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Minimum Operational Performance Standards for Airborne Radar Approach and Beacon Systems for Helicopters

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D E D I C A T I O N

By formal resolution of the RTCA Executive Committee on June 1, 1979, this document is dedicated to A. Rufus Applegarth, Chairman of Special Committee 133 from January 28, 1977 to May 10, 1979. Mr. Applegarth, a staunch supporter of the principles and activities of the Radio Technical Commission for Aeronautics for over thirty years, passed away on May 10, 1979. He is remembered by the members of this Special Committee, and by all those who knew him, for his many significant contributions and accomplishments, and for his innovative and dynamic leadership in the aeronautical community.

F O R E W O R D

This document was prepared by Special Committee 133, of the Radio Technical Commission for Aeronautics (RTCA). It was approved by RTCA on November 19, 1980.

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1.0 PURPOSE AND SCOPE

1.1 Introduction

This document sets forth Minimum Operational Performance Standards (MOPS) for Airborne Radar Approach (ARA) systems based on operational requirements of helicopters in the approach, missed approach and departure modes, particularly during Instrument Flight Rules (IFR), Instrument Meteorological Conditions (IMC) and at night. Included in this document are those system characteristics pertinent to the airborne equipment and to the ground-based radar beacon for those operations requiring such equipment. Operational goals have been established based on future requirements and technology, rather than merely repeating current state-of-the-art criteria.

Section 1.0 of this document is intended to be tutorial in nature and provides information needed to understand the rationale for equipment characteristics and requirements stated in the remaining sections. It describes typical equipment applications and operational goals, as envisioned by the members of Special Committee 133, and is the basis for the standards stated in Sections 2.0 through 5.0. Assumptions essential to proper understanding of this document are also provided in Section 1.0.

Section 2.0 contains the minimum performance standards for the airborne equipment. These standards define the required performance under standard operating conditions and stressed physical environmental conditions. It also details the recommended bench test procedures necessary to demonstrate compliance.

Section 3.0 contains the minimum performance standards for the ground beacon equipment. These standards define required performance under standard operating conditions and stressed physical environmental conditions. It also details the recommended bench test procedures necessary to demonstrate compliance.

Section 4.0 describes the performance required of the installed equipment. Installed equipment tests are included when performance cannot be adequately determined through bench testing.

Section 5.0 describes the operational characteristics for equipment installations and defines conditions that will assure the operator that operations can be conducted safely and reliably in the expected operational environment.

In the establishment of ARA equipment requirements, the inclusion of color was not considered to be a minimum requirement for the radar display element. However, it was recognized that the state of the art of both technology and

product development is such that many ARA displays may, either now or in the future, include color capability. Color characteristics for this application are not established in in this document.

For the purposes of this document, the following ARA applications will be considered in the context of helicopter operations:

a. Operations at offshore oil rigs, production platforms and surface vessels

b. Operations at surface heliports, including dedicated helipads at conventional airports

c. Operations at elevated heliports

d. Operations in remote land areas without necessarily having a prepared heliport

e. Operations at disaster areas.

Compliance with these standards by manufacturers, installers and users is recommended as a means of assuring that the equipment will satisfactorily perform its intended function(s) under all conditions normally encountered in routine aeronautical operations.

It is recognized that any regulatory application of these standards is the responsibility of appropriate governmental agencies.

The word "equipment" as used herein includes all components or units necessary (as determined by the manufacturer or installer) for the equipment to properly perform its function(s). For example, the airborne radar "equipment" may include an antenna, antenna mounting, a receiver/transmitter unit, a control/display unit, shock mount, etc. In the case of this example, all of the foregoing components or units comprise the "equipment." It should not be inferred from this example that every equipment configuration will necessarily include all of the foregoing components or units. This will depend on the design used by the equipment manufacturer.

1.2 Operational Goals

Due to lack of electronic elevation information and positive course guidance, the basic system goal is a "non-precision" instrument approach. An airborne radar instrument approach to the landing area (LA) may be augmented by other aids, such as beacons, reflectors, radio altimeters and lights, to provide minimums equivalent to those attainable by a "precision" approach system.