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Next Generation Air/Ground Communication System (NEXCOM) Safety and Performance Requirements (SPR)

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Prepared by SC-198
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FOREWORD

This report was prepared by RTCA Special Committee 198 and approved by the RTCA Program Management Committee (PMC) on January 23, 2003.

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 technology 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 the 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.

EXECUTIVE SUMMARY

This Government/Industry NEXCOM Safety and Performance Requirements (SPR) document identifies the operational safety and performance requirements for air traffic services supported by digital voice and data communications in the U.S. National Airspace System (NAS).

Note: The requirements in this document represent the best engineering judgement that can be derived from available data, and are intended to provide guidance for initial NEXCOM implementation activities. As the community and industry gather more data, and initial operational experience, this document will be updated as necessary.

The NEXCOM SPR provides a brief description of digital voice and data services for the systems' users. Data communications requirements were developed by RTCA SC-189/EUROCAE WG-53. On publication of RTCA SC-189/EUROCAE WG-53's Initial Continental SPR (ICSPR), this document will be updated as required to include those data requirements applicable to the NAS.

Background

The demand for air traffic services within the national airspace is projected to rise sharply in the 21st century. Air traffic management depends on timely and accurate communications of information during all segments of the flight (gate to gate). Modernization of today's air/ground communications is necessary to replace outdated hardware, to leverage VDL Mode 3 technology to expand the Very High Frequency (VHF) spectrum capacity, and to integrate both voice and data into a seamless network using digital technology. During the programmed transition period, NEXCOM will continue to support existing A/G communications systems using the analog capability of the Multimode Digital Radio (MDR). The NAS will migrate to a digital telecommunications infrastructure to take advantage of new technology and the growing number of digital services. The new telecommunications infrastructure will continue to support current analog voice switches and legacy protocols, and Emergency services will remain as an analog capability to ensure the widest information dissemination to other aircraft in the vicinity of the emergency aircraft.

The SPR document defines the operational safety hazards and performance requirements of the NEXCOM system (both airborne and ground subsystems). The SPR will be used to coordinate safety objectives and to allocate performance requirements for the system. It has been developed using the NEXCOM Operational Safety Assessment (OSA) and the NEXCOM Operational Performance Assessment (OPA). These two assessments define the safety functions, performance expectations, and characteristics of the operational environments needed to support the Air Traffic Services (ATS) identified in the NEXCOM Operational Services and Environment Definition (OSED). The SPR document identifies the objectives and allocated requirements (including substantiation) for a specific operation. The SPR provides traceability of each requirement to its source, and operating environments described in the OSED. RTCA DO-279, *Next Generation Air/Ground Communications System (NEXCOM) Principles of Operation VDL Mode 3*, serves the function of the OSED as described in RTCA DO-264.