. Then he left the mechanic to install the safety pins.

He went back to the other airplane. He got a call from the lead that he was ready to swing the gear but Mr. Metcalf told him “no you are not”; first they needed to do a leak check. He went in to the wheel well and did a leak check of the unit. He made sure that both hydraulic lines were properly attached and yanked on them to make sure that they were properly secured and that the lines were at the right angle for clearance. No leaks were noticed at that time and he told the lead they were ready for swings.

He said the task card tells them to do the swings but the manual tells them that they need a minimum of 5 cycles. He told the lead they were going to do 5 normal cycles which they did. They did 5 swings with no indication of any anomalies on the sensors or the timing. He timed the gear at 22 seconds to deploy, some were 21 and some were 23 seconds, which he said was a normal extension. When he was satisfied with the swings, he told the lead they were ready for the emergency gear extension. The lead printed the paperwork because the lead would be in the cockpit and Mr. Metcalf would wait outside. He was in radio communication with the lead at all times and he asked the lead to inform him when they got three green lights. He said the main landing gear was not easy to deploy without wind so he instructed the mechanic to help the main gear until they got three greens which they did. At that time, he went inside the cockpit because he wanted to see on the EICAS the gear disagree confirming the position of the gear and the position of the handle. He also wanted to see the complete extension of the alternate gear; he saw it. He then instructed the lead to reset the alternate gear extension handle down and he put his fingers on the handle when it was fully stowed. He then instructed the lead to put the handle down so they could see the gear disagree warning disappear. All indications were fine. He instructed that they do three more gear swings under normal conditions and they got normal indications. He did a final leak check; he wiped the uplock and checked the hydraulic lines. All was fine. He gave the okay to install he microswitch which he then inspected and then gave the okay to install the wheel bins when they came from the shop. He was satisfied with the complete

process at that point. The wheel bins were installed and the airplane was down jacked and put outside the hanger. He stated that he got off from duty about 7:40-7:45 AM. The length of time required for replacing the uplock including the lunch and the breaks he guess was about 5 hours.

He was familiar with replacing an uplock on the CRJ and said it was his “bread and butter” when he was in Macon. He said it was a dirty job that no one wanted and the “newbies” did it. He had replaced the “old” uplock at least 20 times but had never replaced the “new” uplock that was on the incident airplane. The difference between the old and new uplocks was that the new one was less cumbersome and friendlier; it was also smaller. He said the old one was more complicated. He had inspected an uplock before several times. He believed the process of replacing a new uplock was not difficult, but was time consuming. He said it was a “simple process”.

He did not receive training for inspecting an uplock. Except for the rigging of the cable release and people forgetting to put the rigging pins in or getting ahead of themselves and not setting up for the removal, he had not seen any problems when inspecting an uplock.

He did not observe any problems with the uplock installation on the incident airplane. When inspecting an uplock, he liked to remove the rigging pin in the center quadrant and yank on the wire to make sure the springs and tabs were moving, which would tell him the system was hooked up properly. He also liked to push on the hook to make sure that it moved properly, there were no leaks and that the routing was correct. He did this on the uplock that was removed and also on the right main landing gear uplock to make sure that it was fine. He used a flashlight and a mirror during the inspection. He said he used the mirror to check head of the upper bolt on the inboard or forward side. He also checked on the washers, cotter pin, and he did a general check. Asked if he could see whether the upper bolt engaged the uplock assembly, he said he could not see inside the box but wanted to make sure the washers were installed on both sides. Once the box was in there, it was difficult to see the bolt going through. He thought the task card said to check the bolt and said in this case he did not see anything out of place or any irregularity. He said he did not inspect the bolt after the 11 gear ups and said his general inspection was to see the wire, the emergency release, the springs actuating, that there were no leaks, and the outside of the box on both sides. He also put his hand on the hydraulic line to make sure the nuts were tight.

Mr. Metcalf was the only inspector checking the incident aircraft. He used reference materials regarding the gear swings; he wanted the proper circuit breakers pulled, especially for the alternate gear station. He was insistent on that because there was sequence to be followed, especially for the deploy and stowing, so he had the lead print the task cards for that. The task card required his initials on all pages.

During the gear swings, he was located in front of the nose of the aircraft. Once they did the second gear swing, with the gear up, he checked the gap of the proximity switch. He checked the gap using a mirror. When he was satisfied that the gap was good, he asked them to release the gear while he was standing between the main landing gear. He remained there for the next three swings. When he was satisfied that the doors were feathering fine and the gap for the micro-switch was fine, he asked the lead if he got any gear disagreements on the EICAS. The lead told him that everything was fine.

He took his lunch about 1:00-1:30 AM. He thought the mechanics had a break at 11:30 PM and 4:30 AM. Inspectors sometimes took breaks but he had two aircraft so when the mechanics were on their breaks he took that time to check on aircraft 759. There were no work stop procedures when taking a break or going to lunch. He would normally take notes in his case and would ask the mechanics where they were at that time.

He thought the workload during the incident shift was heavy. The maintenance on the incident airplane was “quite a load”. He said it was typical to have that kind of maintenance and only one inspector assigned.

He had worked with Mr. Yates and had known him since he worked in Macon. He said Mr. Yates was the type of mechanic where if he was unsure of something he would ask questions, which Mr. Metcalf liked. He said not all of the mechanics liked to do that because they did not want to look like they did not know something. He did not have any concerns about him as a mechanic except that sometimes he was not sure of himself, but Mr. Metcalf that it was maybe because he was “too new”. He thought for a systems mechanic to be confident, he would need at least 5 years experience and they could work any system without a problem; he thought it would be at least 48 months before a mechanic would be familiar with all of the systems.

He did not know that it was Mr. Yates’ first time replacing an uplock. Mr. Metcalf would have been concerned if he had known this. He would have stayed closer. He said Mr. Yates asked him to explain which way he wanted to do the inspection. He told him his main concern when he installed it was to see the rocking of the cable for the emergency release. He told him to pay attention to that. He also told him to make sure the rigging pins were on; Mr. Metcalf checked that. He told him to be sure that when he installed the hardware to make sure that he installed it the right way; he said Mr. Yates did pay attention to that. Mr. Yates made sure that the routing on the pulleys from the center quadrant, that the rigging pins were there; Mr. Metcalf did double check that. He was aware of mechanics forgetting to put the rigging pins in.

He was not familiar with the Air Wisconsin incident involving a misinstalled uplock. He was informed of it after this incident. He was briefed on the cause of this incident on Monday, September 5th. He was told the upper bolt did not go through the box.

When doing the gear swings, he stated he timed the gear to its complete stop and did this several times. He did this for the nose and the main landing gear. Once he was satisfied, he asked for the gear to be retracted. He said there was no doubt when the gear was hitting the stops at its full extension. It would shake the airplane and he did not like to swing the gear when the wings were still shaking.

Mr. Metcalf was asked about his activities in the 72 hours before the incident shift. He was not working on Sunday, August 28, 2011. When he had the day off, he would go to bed anytime he was tired. He did not recall that time on Sunday night and said he spent the evening with his family. He had to work Monday night so thought he napped from about 2:00-5:30 PM. After working an overnight shift, he would get home about 9:00 AM, have breakfast, watch the news and then be in bed by 10:30 AM. He would wake up about 5:30 PM and begin his next

shift at 8:30 PM. He felt rested for his shift on Wednesday, August 31. He said he had back problems but he slept good.

He worked overtime on the Friday and Saturday night shifts prior to the incident shift. He had worked the night shift about 5 years.

He said he had a special room that was “all darkened up”; it was the guest room on the other side of the house which he used for resting during the day. He had not received any training on how to adjust to working the night shift.

He had never been disciplined for his performance. When he did general aviation contract work, he got a commendation for getting an aircraft out before the time it was scheduled. He had not been involved in any previous incidents or accidents.

He had not had any changes to his health or personal life, good or bad, in the last 12 months. He had a change to his financial situation about 4 months earlier, but it was resolved now.

He said his health was good but he did have acid reflux. Sleeping was sometimes difficult because of back problems but he did not have any sleep disorders. He used reading glasses and thought he was wearing them on the incident shift. He had no problems with color vision. He said his hearing was very good. He took ibuprofen for migraines about once every three months. He thought the last time he took the medicine was 3-4 months ago. He did not drink alcohol, use tobacco products or use illicit drugs. In the 72 hours prior to the incident shift, he took Zantac for his acid reflux but no other drugs, prescription or nonprescription, that might have affected his performance. He did not have any side effects from taking Zantac and he took it once a day. He was not tested for drugs or alcohol after the incident occurred.

Regarding training on RII items, he was told on what was an RII and what was not. He said a new inspector would get on the job training for a couple of nights. He said there were certain things that they need to know before you were on the floor – which were the affected areas, pitot tubes, where the RVSM areas were, and what to look for during the airplane walk-around. He thought the training was adequate for him to do his job as an inspector. Asked if he received training on maintenance resource management, he said that they got self advice from senior inspectors who tell you what to inspect, how to react when a mechanic gets angry with you because you are requesting something from him that he is refusing or resisting to perform. They also talked about things about how to handle a situation. He said it was “sort of in house training in inspection; don’t get in an argument, diffuse a situation”; “a little bit of human relations”. He said he got a human factors class, he thought when he joined the department.

He received recurrent training every year for maintenance releases, RVSM, Cat II, and other items that needed to be checked every year.

Asked if he felt any pressure from ASA to get airplanes out on time, he said the pressure was always there; they had deadlines and airplanes to put at the gate. It was not going to change and it was not only at ASA but everywhere he worked. He said if he let it control what he was

going to release, that was a problem and he did not let that happen. If he was not satisfied, the airplane was going to stay. There were no consequences for delaying a flight for maintenance. He did not feel any pressure during the incident shift. He said they took their time doing it and swung the gear until he was satisfied that it was good and there were no indications of any anomalies.

When asked about whether there was anything he could think of which could have helped him catch the mistake that was made, he said that had been bothering him a lot. He said something needed to be included to check the box in a different way. It was going to have to be amended because the mechanic missed the hole and then they followed the steps in the maintenance manual and everything passed except the bolt was not in place. That was a problem for him. There needed to be something to double check the box in a different way. He said if that was missed, they could not afford that. He did not know how it slipped through. He said he yanked on the hydraulic lines and it was “solid” and “firm to the feel”, no swiveling or rocking.

He did not know that a bolt had been missed before when installing an uplock. When he would install an uplock previous, he would fill the spacer with grease and then he could see the grease coming out the other side and there was no doubt that he was pushing the bolt through and knew the bolt was in place and going through the box. He said once the box was pushed in, it was difficult to see it.

There was no inspection procedure, just the steps on the task card. He thought there should be a box for the RII that he could mark on the task card to indicate it was done like they had for the landing gear.

Mr. Metcalf confirmed that a Cat II was an instrument low approach. He also clarified that the hardware changed was all the bolts that go to the box and the box was the uplock itself. He clarified that the right wheel bin was removed because he saw damage to the cam screws.

Regarding whether he left the gear settle during the swings, he said the gear was up for a long time because he had to get in to the wheel well and use his mirror and flashlight to look at the proximity switch gap on the uplock. That took him “several minutes”.

He was using the Bombardier task card from the AMM. He signed each page at one time but not a particular line item, which was what he would want to see.

He said there was only a partial view from the aft side to check the upper bolt. He used a 2.5 inch mirror but there was not enough clearance for that. From the top, it was not an easy thing to look at. He said you could see the spacer from the top. He said he grabbed it from the hydraulic lines and it was “solid”. He only did “the shake” on the hydraulic lines. This was done after the bolts had been torqued. Asked if it was a proper statement that an assumption had to be made that the mechanic had done the task properly, Mr. Metcalf said yes it would.

For the alternate release, he said the handle was against the stop. On the final stowing, when he stowed the handle, he made sure the button was sliding good. He slid it all the way against the center console.