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MID-Region

Airplane States Awareness (ASA) – Low Speed Alerting

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Disclaimer

This document has been compiled by members of the aviation industry to provide guidance for air operators and other stakeholders to have low airspeed systems that alerts flight crews when airplane reaches its minimum maneuvering speed in order to reduce the risk of Loss of Control In-flight (LOC-I) accidents. It is not intended to supersede or replace existing materials produced by the National Regulator or in ICAO SARPs. The distribution or publication of this document does not prejudice the National Regulator's ability to enforce existing National regulations. To the extent of any inconsistency between this document and the National/International regulations, standards, recommendations or advisory publications, the content of the National/International regulations, standards, recommendations and advisory publications shall prevail.

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Airplane States Awareness (ASA) – Low Speed Alerting

1. INTRODUCTION

1.1 A CAST study of 18 loss-of-control accidents and incidents showed that, in many situations, the flight crew failed to properly respond to and recover with how they had been trained from an unexpected upset, approach to stall, or stall situation resulting from flight crew loss of Airplane State Awareness (ASA).

1.2 The purpose of flight crew alerts on airplanes is to attract the attention of the Flight crew and to inform them of specific abnormal airplane system conditions or certain abnormal operational events that require their awareness, and, in modern alerting systems, to advise them of possible actions to address these conditions.

1.3 The purpose of this Safety Advisory is to reduce the risk of loss-of-control accidents by having low airspeed systems that alerts flight crews when airplane reaches its minimum maneuvering speed.

2. DESCRIPTION

2.1 Loss of Control In-flight (LOC-I) refers to accidents in which the flight crew was unable to maintain control of the aircraft in flight, resulting in an unrecoverable deviation from the intended flight path. LOC-I can result from engine failures, icing, stalls or other circumstances that interfere with the ability of the flight crew to control the motion of the aircraft. It is one of the most complex accident categories, involving numerous contributing factors that act individually or, more often, in combination.

2.2 Loss of Control In-flight was identified as a high risk category for MID Region to be addressed within the framework of RASG-MID due to its high non-survivability. One of the precursors for Loss of Control – In-flight was identified as low airspeed alert.

2.3 To improve flight crew awareness of low airspeed, manufacturers should develop and regulators should ensure implementation of systems that alerts flight crews when airplane reaches its minimum maneuvering speed.

2.4 On airplanes with no flight envelope protection, in order to improve early flight crew awareness of decreasing energy State, manufacturers should develop and implement multisensory low speed alert at the caution level in existing airplanes, as practical and feasible.

2.5 IATA consulted with manufacturers of Boeing, Airbus, Embraer and Bombardier aircraft to determine the status of their fleet with regards to low airspeed alert.

Boeing Fleet

2.6 Low airspeed alerting is basic on the 787, 777, 747-8, 767-400 {with the Large Format Display Systems (LFDS)} and 747-400.

2.7 It is an option on the 737-600/700/800/900 and there is a service bulletin available (SB 737-34A2292). The SB adds an aural Caution ("AIRSPEED LOW") from EGPWS to the amber visual indications (box around airspeed flashes amber) on the Primary Flight Display (PFD).

2.8 It is not basic, not an option, and no service bulletin is available for the 757, 727, MD-90, MD-80, 737-100/200/300/400/500 or the 767 airplanes (with the exceptions noted above).

Airbus Fleet

2.9 Low airspeed alerting is basic on the Fly by Wire aircraft (A320 family, A330, A340, A350 and A380). The Flight Envelop Protections implemented in these aircraft have been judged as compliant with the new requirements. Furthermore, these aircraft are already fitted with a "Speed, Speed, Speed" aural alert based on the energy of the aircraft.

2.10 It is not basic on Non Fly by Wire aircraft (A300 & A310). The discussions with the FAA are ongoing to determine if the current design of these aircraft (in particular the aircraft with alpha-floor function capability) is compliant with the new requirements.

Embraer Fleet

2.11 EMBRAER 170/175/190/195:
No Low Speed Alert available, either factory-original or via SB. Stall protection is provided first by a stick shaker, and then by alpha protection (through fly-by-wire system), both based on angle-of-attack and not purely airspeed. These features are factory-original and equip all aircraft delivered.

2.12 ERJ 135/140/145:
No Low Speed Alert available, either factory-original or via SB. Stall protection is provided first by a stick shaker, and then by a stick pusher, both based on angle-of-attack and not purely airspeed. These features are factory-original and equip all aircraft delivered.

Bombardier Fleet, ATR Fleet, Eastern Built Aircraft

2.13 No data available.

2.14 IATA compiled preliminary statistical data from different sources to identify the number of operators and their fleet in MID Region. The attached table "MID States Airlines & Fleet tracking sheet" outlines the breakdown of the airlines and the number of aircraft in Middle East based carriers including the non-IATA members. The table shows that there are 1481 aircraft registered in the MID Region of which:

- 949 New Generation aircraft with glass cockpit having the provision of low speed alert .This figure represents **64% compliance** rate.
- 217 Classic western built aircraft representing 15 % of the total fleet in Mid Region.
- 123 Regional Jets representing 8%.
- 124 Eastern built aircraft representing 8%,
- 68 Turbo Prop aircraft representing 5 %.

3. RECOMMENDED ACTION

3.1 Operators to incorporate existing service bulletins from manufacturers that provides low speed alert functionality.

3.2 States' to review and verify the registered operators and their fleet provided in the table "MID States Airlines & Fleet Tracking Sheet" and provide IATA with feedback to continue with the DIP milestones.

3.3 IATA will track implementation of its member airlines and report progress to MID-RAST.

References:

RAST-MID/LOC-1/1
FAA AC 25.1322-1; Flight crew alerting

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