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Operational Services and Environmental Definition (OSED) for Unmanned Aircraft Systems (UAS)

RTCA DO-320
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FOREWORD

This document was prepared by "Special Committee 203 (SC-203) and approved by the RTCA Program Management Committee (PMC) on June 10, 2010.

RTCA, Incorporated is a not-for-profit corporation formed to advance the art and science of aviation and aviation electronic systems for the benefit of the public. The organization functions as a Federal Advisory Committee and develops consensus based recommendations on contemporary aviation issues. RTCA objectives include, but are not limited to:

- Coalescing aviation system user and provider technical requirements in a manner that helps government and industry meet their mutual objectives and responsibilities;
- Analyzing and recommending solutions to the system technical issues that aviation faces as it continues to pursue increased safety, system capacity and efficiency;
- Developing consensus on the application of pertinent technology to fulfill user and provider requirements, including development of Minimum Operational Performance Standards (MOPS) for electronic systems and equipment that support aviation; and
- Assisting in developing the appropriate technical material upon which positions for the International Civil Aviation Organization (ICAO) and the International Telecommunication Union (ITU) and other appropriate international organizations can be based.

The recommendations of RTCA are often used as the basis for government and private sector decisions as well as the foundation for many Federal Aviation Administration Technical Standard Orders (TSO).

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Table of Contents

List of Figures

List of Tables

1 Introduction

1.1 Purpose

The purpose of the Operational Services & Environment Definition (OSED) is to provide a basis for assessing and establishing operational, safety, performance, and interoperability requirements for UAS operations in the NAS. Its contents are based on guidance contained in RTCA DO-264, *Guidelines for Approval of the Provision and Use of Air Traffic Services Supported by Data Communications*. Though DO-264 is specific to data communications, it provides a generic framework and process being followed by SC-203 in accordance with their Terms of Reference. As stated in DO-264, the OSED results from the Operational Services Environmental Information Capture (OSEIC) process. Information from the OSEIC is used to provide a description of operational objectives, stakeholders, air traffic services, and operational environment.

Traditionally, OSEDs have been written for specific applications whose breadth of operational function and environmental interactions with the NAS are limited (e.g., ADS-B). Such applications have generally sought to *augment or replace* capabilities within the NAS. In contrast, UAS applications are intended to *integrate* into the NAS, not to modify fundamentals of its infrastructure or procedures. Further, unlike the well-defined and limited applications found in other OSED's, UAS vary widely in design, concept, use, and interact with virtually all services, infrastructure and users of the NAS. This document seeks to characterize those highly differentiated attributes of UAS and define their relationship to airspace users, air traffic services, and operating environments of the NAS. It is a baseline information source intended to support subsequent assessments leading to the development of Operational, Safety, Performance and Interoperability Requirements (OSPIR) which, in turn, will support development of UAS Minimum Aviation System Performance Standards (MASPS), and specific Sense & Avoid (SAA) MASPS, and Control & Communication (C2) MASPS.

Specific objectives of the OSED are to:

- Characterize UAS operations in the NAS, with emphasis on civil applications
- Identify where UAS share similar issues with manned aviation in the NAS
- Characterize the operational environment of UAS with respect to airspace classes, operating rules and conditions, and the nature of interactions with other airspace users
- Categorize UAS based on attributes of greatest interest to the NAS
- Provide a basis for identifying specific incompatibilities with the current NAS in terms of operations, systems, standards and procedures, or some combination thereof
- Articulate differences in UAS operations relative to NAS constraints and requirements
- Map UAS operational functions and interfaces relative to the NAS
- Identify where additional research or data may be required to effectively describe and characterize the nature of UAS/NAS incompatibilities
- Provide source data for assessing the scope of operations and environments to be considered for the initial set of MASPS development work

The OSED is an iterative document that is subject to change based on modifications to underlying data or descriptions (e.g., implementation of new air traffic procedures or technologies) or the need for additional information to support future assessments.