

From: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
Subject: QRC Sim Testing - Runaway Stab Trim - B 737 NG
Date: Wednesday, August 7, 2019 4:54:12 PM
Attachments: [image001.jpg](#)
Importance: High

[REDACTED],

During the latest MAX meeting here in Dallas we started a group discussion about Air Carrier Pilot use of Quick Reference Checklist (QRC) vs Memory Items per Boeings Flight Crew Operating Manual (FCOM). This discussion followed your presentation on the recent MAX MCAS catastrophic failure test result when an AEG test pilot required 16 seconds to complete his response to a Runaway Stab Trim (RST) Non Normal (NN) that was MCAS related. After the meeting I reviewed the FAA guidance for Air Carrier use of a QRC in lieu of manufacturers (Boeings) Memory Item NNC FCOM guidance (Referenced below). I became concerned about SWA use of the QRC in light of Boeings approved certification response times. During last week's briefing I understood your presentation to indicate that Boeing is permitted to take credit for a pilot recognizing a runaway stab trim in 1 second. Further, you briefed us that during a recent MAX test one of the test pilots required 16 seconds to recognize and fully complete the Runaway Stab Trim NN checklist (by memory) and that this response time permitted MCAS to run the Stab Trim nose low to a result which led to a catastrophic test failure result (Exceptional Pilot Skill Required).

Like many U.S. carriers, SWA pilots use a Quick Reaction Checklist (QRC) in lieu of memory items for completion of the Runaway Stab Trim NNC across all their SWA B-737 variants (NG & MAX). The only procedure SWA has on their QRC that includes memory items is Rapid Decompression. I was curious about potential discrepancy between the response time of SWA flight crews using a QRC versus the Part 25 certification standard Boeing applied using the memory item approach. I decided to spot check some SWA line crews following simulator events I observed. On three events observed over the past few weeks I asked the line crews if they would be willing to participate in a short, non-jeopardy evaluation of a Non-Normal procedure. All three CKA and line crews agreed to participate without reservation. Please keep in mind this was a test of a SWA line crew responding to a Runaway Stab Trim (RST) NN in an NG simulator.

With that background here is what I recorded:

7/19/2019 – B-737-800 Level D FFS – PF = CA & PM = FO/Test conducted after satisfactory LOE

Time to recognize RST NN and call for QRC = 7 seconds.

Time to complete QRC to step 5 – Stab Trim Cutout Switches – Cutout 49 seconds.

7/22/19 – B-737-800 Level D FFS – PF = CA & PM = FO/Test conducted after satisfactory LOE

Time to recognize RST NN and call for QRC = 9 seconds.

Time to complete QRC to step 5 – Stab Trim Cutout Switches – Cutout 53 seconds.

7/23/19 – B-737-700 Level D FFS – PF = FO & PM = CA. Test conducted after satisfactory EET/UPRT

Time to recognize RST NN and call for QRC = 11 seconds.

Time to complete QRC to step 5 – Stab Trim Cutout Switches – Cutout 62 seconds.

Discussion:

In all three of these events the line crews were experienced and all three crews knew they were about to receive a NN event that would lead to response using SWA procedures listed on the QRC (they knew more than a line crew operating in the NAS would have). One reason line crews do not respond as Boeing expects is because they are used to the trim wheel moving by Speed Trim. Differentiating Speed Trim from a runaway trim NN does not happen in 1 second. Also, these crews enjoyed foreknowledge that the NN was coming and one contained on the QRC. Finally, we have to acknowledge that this sample size (three line crews) is inadequate to draw a statistically significant result.

Conclusion:

Acknowledging these testing limitations I believe that this test is adequate to warrant further investigation by AEG regarding the wisdom of current FAA guidance which permits Air Carriers to replace manufacturer memory items on Non Normal Checklists with a QRC. At the AEG level and for the Scientific Advisors to the Administrator I included on this email I request that this issue be considered for a priority review prior to the MAX return to service. I am aware that the certification assumptions are a part of the MAX MCAS overall review process, however, I believe this sample test points to a substantial and important disconnect between certification assumptions and line pilot execution when using a QRC.

My intent is conducting these tests and providing this email is to facilitate further discussion on the QRC vs Memory Item NNC response as a follow on to our preliminary discussion during the recent MAX MCAS briefing in Dallas. I was surprised by the SWA line crew recognition times I reported above. The QRC is far more clumsy and cumbersome for responding to NNC's than I realized or had anticipated. In light of the two fatal MAX accidents I believe that this is the appropriate time for a thorough evaluation of the FAA's approval to use QRC's as an alternate means of compliance to Boeings memory item guidance in their source document (FCOM).

Finally, I suspect the QRC can still be a valuable tool for the crew, however, it may be a safer option for the memory item steps in the Boeing FCOM to remain memory items on the QRC. In this concept the PF would execute the memory items while the PM would pull the QRC and verify proper checklist completion by the PF. The crew would then pick up the QRC at the step after the memory items or if there were none proceed to the QRH as required to complete the full NNC. Please let me know if you have any questions regarding this email.

Reference:

8900, Sec 3, CH 32 (3-3155 (G)): For those operators who intend to convert immediate action items to or from challenge-do-verify items on an emergency checklist, POIs shall require that they test the modified procedure to ensure that it is safe, effective, and has no adverse effects. POIs shall consult with the appropriate Aircraft Evaluation Group (AEG) before approving such changes.

V/R,

A large black rectangular redaction box covers the signature and name of the sender. The redaction is complete, obscuring all text in this area.