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Aerospace series - General recommendation for the BIT Architecture in an integrated system

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Série aerospatiale - Recommandations générales pour l'architecture des BIT dans un système intégré

Luft- und Raumfahrt - Allgemeine Empfehlungen für die integrierte Prüfungs-(BIT)-Architektur in einem integrierten System

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European foreword

This document (EN 9721:2021) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Introduction

A Built-in-test (*BIT*) is a test carried out exclusively with the hardware and software resources specific to an item of equipment/system, in order to test it and/or its sub-assemblies, in view of detecting failures and isolating or even diagnosing them.

System designers are faced with the following questions:

— How do you define a strategy or method for a test built into a system?

— How do you assess the operational efficiency of a system's *BIT* architecture? (False alarms, non-reproducible alarms and false removals)

— How do you obtain a coherent *BIT* architecture between the various levels of a system? of a system of systems?

— How do you take into account the needs of the various users of the *BIT* function bearing in mind that the implementation, accesses, *BIT* reports, etc. are specific to the users?

1 Scope

The purpose of this document is to harmonise the dialogue between manufacturers, prime contractors, owners and the customer in view of making it easier to draw up specifications, share BIT architecture models and the *BIT* technical configuration of systems during the operational use phase.

This recommendation proposes adopting *BIT* operational efficiency and performance definitions, architecture design principles, and *BIT* specification or validation principles. It provides no recommendations regarding the numeric values for operational efficiency or performance. The diversity of situations, development of technological solutions and ever-changing operational requirements make it impossible to list general recommendations.

Clause 6 and Clause 9 set out the general context of use of the *BIT*.

Clause 7 lists the constraints to be taken into account to design a *BIT* architecture.

Clause 8 lists the various *BIT* types currently known and the definitions of performance and operational efficiency (metrics).

Clause 10 provides recommendations on the *BIT* architecture.

Clause 11 recommends a language for exchanging *BIT* architecture models for assembling the complete model of a system.

Clause 12 is an introduction to the prognosis.

This document is mainly intended for system designers.

Although it is based on examples of aeronautic systems, it is applicable to any type of system.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5577, *Non-destructive testing — Ultrasonic testing — Vocabulary*