

## NOV 27 2019

RA-19-03531

Mr. John Piccola Manager, AIR-860 BASOO Branch Department of Transportation Federal Aviation Administration 2200 S. 216 Street Des Moines, WA 98198-6547

Dear Mr. Piccola,

Subject:

Submittal of Preliminary "737MAX Speed Trim System (STS) Integrated System

Safety Analysis (ISSA)" in Support of P12.1.2 TIA

Model:

737-8, 737-9 PS18-0837

RA Project No.: EASA Project No.:

0010059715

EASA Level:

Non-Basic

Response Requested:

December 9, 2019

**Expedited Flow:** 

Yes

In Reply to:

860-19-0820

References:

(a) Boeing Document D241A018-25 Rev New - Preliminary; "737MAX Integrated

Speed Trim Safety Analysis"

(b) Re-Submittal of Incremental Update to CP 23168 Revision N "737-8 / 737-9 Flight Control Computer Software Replacement (Version) P12.1.2)", dated

October 19, 2019

(c) Boeing Letter RA-19-02768, Submittal of Preliminary "737MAX Integrated Speed Trim Safety Analysis" in Support of Alignment to Proceed with 25.1302 Evaluations, dated September 10, 2019

(d) FAA Letter 860-19-0280, dated October 1, 2019

(e) Boeing Letter RA-19-03046, Submittal of Preliminary "737MAX Integrated Speed Trim Safety Analysis" in Support of 25.1301/25.1309 Certification e-Cab Testing, dated October 7, 2019

(f) 10/31/19 email correspondence from FAA Jason Takisaki, subject ": RE: iSSA Follow Up"

(g) 11/14/19 Boeing/FAA/EASA meeting on EASA's (7) high-level comments (iSSA, S&MF)

Special Instructions:

Please forward the enclosed document to Mr. Ken Paoletti and Mr. Jason Takisaki, Mechanical/Flight Controls, Mr. Tom Phan, Avionics/Software and Mr. Shaun Ripple Flight Test.

An expedited reply is requested to support the P12.1.2 Type Inspection Authorization.

This letter is to submit:

Preliminary Compliance Data Deliverable:



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Please find enclosed the reference (a) document which is the final submittal of the preliminary ISSA identified as deliverable 30 in the reference (b) certification plan. The enclosed document contains updates to the document previously submitted to your office via the reference (c) and (e) letters and incorporates comments received via the reference (d) letter. This document is being submitted in support of P12.1.2 TIA.

The following provides Boeing's summary of known changes still required ahead of release of the final ISSA Deliverable #28.

(b) (4) (b) (4)

Updates will be included, as described below.

Section 1: Introduction

No further updates required. Section is in final form.

Section 2: System Description

No further updates required. Section is in final form.

Section 3: Logical Architecture

(b)(4)

<u>Section 4: Functional Hazard Assessment</u> No further updates required. Section is in final form.

Section 5: Failure Modes and Effects Analysis

(b)(4)

Section 6: Fault Tree Analysis

(b)(4)

Section 7: Common Mode Analysis

(b) (4)

(b)(4)

Section 8: Single and Multiple Failure Analysis
No further updates required. Section is in final form.

Section 9: Development Assurance Summary
No further updates required. Section is in final form.
Section 10: Compliance Summary
No further updates required. Section is in final form.



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Appendix A: Use of Operational Probability

No further updates required. Section is in final form.

Enclosures A) and B) are copies of the current Preliminary ISSA and redline comparison against the prior reference (e) 10/7/2019 submittal. Enclosure C) is a copy of the current all-regulator ISSA comments and response spreadsheet. Enclosures D) and E) provide the qualitative AND gate analysis and supporting schematics requested via reference (f), and presents supplemental data to Section 7 of this preliminary document submittal. Enclosure F) presents a brief summary of the disposition of EASA's high level ISSA comments which were discussed in the reference (g) Boeing/FAA/EASA meeting. Enclosure F is being provided for FAA awareness.



Cognizant E-UMs for the following System-Subsystem(s) have reviewed the P-ISSA and Enclosures A), D), E) and F) as SMEs, for accuracy and completeness in order to support the upcoming P12.1.2 certification flight testing:

Avionics-ADIRU
ETOPS-General
Flight Controls-Autoflight
Flight Controls-Electronics
Flight Controls-F/C Primary & Secondary

This letter is being sent for:

Boeing requests FAA acknowledge this submittal by the requested response date in support of P12.1.2 TIA

Please contact this office or the following individuals if you have further questions:

Project Administrator (PA): (b) (6)

Program Manager: (b) (6)

at (b) (6)

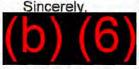
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ECCN: 7E994

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(for) Elizabeth A. Pasztor
The Roeipo Company ODA Lead Administrator
MC 081-53





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Enclosures:

A) Boeing Document D241A018-25, Rev. New - Preliminary 11/4/2019
B) Red Line Comparison File against 10/7/19 draft
C) Consolidated Integrated Speed Trim System Safety Analysis Comments List
D) Qualitative AND Gate Analysis (FAA Action 555)
E) Qualitative AND Gate Analysis Supporting Schematics (FAA Action 555)
F) EASA's High Level Comments on the ISSA

Name	SP	Encl	MC	Title
Mr. P. Adjibly	X	X		FAA Program Mgr., 0600-1222
Mr. J. Sutherland	X	X		FAA Program Mgr., 0600-1222
Mr. J. Voytilla	X	X		FAA Program Mgr., 0600-1222