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SURFACE VEHICLE/ AEROSPACE STANDARD

SAE JA1000

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An American National Standard

Reliability Program Standard

Foreword—In June of 1995 the SAE G-11 Reliability, Maintainability, Supportability, and Logistics (RMSL) Division standards section chartered a subcommittee to create a reliability program standard. The subcommittee was comprised of representatives from industry, government, and academia. In response to that charter, this standard has been developed.

The subcommittee has endeavored to develop a standard that would reflect current commercial practices and meet the objectives of the United States Department of Defense Acquisition Reform initiative. This performance based standard was developed in recognition of today's intense and competitive market demands for high reliability, affordability, and speed to market.

This document relies heavily upon the supplier-customer dialogue, and it intentionally allows suppliers great freedom to uniquely tailor reliability programs. However, it was recognized that, in addition to the requirements of this document, guidance for developing reliability programs is frequently required. Consequently, the subcommittee has also been chartered to produce an implementation guide (SAE JA1000-1). The implementation guide describes methods that may be used to satisfy the requirements of this standard. In addition, the standard and implementation guide are intended to become part of a set of comprehensive RMSL Standards planned by the G-11 Division to replace selected Military Standards and Specifications.

The professionals in the subcommittee gratefully acknowledge the support from their companies, and from many individuals and organizations.

1. Scope

1.1 Purpose—This SAE standard establishes the requirement for suppliers to plan a reliability program that satisfies the following three requirements:

   a. The supplier shall ascertain customer requirements
   b. The supplier shall meet customer requirements
   c. The supplier shall assure that customer requirements have been met

1.2 Applicability—This document applies to the specification, design and development, and assurance of any product.

1.3 Tailoring—This document does not specify the methods to be included in the program. Rather, the content of each program must be tailored to satisfy customer requirements using the most appropriate means.

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2.   References

2.1   Applicable Publications—The following publication forms a part of this specification to the extent specified herein. Unless otherwise indicated, the latest version of SAE publications shall apply.

2.1.1   SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

> SAE JA1000-1—Reliability Program Standard, Implementation Guide.
> The Reliability Program Standard Implementation Guide describes methods that may be used to satisfy the requirements of this document. Although the Guide has been designed for use with this document, it is not required.

3.   Definitions

3.1   Activity—A defined action that uses one or more methods to satisfy a reliability program requirement

3.2   Customer—The recipient of a product (e.g., the customer may be the purchaser, beneficiary, ultimate consumer, or user).

3.3   Life Cycle—A series of stages a product passes through during its lifetime.

3.4   Method—A standardized procedure to accomplish a particular activity.

3.5   Product—Hardware, software, or any combination thereof.

3.6   Qualification—Action(s) that constitutes formal evidence that a product or process has met its requirements .

3.7   Reliability—The ability of a product to perform a required function, under stated conditions, for a stated period of time.

3.8   Requirement

> a.   Customer Requirements—The expressed or inferred needs and wants that a customer desires from a product.
> b.   Product Requirements—Acceptable levels of specific performance parameters for a given set of conditions.
> c.   Program Requirements—The three requirements identified in 1.1.

3.9   Resources—The means available to an organization for developing a product, including materials, facilities, people, capital, time, equipment, hardware, and software.

3.10   Supplier—An organization that provides a product to a customer.

4.   Program Requirements

4.1   The Supplier Shall Ascertain Customer Requirements—The reliability program shall contain the following activities to ensure that customer requirements are fully understood and defined.

4.1.1   ESTABLISH SUPPLIER-CUSTOMER DIALOGUE—A supplier-customer dialogue shall be initiated to establish mutually understood requirements, and shall continue throughout the program. The supplier is responsible to ascertain customer requirements. The customer should provide initial product requirements to the supplier. Where requirements are not known, assumptions of requirements shall be made by the supplier, verified by the customer, and mutually agreed upon.

4.1.2 IDENTIFY CONDITIONS OF USE—The supplier, with input from the customer, shall identify relevant product usage profiles and environmental conditions for all stages of the product life cycle.

4.1.3 DEFINE MAINTENANCE AND SERVICE—The supplier and customer shall mutually agree upon any maintenance and service requirements.

4.1.4 ESTABLISH METRICS—Metrics which assess the ability of the product to meet customer requirements shall be identified by the supplier and agreed upon by the customer. These metrics shall be tracked throughout the program.

4.1.5 DEVELOP PRODUCT SPECIFICATION—The supplier and customer shall mutually agree upon a product specification which adequately reflects the intended performance and use of the product.

4.2 The Supplier Shall Meet Customer Requirements—The reliability program shall contain the following activities to meet customer requirements by optimizing the product design for the identified application, within resource constraints.

4.2.1 CHARACTERIZE RESOURCES—The supplier shall identify the resources, including their capabilities, used in developing the product. The supplier and customer shall mutually agree upon the level of detail required to document resources.

4.2.2 ASSESS AND MANAGE RISK—On an ongoing basis, the supplier shall evaluate program risks and notify the customer. The supplier shall restructure the reliability program to reduce risks to a mutually acceptable level.

4.2.3 DESIGN TO ACHIEVE RELIABILITY—The supplier shall determine appropriate reliability design and development methods for the reliability program. When selecting methods, product performance, cost and schedule shall be considered.

4.3 The Supplier Shall Assure That Customer Requirements Have Been Met—The reliability program shall contain the following activities to assure that customer requirements have been met.

4.3.1 QUALIFY THE PRODUCT AND PROCESS—The supplier shall select appropriate methods for product and process qualification.

4.3.2 ESTABLISH PROCESS CONTROLS—Process monitors and controls shall be established to ensure conformance to requirements.

4.3.3 PURSUE CONTINUOUS IMPROVEMENT—Process improvement methods shall be established to continuously reduce variation.

4.3.4 ESTABLISH DATA COLLECTION AND REPORTING—The supplier and customer shall agree upon methods to continuously assess product quality, reliability and cost effectiveness.

*5. Program Elements—*The supplier shall prepare and implement a reliability program to satisfy the three requirements identified in 1.1. The reliability program shall be mutually agreed upon by the supplier and customer, and should include the following elements:

    a. Organization And Management

      1. Resource allocation (including planned customer supplied resources including proving grounds, test facilities, and product usage data)
      2. A means of reconciling issues when requirements are not met

b. Program Description

    1. Program Milestones (including interfaces with program management)
    2. Schedule/duration of the activities
    3. Reliability methods and metrics pertinent to each activity

c. Documentation

    1. Evidence that requirements have been met
    2. A record of the rationale for program changes

PREPARED BY THE SAE G-11 RELIABILITY PROGRAM STANDARD SUBCOMMITTEE
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