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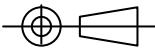
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RELIABILITY DEMONSTRATION OF
SOLID PROPELLANT ROCKET MOTORS

FOREWORD

During the past decade, reliability has emerged as a quantitative system characteristic associated with the design and performance of solid propellant rocket motors. Reliability, expressed as a quantitative value, serves as a requirement toward which motor designs are directed prior to testing and as a basis for measuring at intermediate points during the development program. There are two aspects to the reliability measurement task: technical and management. This document presents a uniform method for accomplishing both.

The System Program Director and the contractor need the timely and accurate measurement of reliability early in a development program.

This standard fulfills these needs by establishing ground rules for procedures and statistical techniques applicable to the systematic and orderly performance of reliability assessment and demonstration functions.

The reliability model for a solid propellant rocket motor represents an independent serial system with respect to the motor subassemblies. These subassemblies, some of which operate concurrently and other sequentially, must be successful before a mission can be successfully accomplished.

Thus, the statistical model recommended by this standard is based on the binomial distribution and is designed to estimate system reliability from data generated at the subsystem level. This technique has previously been applied to large solid propellant missile programs and has demonstrated valid reliability estimates. This standard provides for the use of alternate statistical techniques when the contractor can technically support its use and the systems management approves its use.

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No.	Rev.	No.	Rev.	No.	Rev.
1	NEW	5	NEW	9	NEW
2	NEW	6	NEW	10	NEW
3	NEW	7	NEW	11	NEW
4	NEW	8	NEW	12	NEW

CUSTODIAN: RELIABILITY COMMITTEE

PROCUREMENT
SPECIFICATION

NONE

TITLE
RELIABILITY DEMONSTRATION OF
SOLID PROPELLANT ROCKET MOTORS

CLASSIFICATION
STANDARD PRACTICE

AVIA Documents
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SHEET 1 OF 12
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1.0 SCOPE

1.1 Purpose

The standard specifies reliability estimation and demonstration guidelines for solid rocket motors.

1.2 Application

The general requirements and reliability demonstration techniques described herein should be the principal basis for estimating solid rocket motor reliability. Specific demonstration requirements may be included in the request for proposal, work statement, or other contractual document. As an option of the procuring activity, a specific demonstration plan for the proposed system may be prepared by the contractor as part of the reliability program plan.

This standard applies primarily to large solid rocket motors. It may be adapted for other applications as an option of the contractor and procuring activity.

2.0 REFERENCED DOCUMENTS

2.1 Appendix 1 herein lists several useful references. The current issues of the following documents form a part of this standard practice to the extent specified herein:

2.1.1 Governmental

MIL-STD-721, Definition of Effectiveness Terms

2.1.2 Non-Governmental

References No. 1 and No. 13 listed in Appendix 1 herein.

3.0 DEFINITIONS

3.1 The definitions of MIL-STD-721 apply.

4.0 GENERAL REQUIREMENTS

4.1 Motor Demonstration

The reliability demonstration methods outlined herein encompass the use of test data from the following typical sources:

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