RTCA, Inc.
1828 L Street, NW, Suite 805
Washington, DC 20036-5133 USA

Safety and Performance Requirements (SPR)
for
Aeronautical Information Services (AIS)
and
Meteorological (MET) Data Link Services

RTCA DO-324
December 8, 2010

Prepared by: SC-206

FOREWORD

This document was prepared in joint session as part of RTCA Special Committee 206 (SC-206) and EUROCAE Working Group 76 (WG-76). It was approved by the RTCA Program Management Committee (PMC) on December 8, 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's 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 technologies to fulfill user and provider requirements, including development of minimum operational performance standards 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 and the International Telecommunication Union and other appropriate international organizations can be based.

The organization's recommendations 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.

Since RTCA is not an official agency of the United States Government, its recommendations may not be regarded as statements of official government policy unless so enunciated by the U.S. government organization or agency having statutory jurisdiction over any matters to which the recommendations relate.

This page intentionally left blank

PREFACE

This document specifies minimal baseline operational, safety and performance requirements for the data link delivery of AIS and MET information as the primary means of communications between the air and the ground. The aim of the AIS and MET data link services is to provide aeronautical and meteorological information for flight efficiency and/or hazard avoidance in all flight environments.

Key components of Next Generation Air Transportation System (NextGen) and Single European Sky Air Traffic Management Research (SESAR) ATM future concepts are data sharing and collaborative decision making (CDM). In NextGen and SESAR, the traditional product-centric provision of aeronautical and weather information will be replaced by data-centric and service-oriented architecture systems. Providing timely (and continuous) updates of data-centric information will facilitate the creation of a common picture of the airspace situation for all involved in the planning and execution of flights (e.g. pilots, controllers, dispatchers). It is expected there will be an increased need for information on the flight deck that can be integrated into flight decision support tools and/or visualized on systems such as the Navigation Display or Electronic Flight Bags.

Achieving the goal of AIS and MET data link services will be evolutionary. The feasibility of providing timely updates from dynamic digital AIS and MET data has already been partly demonstrated through projects like the European and US Digital NOTAM systems, the developing SESAR and NextGen Four Dimensional Weather Cube and by the Digital Aeronautical Information Management (D-AIM) project conducted by LFV (Luftfartsverket) Sweden and EUROCONTROL.

This document is based on the joint RTCA DO-308/EUROCAE ED-151 document, "Operational Services and Environment Definition (OSED) for Aeronautical Information Services (AIS) and Meteorological (MET) data link services." It was developed jointly by RTCA Special Committee 206 and EUROCAE Working Group 76 and follows the criteria for SPR documents set forth in RTCA DO-264/EUROCAE ED-78A, "Guidelines for Approval of the Provision and Use of Air Traffic Services Supported by Data Communications." In addition to the qualitative safety assessment methodology in RTCA DO-264/EUROCAE ED-78A, a quantitative safety assessment has been performed to meet the requirements of the EUROCONTROL Safety Regulatory Requirement ESARR 4, "Risk Assessment and Mitigation in ATM". The Operational Performance Analysis and resulting performance requirements were determined through the application of the Required Communications Performance (RCP) approach and a comparison with other services within the DFIS application.

Four AIS/MET data link services are covered in this SPR: an aeronautical update service that provides current updates of aeronautical information; and three weather decision services that provide current updates of meteorological information designed to support flight crew decisions in three time categories (planning, near term and immediate decisions). While the data elements and the intended uses of the AIS and MET data differ, there are many common features related to the operating methods for the AIS and MET data link services. The common and specific features of the four AIS/MET data link services are described in Section 4. A summary of the SPR requirements and recommendations is provided in Section 5.

This document is based on a notional architecture and is not intended for implementation and operational use until validation activities are completed. It provides a framework and a methodology to be used as the basis for assessing implementation of new data link systems or architectures as candidates for AIS and/or MET data link services.

This page intentionally left blank

TABLE OF CONTENTS

This page intentionally left blank

1 INTRODUCTION

Note:

This document has been developed to support user and provider validation activities associated with the data communications needs of future Air Traffic Management concepts e.g, Next Generation Air Transportation System (NextGen) and Single European Sky Air Traffic Management Research (SESAR) initiatives. A key component of NextGen and SESAR ATM future concepts is data sharing and collaborative decision making (CDM). The traditional product-centric provision of aeronautical and weather information will be replaced by data-centric and service-oriented architecture systems. Providing timely (and continuous) updates of data-centric information will facilitate the creation of a common picture of the airspace situation for all involved in the planning and execution of flights (e.g. pilots, controllers, dispatchers). It is expected there will be an increased need for information on the flight deck that can be integrated into flight decision support tools and/or visualized on displays such as the Navigation Display or Electronic Flight Bags (EFB).

This document specifies safety and performance requirements for the data link delivery of AIS and MET information that is the primary means of communications between the air and the ground. The application of the AIS and MET information supports tactical as well as strategic decisions. The safety and performance analyses in this specification assume that voice is the secondary means of communication and is one of many mitigation means for failures of the data link service.

This document is based on a notional data link architecture. It is NOT intended for implementation and operational use until validation activities are completed based on candidate implementation data communications architectures. The methodology in this document can be used to support the intermediate application of AIS and MET data link services subject to revalidation of the assumptions and the environments described herein.

This document establishes the baseline operational, Safety, and Performance Requirements (SPR) for the implementation of Aeronautical Information Services (AIS) and Meteorological (MET) data link services as described in the joint RTCA DO-308 / EUROCAE ED-151 document, "Operational Services and Environment Definition (OSED) for Aeronautical Information Services (AIS) and Meteorological (MET) data link services" [Ref. 1.]. In this document focus is on the uplink of AIS (Aeronautical Updates) and MET data in managed continental airspace (Environment Description 1 – ED1) and unmanaged airspace (Environment Description 2 – ED2) as described in Section 3. The other AIS/MET data link services described in the OSED are deferred for consideration by appropriate committees; specifically the baseline synchronization of aircraft AIS databases by data link as well as the downlink and crosslink of MET data.

This document establishes the requirements for providing timely updates of AIS and MET information from dynamic digital data . That dynamic data could be in the form of full featured product delivery, in the form of composable data elements, or any combination depending on the individual architecture employed. The feasibility of such an approach has already been partly demonstrated through projects like the European and US Digital NOTAM systems, the developing SESAR and NextGen Four Dimensional Weather Cube and by the Digital Aeronautical Information Management (D-AIM) project conducted by LFV (Luftfartsverket) Sweden and EUROCONTROL.