GUIDANCE FOR TOOL AND TEST EQUIPMENT (TTE) EQUIVALENCY

ARINC REPORT 668-1

PUBLISHED: June 18, 2013

AN ARINC DOCUMENT

Prepared by AMC
Published by
AERONAUTICAL RADIO, INC.
2551 RIVA ROAD, ANNAPOLIS, MARYLAND 21401-7435

DISCLAIMER

THIS DOCUMENT IS BASED ON MATERIAL SUBMITTED BY VARIOUS PARTICIPANTS DURING THE DRAFTING PROCESS. NEITHER AEEC, AMC, FSEMC NOR ARINC HAS MADE ANY DETERMINATION WHETHER THESE MATERIALS COULD BE SUBJECT TO VALID CLAIMS OF PATENT, COPYRIGHT OR OTHER PROPRIETARY RIGHTS BY THIRD PARTIES, AND NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, IS MADE IN THIS REGARD.

ARINC INDUSTRY ACTIVITIES USES REASONABLE EFFORTS TO DEVELOP AND MAINTAIN THESE DOCUMENTS. HOWEVER, NO CERTIFICATION OR WARRANTY IS MADE AS TO THE TECHNICAL ACCURACY OR SUFFICIENCY OF THE DOCUMENTS, THE ADEQUACY, MERCHANTABILITY, FITNESS FOR INTENDED PURPOSE OR SAFETY OF ANY PRODUCTS, COMPONENTS, OR SYSTEMS DESIGNED, TESTED, RATED, INSTALLED OR OPERATED IN ACCORDANCE WITH ANY ASPECT OF THIS DOCUMENT OR THE ABSENCE OF RISK OR HAZARD ASSOCIATED WITH SUCH PRODUCTS, COMPONENTS, OR SYSTEMS. THE USER OF THIS DOCUMENT ACKNOWLEDGES THAT IT SHALL BE SOLELY RESPONSIBLE FOR ANY LOSS, CLAIM OR DAMAGE THAT IT MAY INCUR IN CONNECTION WITH ITS USE OF OR RELIANCE ON THIS DOCUMENT, AND SHALL HOLD ARINC, AEEC, AMC, FSEMC AND ANY PARTY THAT PARTICIPATED IN THE DRAFTING OF THE DOCUMENT HARMLESS AGAINST ANY CLAIM ARISING FROM ITS USE OF THE STANDARD.

THE USE IN THIS DOCUMENT OF ANY TERM, SUCH AS SHALL OR MUST, IS NOT INTENDED TO AFFECT THE STATUS OF THIS DOCUMENT AS A VOLUNTARY STANDARD OR IN ANY WAY TO MODIFY THE ABOVE DISCLAIMER. NOTHING HEREIN SHALL BE DEEMED TO REQUIRE ANY PROVIDER OF EQUIPMENT TO INCORPORATE ANY ELEMENT OF THIS STANDARD IN ITS PRODUCT. HOWEVER, VENDORS WHICH REPRESENT THAT THEIR PRODUCTS ARE COMPLIANT WITH THIS STANDARD SHALL BE DEEMED ALSO TO HAVE REPRESENTED THAT THEIR PRODUCTS CONTAIN OR CONFORM TO THE FEATURES THAT ARE DESCRIBED AS MUST OR SHALL IN THE STANDARD.

ANY USE OF OR RELIANCE ON THIS DOCUMENT SHALL CONSTITUTE AN ACCEPTANCE THEREOF “AS IS” AND BE SUBJECT TO THIS DISCLAIMER.

ARINC REPORT 668-1

GUIDANCE FOR TOOL AND TEST EQUIPMENT (TTE) EQUIVALENCY

Published: June 18, 2013

Prepared by the AMC

Report 668	Adopted by the AMC Steering Group	December 6, 2002

Summary of Document Supplements

Supplement	Adoption Date	Published
Report 668-1	April 21, 2013	June 18, 2013

A description of the changes introduced by each supplement is included at the end of this document.

FOREWORD

Aeronautical Radio, Inc., the AEEC, and ARINC Standards

ARINC organizes aviation industry committees and participates in related industry activities that benefit aviation at large by providing technical leadership and guidance. These activities directly support aviation industry goals: promote safety, efficiency, regularity, and cost-effectiveness in aircraft operations.

ARINC Industry Activities organizes and provides the secretariat for international aviation organizations (AEEC, AMC, FSEMC) which coordinate the work of aviation industry technical professionals and lead the development of technical standards for airborne electronic equipment, aircraft maintenance equipment and practices, and flight simulator equipment used in commercial, military, and business aviation. The AEEC, AMC, and FSEMC develop consensus-based, voluntary standards that are published by ARINC and are known as ARINC Standards. The use of ARINC Standards results in substantial technical and economic benefit to the aviation industry.

There are three classes of ARINC Standards:

a) ARINC Characteristics – Define the form, fit, function, and interfaces of avionics and other airline electronic equipment. ARINC Characteristics indicate to prospective manufacturers of airline electronic equipment the considered and coordinated opinion of the airline technical community concerning the requisites of new equipment including standardized physical and electrical characteristics to foster interchangeability and competition.

b) ARINC Specifications – Are principally used to define either the physical packaging or mounting of avionics equipment, data communication standards, or a high-level computer language.

c) ARINC Reports – Provide guidelines or general information found by the airlines to be good practices, often related to avionics maintenance and support.

The release of an ARINC Standard does not obligate any organization or ARINC to purchase equipment so described, nor does it establish or indicate recognition or the existence of an operational requirement for such equipment, nor does it constitute endorsement of any manufacturer's product designed or built to meet the ARINC Standard.

In order to facilitate the continuous product improvement of this ARINC Standard, two items are included in the back of this volume:

An Errata Report solicits any corrections to existing text or diagrams that may be included in a future Supplement to this ARINC Standard.

An ARINC IA Project Initiation/Modification (APIM) form solicits any proposals for the addition of technical material to this ARINC Standard.

APPENDICES

1.0 INTRODUCTION

1.1 Overview

Industry standards documents and regulatory agencies have long provided for the use of equivalent alternatives in lieu of an Original Equipment Manufacturer's (OEM's) recommended tool and test equipment (TTE) and related procedures. They have not, however, provided significant guidance as to what constitutes this equivalency. In general, functional equivalency constitutes a task implementation that results in the same or better results using alternative equipment as when using equipment recommended by the OEM. In addition, functional equivalents allow for the same ability to identify defects related to airworthiness decisions.

In the absence of any significant industry standard or guidance, each airline and repair station has had to derive their own procedures to develop and document the functional equivalencies they have employed. The variety of processes and documentation has led to uncertain results from regulatory agency reviews and, in many instances, significant work and rework by airlines and repair stations to meet regulatory agency requirements.

1.2 Purpose of the Document

The goals of ARINC 668 are:

- To provide uniform guidance for airlines and repair stations in developing their processes and documentation for determining functional equivalency of TTE and related procedures used in maintaining aircraft and their associated components. This applies to both generic and application specific equipment.
- To define the roles and responsibilities for the organizations involved.

TTE is defined as any tooling, test apparatus, or other device that provides a means of testing, measuring, or aiding in maintaining aircraft or components during maintenance procedures as outlined and required by a controlling document.

1.3 Reason for Revision

The original ARINC 668 document was released January 24, 2003. Subsequently, associated processes for TTE equivalency substantiation have been successfully implemented globally throughout the air transport industry.

Feedback from the industry revealed significant time-consuming work is necessary for equivalency substantiation of TTE.

Proposals were made to consider the individual tasks within Maintenance Service Documents (MSD) whenever TTE is specified. It was felt that TTE used during troubleshooting and repair or to facilitate maintenance would not need the same level of substantiation to establish equivalency as TTE used for Return to Service Tests (RTS). Therefore, TTE substantiation effort could be reduced for tasks not directly tied to airworthiness determination.

1.4 Scope

This document provides guidelines for the process used to establish the equivalency of TTE and related procedures other than that recommended by the OEM. Figure 1