

Pilot Flying (PF/PIC)

Q1: How was your health and fatigue level on the day of the flight?

A1: There were no issues with my health, and I was not in a state of accumulated fatigue.

Q2: How was your recent sleep situation?

A2: I went to bed early the previous day, so I felt I had sufficient sleep. I slept for about 6.5 hours.

Q3: What was your past experience flying with the other crew members on this flight?

A3: It was my first time flying with the COP (Copilot) acting as PM. I had flown with the CAPM once before his promotion.

Q4: How is the relationship and mutual impression between the crew members?

A4: I have known CAPM since he just became captain, COP is part of the APP committee and I am part of the secretariat department there, and we have been working together for more than a couple of years, so I know him well enough to know his personality.

Q5: Were there any special remarks during the flight plan verification?

A5: There were no special remarks.

Q6: Were there any special remarks regarding the aircraft condition?

A6: None in particular. During the approach briefing, I stated that there were no issues with the technical status.

Q7: Were there any special remarks regarding passenger information?

A7: The Cabin Attendant mentioned a demanding passenger in seat 1A, but it had no specific impact on the operation.

Q8: Were there any factors hindering on-time performance?

A8: Door closure was delayed at departure, resulting in an actual delay of about 15 minutes. This NH114 flight is delayed about 80% of the time based on monthly data and has very little buffer in block time. We discussed the possibility of a delay even if we departed on time. Despite the late departure, we saved considerable time through shortcuts in the air and arrived at 22:53 UTC, which I believe was a good recovery.

Q9: Could you describe the events of this flight in chronological order as you remember them?

A9: Typical winter early morning fog was forecast for Houston, and we discussed that weather would likely be poor upon arrival. While checking NOTAMs, I was highly conscious of RVR availability and which runways supported CAT II or CAT III. Originally, an easterly wind was forecast, but due to weak surface winds, it was a westerly operation, and we proceeded with the intent to perform a CAT III approach. During the flight, weather deteriorated to 1/4 mile (400m) with Vertical Visibility at 100ft, making CAT II difficult, so we proceeded based on CAT III. During the approach, RVR was reported, but never below 1000ft. The minimum is 600ft, but since no three-digit RVR was reported, we approached feeling a CAT III landing was feasible. We received radar vectors and entered normally without severe speed restrictions. If anything, there was an easterly wind aloft while the reported surface wind was northerly; eventually, we landed with an easterly wind. We discussed a "headwind shear," and at that time, I manually overrode the thrust to maintain speed. There was no significant speed change until around approaching minimums. Because the ground speed (GS) was about 160kts during Autoland, the 50-40-30 auto-callouts were at shorter intervals than usual, and "Flare" and "Idle" occurred almost simultaneously. The B787 has a HUD, making the scan pattern complex; unlike the B777, it's not an aircraft where you shift your gaze upward upon touchdown. I confirmed full idle, and just as I moved to raise the reversers when the speed brakes deployed upon touchdown, the nose rose unexpectedly, which surprised me. When I shifted my eyes to the PFD, the pitch had already reached 7.5 degrees (maximum 7.8). Autothrottle was not engaged and reversers were up, so I hesitated for a moment, but assuming autobrakes and reverse thrust were effective, I pushed the column myself. Since the wind was not strong, there was no lateral drift, and I performed the rollout manually. Just before exiting the planned high-speed taxiway, the TAILSTRIKE EICAS message appeared. None of the three crew members were sure if we had actually struck the tail. We decided not to report to ATC at that point and proceeded to block-in.

Q10: Does this mean the approach turbulence itself was not that bad?

A10: Aside from the headwind shear when the easterly wind decreased, the air was not turbulent.

Q11: You mentioned visibility was around 1000ft; was it a situation where you couldn't see anything?

A11: Yes, at a Radio Altitude (RA) of about 130ft, CAT II would have been very tight; it was a situation where you couldn't see unless you descended right into it.

Q12: How did the FMA (Flight Mode Annunciator) change after touchdown?

A12: There were "FLARE" and "IDLE" callouts. After touchdown, while raising the reversers and looking outside, I noticed it had switched to TOGA via the COP's callout. I then checked the PFD and confirmed "Blank / TOGA / TOGA".

Q13: What was your scan pattern from short final until decelerating to taxi speed?

A13: Due to poor visibility, my main focus was constantly on the HUD. I confirmed FLARE/IDLE on the HUD, and after those calls, I shifted my gaze slightly upward, looking almost straight ahead until touchdown. At that moment, the FMA in the HUD did not enter my field of vision. Reversers are operated the instant of touchdown.

Q14: How did the unexpected rise of the nose appear to you?

A14: I was looking outside through the HUD and could see it rising. Despite poor visibility, I felt the pitch up by seeing the boundary between the fog and the ground moving downward.

Q15: What did you see in your peripheral vision?

A15: My peripheral vision caught the speed brakes.

Q16: Regarding your hand movement during reverse operation, some people approach from the front and others from the side. How was yours?

A16: From the front.

Q17: Did you have any sensation of your fingers touching anything at that time?

A17: The three of us discussed the possibility of having touched it somewhere. My hand is placed on the REVERSE THRUST LEVERS upon touchdown after reaching idle. I have no conscious awareness or sensation of my fingers touching a switch during that interval. I don't know if I touched it while moving my hand. In all my years of operation across various aircraft types, I have never accidentally hit it.

Q18: Did you feel your hand take a different path than usual during the sequence of operations?

A18: No, none. It was as usual.

Q19: Was your grip on the thrust levers normal?

A19: Yes. It was the specified grip, and I did not change it afterward.

Q20: Please describe the state where you visually felt the pitch rose more than usual.

A20: I was looking outside through the HUD. While I couldn't tell the exact degrees on the HUD, when I was told "It's in TOGA" and looked down at the PFD, it was 7.5 degrees (max 7.8).

Q21: You would have been touching the control wheel with your left hand during landing; could you sense the pitch-up from the feel of the control wheel?

A21: Not really. I am pulling during the flare, but I'm not sure how much I was pulling at touchdown. Since I wasn't gripping it firmly, I couldn't sense any abnormality in the pitch-up from the wheel's feedback.

Q22: In a normal flight, do you have a set sequence or sensation for operating the reverse levers after the main gear touches down?

A22: I act based on the sensation of touchdown, but I strictly ensure that I visually confirm the speed brakes are deployed before operating the reversers. In the past, during training, I once pulled the reversers before the speed brakes deployed, so I make sure not to do that.

Q23: How were the PM's callouts?

A23: FLARE and IDLE were normal. He immediately called out when it switched to TOGA without entering ROLLOUT (I think he said it right as the nose was rising), and I felt no discrepancy in the timing or number of seconds.

Q24: Did you recognize the tail contact through impact or the message?

A24: There was absolutely no impact or vibration. The landing itself was extremely smooth, and the message appeared only after entering the taxiway (just before exiting the high-speed taxiway). It didn't appear on the runway. When I asked the CA later, they said there might have been a "roaring" sound, but they couldn't tell from vibration.

Q25: Did you think you might have struck it when you saw the message?

A25: We talked about how the pitch had reached 7.5 degrees, and given the weight was 400,000 lbs, I thought there was a possibility of a strike at 7.5 degrees. When the message appeared, I thought, "Maybe we really did strike it."

Q26: When you disengaged the autopilot, did you use the switch on the control wheel?

A26: No, thinking "this is bad," I forcefully pushed the column forward with both hands to disengage the autopilot. Since pushing the Autopilot Disconnect switch while pushing the column would cause me to lose pushing force, I disengaged it by the force of the push itself. Afterward, I pulled the column significantly to prevent the nose gear from slamming down. (To prevent the Nose Gear from being slammed, after the A/P was disconnected by the pushing force, a large pull operation on the Control Wheel was performed.)

Q27: Did you perform the Non-Normal Checklist after vacating the runway?

A27: Yes, that is correct.

Q28: What was the interaction with ATC?

A28: We vacated with a left turn and took the first parallel taxiway NA with a left turn. I believe we were told "Hold short of NK." After passing before NK TWY, we were instructed to contact Ramp. When instructed to enter the apron via Spot 18 or 19, specifically Spot 19, we were told to contact Ground again.

Q29: How did you report the situation to the local mechanics after block-in?

A29: I told the local foreign mechanic that the "TAILSTRIKE" message had appeared. The mechanic surprisingly calmly said "Understood," and that was it. I did not report detailed history such as the pitch at touchdown to the mechanic.

Q30: How did you record it in the journey log?

A30: I only recorded the phenomenon. I wrote that the tailstrike message appeared and the fact that it was a CAT III Autoland.

Q31: If a part of your hand potentially touched the TOGA switch, which part do you think it might have been?

A31: I've thought about it many times, but the other two said they didn't press it, and I have no sensation of touching it myself. Since I was able to pull the reversers immediately from idle, I wonder if it's even possible to touch it in between. I have no specific sensation that "this part" might have touched it.

Q32: Assuming the TOGA switch was touched, do you have any ideas on how to prevent recurrence?

A32: I believe it would be effective to keep holding the thrust levers without releasing them from idle until completely touched down (not releasing hands until touchdown). Apparently, some people release them occasionally, but if you keep holding them until touchdown, I don't think it would enter (TOGA).

Q33: What are your thoughts on this incident?

A33: I still don't know the reason why it ultimately entered TOGA mode, but my reflection is whether I could have prevented the situation where the pitch rose above 7.5 degrees. Even if the pitch isn't clear on the HUD, if I had seen it rising on the PFD—since it touched down at 3.6 or 3.8 degrees and rising more than 5 degrees from there is abnormal—my primary thought is that I wish I could have disengaged (the autopilot) myself. Logically, the fact that the speed brakes deployed means the ground mode was sensed; if so, the switch must have been pressed before that, but it didn't result in the logic where thrust increases and power is suppressed. I don't quite understand that part, but my regret is that I couldn't immediately suppress the rising pitch to prevent tail contact. However, I wasn't prepared for it, and there is an idea that manually disengaging the autopilot during Autoland (especially during CAT III) is not good. Since I held that value, I couldn't disengage it immediately (there was hesitation).

Q34: Did you inform ATC that "we might have struck the tail" at the timing of block-in?

A34: The three of us discussed that we should report it once the strike was confirmed, and finally, after block-in, the maintenance confirmed it. Since the operations manager was to report from the company to the airport authority, we did not report directly to ATC ourselves.

Q35: You mentioned the touchdown was very smooth; did the smoothness cause your hand movements to be disrupted?

A35: It wasn't so smooth that I only noticed touchdown when the speed brakes rose; I could definitely feel the touchdown physically. I saw the speed brakes moving in my peripheral vision. My hand movements were not disrupted by the smoothness. The touchdown didn't drift long; as seen from the touchdown point, it was an early touchdown.

Q36: When pulling the reversers, was the nose moving toward touchdown, or was it still up?

A36: Usually, pulling the reversers creates a pitch-down moment, but there was no sign (movement) of it going down at all, so I pushed (the column) myself.

Q37: How was your sleep during the rest period?

A37: During the first rest, it was midday in Japan time and I couldn't sleep at all. I didn't sleep much then, but during the second rest, I slept for about an hour. That was a little over two hours before landing.

Q38: Regarding the PM's callouts from touchdown, was there no "ROLLOUT" call?

A38: Rather than whether ROLLOUT engaged or not, because it switched to TOGA, the ROLLOUT arm also disappears. Therefore, I think a TOGA callout was appropriate.

Q39: At what timing was the "SPEED BRAKE UP" call?

A39: I believe it was after it switched to TOGA. It's not something that can be said the very instant of touchdown; it was after it became TOGA.

Q40: Did you see the speed brakes deploy, operate the reversers, apply full reverse, and then move them back?

A40: Before reaching full reverse, it was already in TOGA, and for a moment I didn't understand the situation and hesitated whether it was okay to pull. Since the autobrakes hadn't disengaged, I decided a go-around was not an option and stopped the operation once. After hesitating for a few seconds, I pulled to full reverse and pushed (returned) the column.

Q41: Regarding the grip on the thrust levers, do you use your wrist when raising them?

A41: It's a feeling of raising them upward. My hands are small, so I can't use my wrist as a lever; it's like I'm raising them from the elbow, a pulling-up motion from the elbow.

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Pilot Monitoring (PM/ COP)

Q1: How was your health, fatigue level, and sleep duration on the day of the event?

A1: There were no problems. There were no conditions out of the ordinary.

Q2: What was your previous experience flying with this crew member?

A2: This was my second time flying with CAPM. While it was my first time flying with PIC on an actual flight, we had flown together in the simulator. We were also acquainted through committees and other activities.

There were no issues regarding our relationship.

Q3: Were there any noteworthy items prior to departure?

A3: I could not recall this precisely during the initial talk, but clarifying my memory now: the TAF was not very good to begin with and worsened during the flight beyond the initial forecast. In response to the changing TAF, we maintained contact with OMC and continued the flight while considering our options.

Otherwise, there were no issues with passengers, MEL items, or aircraft equipment.

I was aware that this specific flight has a general tendency for delays.

Information regarding the closure of P-Taxiway was received during the POBS briefing as a factor affecting the day's operation.

Q4: Please describe the situation at the time of the event to the best of your memory.

A4: Upon entering the approach area, we were informed that only aircraft capable of High Category approaches could proceed due to bad weather. Since all three crew members were CAT-qualified, we responded to ATC that we were capable.

RVR and other conditions were reported several times. I recall hearing values below CAT 2 minima.

Preparations for CAT 3 were conducted using the approach checklist while verifying all aircraft requirements.

Ultimately, we were on radar vectors. CAT 2 "Just Minima" was reported. Later, RVR 1600 was reported, and we confirmed we were above CAT 3 minima, including Mid-point and Stop-end RVR.

There was a tailwind component on final, but the PIC predicted it would change to a headwind midway. The wind change was not as significant as expected; it was generally stable on final.

I confirmed the "LAND 3" status on the ASA (Autoland Status Annunciator).

I had the impression that the FMA changed from FLARE to IDLE almost simultaneously (it felt faster than in the simulator).

The touchdown was smooth.

I recognized that the speed brakes had deployed, which, combined with the physical sensation, confirmed the aircraft had touched down.

After noticing that the FMA did not transition to ROLL OUT even though speed brakes were up, I recognized the status was "BLANK | TOGA | TOGA."

I called out, "It's in TOGA."

Since my gaze had shifted to items like the speed brakes, I cannot say I called it the exact instant it transitioned to TOGA, but I spoke as soon as I noticed it.

I do not clearly recall the PF's exact words, but there was an immediate and clear response, and I believe we reached a mutual understanding. The PF then disconnected the A/P and initiated corrective action.

The "TAIL STRIKE" message appeared.

I checked the situation after arriving at the cabin, but no comments were received from passengers. In the aft cabin, I heard a remark that "the sound was a bit loud," but they attributed it to the autoland.

Additionally, no discomfort or abnormality during nose gear touchdown was reported in the cabin.

Regarding whether the TOGA switch was pressed: within the scope of my cross-checks and field of vision, I believe it was not pressed. I do not know why it transitioned to TOGA.

Even after recognizing the TOGA mode, the thrust levers remained in the "Close" position, and the thrust indicators matched the lever positions. I could not understand the reason for this.

After disconnecting the A/P, the PF maintained the centerline and lowered the nose gear softly.

My initial sense of abnormality came from the fact that ROLL OUT did not engage despite the speed brakes deploying.

Q5: What was your eye-scan flow?

A5: I was monitoring FMA changes. I confirmed touchdown through speed brake activation and physical sensation. Feeling something was wrong when it didn't change to ROLL OUT, I glanced at the speed brakes for a moment. When I looked back at the FMA, it showed TOGA | TOGA.

Q6: What was the situation and what call-outs were made when the aircraft pitched up after touchdown?

A6: The pitch increased at a very high rate. I called out that we were in TOGA mode.

Q7: What was your scan pattern?

A7: Below AH, it was the standard pattern. When the PF disconnected the A/P, I switched from the standard CAT 3 scan to a pattern that included looking outside.

Q8: Was there anything unusual about the PF's operations or movements?

A8: No, there was not.

Q9: When and how did you realize the pitch-up after touchdown was caused by the A/P?

A9: I had the impression that the pitch continued to rise sharply and continuously from the flare after touchdown.

Q10: Did you feel the tail strike physically?

A10: At the time, I did not have a definitive physical sensation of scraping the tail.

Looking back later, the angle at which the pitch-up stopped matched the tail contact value recorded in the AOR.

We performed the NNC after vacating the runway.

Q11: How was the communication with ATC?

A11: I suspect the event might not have been visible from the Tower.

Initial contact with ATC was as per normal procedures.

Q12: What were your interactions with the local maintenance staff after arrival?

A12: I was not always present with the PIC during discussions. We divided tasks, such as gathering information on the cabin status.

Q13: How was the log entry made?

A13: We logged the messages that appeared on the EICAS. We recorded: "EICAS MSG 'TAIL STRIKE' AFTER AUTO LAND STAT MSG 'TAIL STRIKE CHANNEL 1' 'TAIL STRIKE CHANNEL 2' AFTER AUTO LAND."

Q14: Prevention of Recurrence

A14: I was monitoring mode changes and the situation with confidence.

There were parts of the aircraft's behavior that I could not understand until the very end.

Regarding the PF's response, I received an immediate acknowledgment to my call-out of the TOGA mode. In a CAT 3 approach where Auto Rollout is expected, deciding whether to disconnect the Auto Pilot is a difficult judgment call. However, the PF handled it appropriately, maintaining the centerline and minimizing the G-load during nose gear touchdown.

Since the system entered TOGA mode after touchdown despite my awareness that the TOGA switch was not pressed (and even if it were, it should have been inhibited), it likely impacted my thought process for a fraction of a second. Even if presented with the same situation again, I don't believe one would immediately decide to disconnect the Auto Pilot just because the flare pitch-up speed felt fast during a CAT 3 operation.

Q15: How did you perceive the pitch-up situation?

A15: There was no distinct change in the perceived G-load as the pitch increased.

It felt as if the pitch change for the flare continued uninterrupted until tail contact.

Q16: Did you suggest a runway check to ATC?

A16: During taxiing, I did not make any external contacts other than standard ATC communication.

After the door opened, I informed the ground personnel of the situation.

After deplaning, a person I met near the PBB, likely a local manager, advised me that the tail contact had already been reported to the airport authorities and that the airport would perform a runway check at their discretion.

Q17: Please describe what happened from the day before the flight until the start of your shift.

A17: My duty on the previous day was home standby. I had approximately 7 to 8 hours of sleep.

Since my departure time from home was not that early, I recall getting the 7 to 8 hours of sleep I usually require and feeling in peak physical condition. It had been a while since I last flew to IAH, so I prepared thoroughly to my own satisfaction.

Q18: How did you take breaks while on duty?

A18: For this flight's rest periods, I was able to sleep soundly during the first of the six-way split rest periods. During the second rest period, I didn't perform any tasks but focused on closing my eyes and resting my brain; I believe I slept for about 20 minutes during that time.

Q19: How did you callout when Roll Out was displayed when the event occurred?

A19: I did not make a "No Roll Out" call. I determined that calling out the "TOGA | TOGA" status was a higher priority.

Q20: How did you check the aircraft attitude at the time of the event?

A20: I recognized the maximum pitch-up angle through the PFD display rather than external visual cues.

Q21: Regarding the pitch-up, did you confirm the maximum angle on the PFD? The Captain's ASR (Aviation Safety Report) states it was approximately 7.5 degrees; was that your understanding as well?

A21: Yes, that is correct. Since I was also monitoring other items like the FMA, thrust, and reverse thrust status, I wasn't watching the PFD increase continuously. I don't recall exactly what the angle was at each specific moment, but I confirmed on the PFD that the pitch reached an abnormal level.

Q22: Finally, please share your thoughts on this event.

A22: Transitioning to TOGA mode while believing we had touched down, and with the thrust levers not moving, left me confused until the end, thinking, "What is happening? What is this aircraft doing?" The fact that it entered TOGA mode—even though I didn't press the switch and believed it would be inhibited even if pressed accidentally—significantly impacted my situational awareness and thought process.

Given those circumstances, I believe the PF's decision to disconnect the Auto Pilot was extremely difficult, especially during a CAT 3 operation where Auto Rollout is expected and reverse thrust had already been applied, leaving no option but to continue the landing. The way the PF ultimately disconnected the A/P, landed the nose gear with minimal shock, and maintained the centerline was, in my opinion, an exceptional response. If faced with the same situation again, determining what can be done instantaneously remains a very difficult challenge.

End of Memo

Jump Seat (CAPM)

Q1: How was your health and fatigue level on the day of the flight? Please include your condition before the flight, during the flight, and during rest periods.

A1: Everything was normal before the flight, as usual. There were also no issues during the rest period.

Q2: How has your recent sleep pattern been?

A2: I had no particular trouble sleeping at night. I had been on leave for about two weeks prior to this flight. Since I hadn't been flying and was resting at home during that time, my health was in good condition.

Q3: What is your past experience, relationship, and impression of the crew members you flew with?

A3: The PIC was my section leader when I was promoted to Captain; we also flew together on the B767 and have known each other for years. I had flown with the COP about two years ago on a European route. I was acquainted with both, and our relationship was completely professional and without issue.

Q4: Were there any noteworthy items during flight planning?

A4: As a point of note, there was a weather threat indicating Houston's weather would likely be Category 2 or 3 until just before arrival, but otherwise, everything was as usual.

Q5: Were there any specific notes regarding the aircraft status or passenger information?

A5: There were no MEL items, and the aircraft was in normal condition. Regarding passenger information, we were informed there were just under 10 passengers requiring wheelchairs.

Q6: Were there any factors hindering on-time performance?

A6: The PIC was reviewing the FID (Flight Information Display) and mentioned that delays were expected daily for Houston flights. I recognized that the gates are consistently tight, and things felt a bit congested.

Q7: Please provide a reflection on this flight.

A7: The three of us shared a common awareness that the weather in Houston was a threat due to fog until just before landing. I returned to the cockpit shortly after TOD, and the approach briefing had already been completed while we were descending. When I took the jump seat, I was informed of the ATIS; visibility was about 1/2 SM and had momentarily dropped to 1/8 SM, so we shared the plan to conduct a Category 3 approach. ATC also stated that only Category 2 or 3 approaches were possible. Since both the aircraft and crew were capable, we confirmed we could perform a Category 3 and proceeded with the approach. Although ATIS only listed visibility without RVR, ATC was reporting all three RVRs periodically. The numbers were improving to the point where they were definitely Category 3 ABV or even Category 2, so I recognized the approach was weather-permissible. The approach itself followed a typical U.S. "Descend via STAR," then HDG CLR ILS. Operation was normal and the aircraft was stable until touchdown. There were no issues regarding the Stabilized Approach criteria. An easterly wind was slightly prevalent, and I estimated a tailwind (TW) of just over 10 knots, which the PIC also noted was a bit strong. However, it eventually became a light variable (VAR) wind, and we shared that it was within limits. I was looking outside from around RA 200 ft (Approaching Minimums) and recall seeing the runway at approximately RA 130 ft. After that, the runway remained in sight. I recall that the flare seemed a bit later than the typical "Flare/Idle" sensation during Category 3 training in the simulator. I believe the mode was engaged, but when I looked forward during Flare/Idle, the thrust had been retarded to near idle. Upon touchdown, as the speed brakes deployed, I looked outside and noticed the pitch increased sharply. I glanced down at the PFD and saw it had reached approximately 7.5 degrees. Just as I thought "This is bad," the PIC disconnected the A/P and pushed the nose down. At that moment, I did not recognize that the FMA mode had changed to TOGA. The "Tail Strike" EICAS message appeared during the landing roll. Around the time we vacated the runway, the other two crew members mentioned it was in

TOGA mode. I looked and saw Rollout was still armed, the autothrottle was disconnected, and it was in TOGA. It was only after landing that I first realized we were in TOGA mode.

Q8: How was the air condition during the approach?

A8: The air was extremely smooth.

Q9: Despite the tailwind (TW) approach, how was the cockpit atmosphere and workload?

A9: I don't believe the workload was particularly high. Based on the pre-departure TAF, I expected a slight easterly wind and thought we might be in an east flow rather than a west flow, but aloft, it was nearly wind calm. While it was variable (VAR) on the ground, some easterly wind remained aloft, and I think all three of us had an initial awareness of an easterly wind component. Traffic wasn't very heavy, so it was a very standard operation.

Q10: You mentioned the approach was stable. From your perspective in the jump seat, were there any differences or abnormalities compared to a normal CAT 3 approach?

A10: None in particular.

Q11: How was the FMA during the approach?

A11: I believe the FMA was normal until touchdown. "LAND 3" was definitely displayed. I remember the PIC saying during the approach, "If LAND 3 comes up after this, we're good," and then seeing LAND 3 appear. Therefore, I believe the FMA modes were normal until touchdown.

Q12: How were the PM's callouts?

A12: While looking outside from RA 200 ft, I felt the flare was momentarily late. I recall the interval when the COP called "Flare, Idle" felt very brief—shorter than what we usually experience in the simulator. I honestly don't

remember if the COP said "It's in TOGA" after touchdown, and I don't recall the specific dialogue between the two or exactly when the assertion was made.

Q13: Please describe the changes in the FMA after touchdown.

A13: While looking outside, I noticed the pitch increase sharply. I immediately looked at the PFD and saw it had reached 7.5 degrees, but at that moment, I didn't realize it was in TOGA. It wasn't until after touchdown, around the time we vacated the runway, that I first recognized it had entered TOGA mode.

Q14: How did you feel during that situation?

A14: This was my first experience, including simulators and actual aircraft, seeing the pitch rise that much. When it happened after touchdown, I didn't immediately understand what was occurring. I feel the same confusion was likely happening to the other two a few seconds prior. It took a few seconds to process the situation. I never imagined it would enter TOGA mode; I initially thought the pitch rise might be part of the Autoland sequence, but I didn't expect it to be so sudden or sharp. Because I trusted the Category 3 Autoland at the moment of touchdown, I remained in a state of confusion for several seconds, wondering what was happening.

Q15: Regarding the FMA change, how were the PM's callouts (volume, tempo, etc.)?

A15: The volume was sufficient as I could hear it from the back. The only thing was that the interval for "Flare, Idle" felt very instantaneous. It likely didn't transition to Rollout, so I don't believe there was a "Rollout" call. I didn't personally hear the assertion that it was in TOGA; I think there was a gap of a few seconds where we wondered why the pitch was rising before the COP made the assertion and the A/P was disconnected.

Q16: Was there a "Rollout" callout?

A16: I believe the COP was monitoring the FMA modes, but since it didn't enter Rollout, he didn't call it. I suspect the COP also had a few seconds of confusion before recognizing it was in TOGA and making the assertion. In my memory, I don't think he said "No Rollout."

Q17: Did you notice any differences in the PF's operations compared to your own?

A17: I didn't notice any differences until touchdown. It seemed standard.

Q18: When the aircraft pitched up after touchdown, how did it feel, when did you notice it, and what was the sequence of events?

A18: While looking outside, the aircraft touched down and the speed brakes deployed in front of me. Then the nose pitched up sharply. I wondered what was happening, glanced down, and saw the pitch was high—at about 7.5 degrees. By then, the PIC was already disconnecting the A/P. After touchdown, I think it took all three of us a few seconds to recognize what was happening, and by that time, the pitch had already peaked and the tailstrike had likely occurred.

Q19: You reported that the flare was late; how were the G-forces during the sink and the timing of the thrust retard?

A19: It didn't feel like we sank due to rough air; both the air and the aircraft were stable. However, the tailwind (TW) was a bit strong, and the sink rate was likely around 900 fpm, which might have had an effect. Compared to my own sensation during a manual landing, the A/P's flare initiation felt late. The thrust reached idle almost immediately after entering the flare.

Q20: After the pitch-up, when did you realize it was caused by the A/P?

A20: Since we were performing a Category 3 Autoland and Auto Rollout, and the PF had not disconnected the A/P after touchdown, I maintained the awareness that the pitch was rising while the A/P was still engaged in the Autoland state.

Q21: Did you recognize the auto speed brake activation by sound or sight?

A21: By sight. I saw the speed brake lever moving up in my field of vision.

Q22: What were the G-forces and aircraft movements felt from the jump seat?

A22: The landing itself was very smooth. Even when the pitch increased sharply—and the tail was likely already scraping before the PIC finally disconnected the A/P—there was almost no vibration. I believe the PIC's inputs after disconnecting prevented the nose from slamming down; there was just a slight impact when the nose gear touched. Overall, the G-forces and impact felt smoother than a typical landing.

Q23: How was the communication and atmosphere between the two pilots when the unexpected pitch-up occurred?

A23: I believe the communication was very good. The PIC had fostered a positive atmosphere from the beginning, creating a relationship where anyone could speak up. Cockpit coordination was smooth.

Q24: How were the sound and impact at the moment of tail contact?

A24: There was almost no impact or sound in the cockpit. Just as we touched down, lowered the nose, and were about to vacate the runway, the "Tail Strike" EICAS message appeared. Given how high the pitch had been, I had a suspicion, but I couldn't confirm it through sound or vibration. It was the EICAS message that made me realize it.

Q25: Where was the non-normal checklist performed?

A25: It was performed after vacating the runway.

Q26: How were the crew's tasks and coordination at that time?

A26: Since all three of us recognized the "Tail Strike" message and knew we had scraped the tail, there was likely some agitation, but we prioritized blocking in since the gate was close. There was no impact, and we didn't judge it to be an evacuation event. The consensus was to focus on blocking in and ensuring we didn't misinterpret ATC instructions due to the poor visibility from the fog, then address the situation after reaching the gate. Despite some agitation, the checklist was performed calmly.

Q27: Please describe the ATC communications in chronological order.

A27: After the tailstrike and performing the checklist, we discussed whether to inform ATC. However, because the gate was nearby and we didn't know the extent of the damage, we decided to prioritize blocking in first. After blocking in, we consulted with the ANA Airport Manager regarding reporting the event to Houston Airport; he mentioned that it was already reported and that a runway check would be conducted if necessary. From the moment of the tailstrike until blocking in, we did not send an initial report to ATC.

Q28: At what timing and location was the checklist performed?

A28: It was performed on taxiway NA, just before being told by Ground to "Hold short of NK" after vacating. We didn't request to hold; it was conducted during the stop instructed by ATC.

Q29: Please describe the interaction with the mechanics after blocking in.

A29: I did not communicate with them from the back. Upon blocking in and contacting Ground as per normal procedure, the possibility of a tailstrike was reported. There was a discussion with the PM on how to record it in the log. After deplaning, the PIC went down to inspect the aircraft himself. At that time, we were informed that part of the VHF antenna had also been scraped. We recognized the aircraft was grounded and discussed the necessity of filing an ASR (Air Safety Report).

Q30: What was discussed after deplaning?

A30: By the time we blocked in, all three of us recognized that the system had entered TOGA after touchdown, so we felt that the TOGA engagement was the core issue. We reflected that the TOGA mode caused the pitch-up and that we should have disconnected the A/P sooner. The PIC (PF) had no recollection of pressing the TOGA switch and stated he didn't know why it entered TOGA mode and pitched up. From my perspective in the back, those switches require a deliberate press, and my impression was that they were not pressed. We discussed the mystery of why it entered TOGA and acknowledged that there were several seconds of confusion when it happened; the takeaway was that we should have disconnected the A/P immediately upon the anomaly.

Q31: Question from the Safety & Quality Promotion Division: Regarding the PF's hand movement from the thrust levers to engaging reverse thrust, were there any abnormalities or observations?

A31: There were no abnormalities. When the aircraft touched down and pitched up, and I moved my eyes to the PFD, the PIC's hand was already near the idle position on the thrust levers. There was likely a gap of a few seconds due to the confusion over what was happening; his hand didn't move to reverse immediately at touchdown, but rather there was a short blank period before he reached for the reversers (RVS). However, I don't recall any motion that suggested touching the TOGA switches while moving from idle to RVS; it looked normal. I think the sharp pitch-up caused a few seconds of cognitive delay, which resulted in a slightly later reach for the RVS than usual, but the operation itself felt standard.

Q32: Did the PF's hand move to the reversers before the speed brakes deployed?

A32: No, that was not the case. Rather, because of the sudden pitch-up, I believe the reach for the RVS was actually later than usual.

End of Memo