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Minimum Aviation System Performance Standards (MASPS) for Aircraft State Awareness Synthetic Vision Systems

RTCA DO-371
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FOREWORD

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EXECUTIVE SUMMARY

RTCA/DO-371 was originally prepared by RTCA Special Committee 213 (SC-213). It was approved by the RTCA Program Management Committee on January 9, 2018. This document expands the previously defined DO-315A intended function of an SVS beyond that of supplemental view of the external scene to include enhanced aircraft attitude and energy state awareness and defines a system that is intended to be presented full-time on the pilots' full color Primary Flight Displays (PFD). This document has been harmonized with EUROCAE Working Group 79 (WG-79). This document is technically equivalent to ED-249.

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TABLE OF CONTENTS

1 PURPOSE AND SCOPE 1

1.1 Introduction 1
1.1.1 Purpose 1
1.1.2 Structure of the Document 1
1.2 Introduction to Aircraft State Awareness Synthetic Vision System (ASA SVS) 2
1.2.1 Aircraft State Awareness Synthetic Vision System Overview 2
1.2.2 Aircraft State Awareness Synthetic Vision System Elements and Block Diagram 4
1.3 Aircraft State Awareness Synthetic Vision System Operational Concept 5
1.4 Aircraft State Awareness Synthetic Vision System Intended Functions 6
1.5 Use of Key Words 6
1.6 Aircraft Equipment Information Vulnerabilities 6
1.7 Anticipated Future Growth 7

2 AIRCRAFT STATE AWARENESS SYNTHETIC VISION SYSTEM GENERAL REQUIREMENTS 9

2.1 ASA SVS General Requirements 9
2.1.1 ASA SVS Scene Depiction Requirements 10
2.1.2 ASA SVS Energy State Symbology Requirements 11
2.1.3 Display Content During Unusual Attitudes 12
2.1.4 Field of Regard 12
2.1.5 Display Minification 12
2.1.6 System Monitoring, Annunciation and Alerting 12
2.1.7 Terrain, Runway and Obstacle Databases 12
2.1.8 Database Assurance (DO-200B) 13
2.2 Features of ASA SVS on a Head-Up Display 13
2.2.1 Additional Head-Up Display (HUD) Requirements 13
2.2.2 Monochrome HUD 14

3 AIRCRAFT STATE AWARENESS SYNTHETIC VISION SYSTEM MINIMUM STANDARD PERFORMANCE REQUIREMENTS 15

3.1 Display Elements 15
3.1.1 ASA SVS Scene Depiction 15
3.1.2 PFD Symbology 16
3.1.3 Display Characteristics 16
3.1.4 Display Performance 18
3.2 Databases 19
3.2.1 Runway Database 19
3.2.2 Obstacle Database 19
3.2.3 Database Assurance 19
3.3 Scene Position Data Sources 19
3.3.1 Altitude Source 20
3.3.2 Attitude Source 20
3.3.3 Heading/Track Source 20
3.3.4 GPS Source 20
3.3.5 Display Controls 20

3.3.6 Annunciations 20
3.4 Head Up Display 21
3.4.1 HUD Field of Regard 21
3.4.2 HUD Brightness/Contrast Controls 21
3.4.3 HUD Scene Removal 21
3.4.4 HUD Jitter 21
3.4.5 HUD SV Scene Error 21
3.4.6 HUD Scene Attitude Data Source 22
3.5 System Safety Objectives 22
3.5.1 System Safety Design Process 22
3.5.2 Design Assurance Levels and Demonstration 23
3.5.3 System Environmental Qualification 23
3.5.4 Built In Test 23
3.5.5 System Preventive Maintenance 23
3.6 Flight Data Recorder 23

4 SYSTEM PERFORMANCE DEMONSTRATION 25

4.1 Test Objectives 25
4.1.1 HUD Specific Criteria 25
4.2 Test Flight Phases 25
4.3 Brightness and Contrast 26
4.4 Test Conditions 26
4.5 Test Plan 27
4.6 Evaluation Matrix 28

5 MEMBERSHIP 31

APPENDIX A - ACRONYMS AND DEFINITIONS A-1

APPENDIX B - REFERENCES B-1

B.1 SAE Publications B-1
B.2 RTCA Standards B-1
B.3 EUROCAE Standards B-2
B.4 FAA Regulations B-2
B.5 FAA Orders and Standards B-2
B.6 FAA Advisory Circulars (AC) B-3
B.7 EASA and ICAO Publications B-3

APPENDIX C: OPERATIONAL PERFORMANCE ASSESSMENT C-1

APPENDIX D: SYNTHETIC VISION AIRCRAFT STATE AWARENESS STANDARDS RATIONALE D-1

D.1.1 ASA SVS Scene Depiction (Section 3.1.1) D-1
D.1.1.1 Optical Flow (Section 3.1.1.1) D-1
D.1.1.2 Depiction of Terrain and Runway of Intended Landing (Section 3.1.1.2) D-1
D.1.1.3 Color (Section 3.1.1.3) D-2
D.1.2 PFD Symbology (Section 3.1.2) D-2
D.1.3.1 Behavior During Unusual Attitude (Section 3.1.3.1) D-2
D.1.3.2 Field of Regard (Section 3.1.3.2) D-3
D.1.4.1 Latency (Section 3.1.4.1) D-4

D.1.4.2 Flicker (Section 3.1.4.2) D-4
D.1.4.3 Image Artifacts (Section 3.1.4.3) D-5
D.2.1 Terrain Database (Section 3.2.1) D-5
D.2.2 Runway Database (Section 3.2.2) D-6
D.2.3 Obstacle Database (Section 3.2.3) D-6
D.3.2 Attitude Source (Section 3.3.2) D-6
D.3.4 GPS Source (Section 3.3.4) D-7
D.3.5 Display Controls (Section 3.3.5) D-7
D.3.6 Annunciations (Section 3.3.6) D-7
D.4.1 HUD Field of Regard (Section 3.4.1) D-8
D.4.2 HUD Brightness/ Contrast Controls (Section 3.4.2) D-8
D.4.3 HUD Scene Removal (Section 3.4.3) D-8
D.4.4 HUD Jitter (Sectiont 3.4.4) D-8
D.4.5 HUD Processing Error (Section 3.4.5) D-9
D.4.5 HUD Scene Position Data Source (Section 3.4.6) D-9

TABLE OF TABLES

Table 1-1: Terms for use in Performance Requirements and Test Procedures 6
Table 4-1: Evaluation Matrix 28
Table 4-2: Evaluation Matrix for HUD 29

TABLE OF FIGURES

Figure 1-1: ASA SVS PFD Illustration 3
Figure 1-2: HUD Illustration with ASA SVS Features 4
Figure 1-3: ASA SVS Functional Elements (Notional) 5

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1 PURPOSE AND SCOPE

1.1 Introduction

DO-315A addressed Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS), and Combined Vision Systems (CVS) technologies. This document identifies system and sub-system performance, safety and equipage requirements for the use of this technology under 14 CFR Part 25. These Minimum Aviation System Performance Standards (MASPS) may, in fact, also be applicable to non-Part 25 aircraft, but specific installation and operational deployment issues associated with these other vehicles have not been considered at this time. The performance standards for this SVS-only expanded functionality are updated from DO-315A. This document does not address EVS, CVS or Enhanced Fight Vision Systems (EFVS) or Synthetic Vision Guidance Systems (SVGS).

1.1.1 Purpose

This MASPS provides high level system requirements for an Aircraft State Awareness SVS (ASA SVS). This document expands the previously defined DO-315A intended function of an SVS beyond that of supplemental view of the external scene to include enhanced aircraft attitude and energy state awareness. This document defines a system that is intended to be presented full-time on the pilots' full color Primary Flight Displays (PFD).

Features of an ASA SVS may also be implemented on a Head-Up Display (HUD) or equivalent and standards for this are defined herein. If a HUD replaces the requirement for an HD PFD, this document may not contain all the appropriate requirements to perform the intended function and an additional assessment will need to be performed for compliance. Wherever the term HUD is used in this document, it is meant to be inclusive of a HUD equivalent type device such as a head worn display (HWD).

ASA SVS is intended to prevent the occurrence of spatial disorientation by supporting the pilots' continuous awareness of attitude, altitude, topography and energy state (speed, acceleration and altitude) related to the flight path and perceived motion of the aircraft. In addition to reducing the risk of controlled flight into terrain (CFIT) it is intended that an SVS meeting this MASPS will reduce the risk of loss-of-control inflight (LOC-I) accidents by preventing the attainment of any unusual (i.e., not normal) attitude and/or energy states that could result in a LOC-I.

> ***Note:*** *The Commercial Aviation Safety Team (CAST) chartered the ASA Joint Safety Analysis Team in 2010 to investigate LOC-I accidents and incidents in which the flightcrew lost awareness of the airplane's attitude and/or energy state. 274 intervention strategies (IS) were identified as mitigations to the standard problems observed in the LOC-I accident analysis. The CAST ASA Joint Safety Intervention Team reviewed the IS and developed 11 new safety enhancements (SE) including training, operations and design implementations. This MASPS was created in support of the desire to provide an industry standard for SE-200: Virtual day visual meteorological condition (VMC) displays (such as synthetic vision or an equivalent system) with energy state symbology cues. While SE-200 was identified as the highest rated design intervention in terms of risk reduction percentage. it is recognized that there exist many other impactful design interventions for reducing LOC-I that are not covered in this MASPS, e.g., Bank Alerting with Recovery Guidance (SE-201), Bank Angle Protection (SE-202), and Low Speed Alerting (SE-192).*

1.1.2 Structure of the Document

Section 1 provides an explanation of the scope and purpose of this document and introduces the ASA SVS.

