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(R) Structural Design and Construction Considerations for Enclosed Turbofan/Turbojet Engine Test Cells

RATIONALE

Update for code references or removal of dates as applicable to publishing standards. Addition of new design considerations and engine thrust class.

FOREWORD

This document discusses the structural design and construction considerations for design of structures used for testing turbofan and turbojet engines. The document presents general design and construction information along with information for limiting damage and injuries from projectiles.

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1. SCOPE

This SAE Aerospace Recommended Practice (ARP) is written for individuals associated with the ground-level testing of large and small gas turbine engines and particularly for those who might be interested in constructing new or adding to existing engine test cell facilities.

1.1 Purpose

The purpose of this document is to provide general guidelines for the design and construction of concrete test cell structures that will resist the effects of normal engine operating loads, dynamic loads due to engine failure, over pressures and cell depression loads, acoustic and environmental loads and engine projectiles.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Coomonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

2.1.1.1 AIR4869 Design Considerations for Enclosed Turbofan/Turbojet Engine Test Cells

2.1.1.2 AS567 Safety Cable, Safety Wire, Key Washers, and Cotter Pins for Propulsion Systems, General Practices for Use Of

2.1.2 AIA Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

2.1.2.1 NASM33540 Safety Wiring, Safety Cabling, Cotter Pinning, General Practices for

2.1.2.2 NASM21045 Nut, Self-locking, Hexagon, Regular Height, 450° F, 125 ksi Ftu

2.1.3 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

2.1.3.1 DOT/FAA/AR-99/71 Full-Scale Tests of Lightweight Fragment Barriers on Commercial Aircraft

2.1.3.2 DOT/FAA/AR-99/8, I Improved Barriers to Turbine Engine Fragments: Interim Report I

2.1.3.3 DOT/FAA/AR-99/8, II Improved Barriers to Turbine Engine Fragments: Interim Report II

2.1.3.4 DOT/FAA/AR-99/8, III Improved Barriers to Turbine Engine Fragments: Interim Report III

2.1.3.5 DOT/FAA/AR-99/8, IV Improved Barriers to Turbine Engine Fragments: Interim Report IV