

Aerospace series - Quality management systems -
Variation management of key characteristics

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 9103:2015 sisaldab Euroopa standardi EN 9103:2014 ingliskeelset teksti.	This Estonian standard EVS-EN 9103:2015 consists of the English text of the European standard EN 9103:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.12.2014.	Date of Availability of the European standard is 17.12.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English Version

Aerospace series - Quality management systems - Variation management of key characteristics

Série aérospatiale - Systèmes de management de la qualité
- Management de la variation des caractéristiques clefs

Luft- und Raumfahrt - Qualitätsmanagementsystems -
Management der Veränderung der Haupteigenschaften

This European Standard was approved by CEN on 29 November 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Foreword

This document (EN 9103:2014) 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 Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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.

This document supersedes EN 9103:2005.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Rationale

This standard was revised to coincide with the updated information presented in the International Aerospace Quality Group (IAQG) 9100-series standards (i.e., 9100:2009, 9110:2009). All other changes made to standard requirements or methods presented herein were editorial in nature.

Foreword

To assure customer satisfaction, the aviation, space, and defence industry organizations must produce and continually improve safe, reliable products that meet or exceed customer and regulatory authority requirements. The globalization of the industry, and the resulting diversity of regional/national requirements and expectations, has complicated this objective. End-product organizations face the challenge of assuring the quality of, and integrating, product purchased from suppliers throughout the world and at all levels within the supply chain. Industry suppliers and processors face the challenge of delivering product to multiple customers having varying quality expectations and requirements.

The aviation, space, and defence industry established the International Aerospace Quality Group (IAQG) for the purpose of achieving significant improvements in quality and safety, and reductions in cost, throughout the value stream. This organization includes representation from companies in the Americas, Asia/Pacific, and Europe.

This document standardizes requirements for “Key Characteristic” (KC) identification, control, documentation, and approval for the industry. The establishment of common requirements, for use at all levels of the supply-chain by organizations, should result in improved quality and safety, and decreased costs, due to the elimination or reduction of organization-unique requirements and the resultant variation inherent in these multiple expectations.

INTRODUCTION

General

This standard establishes variation management requirements for KCs. The standard also specifies general requirements and provides a process to achieve those requirements.

The standard requires a thorough assessment of the applicable production/maintenance process with the primary goals being to control and minimize variation in characteristics generated by the process.

Specifically, the standard requires:

- Understanding process elements that affect KCs.
- Disciplined determination of process KCs using appropriate analysis tools for variation control and reduction to satisfy customer requirements.
- Control and capability assessment to ensure variation is well understood.
- Process Control Documents (PCDs) or equivalent documentation that defines specific control of KCs and manufacturing/maintenance process parameters.

This standard does not:

- Require rejection of any part that conforms to engineering specification.
- Inhibit shipment or use of product during production process capability assessment.

Although the 9103 standard is focused on variation control of KCs for production and maintenance activities, this process can also be used as a model for other characteristics, such as those that affect cost and delivery.

Application

This standard was created to provide for a uniform process for the identification, control, documentation, and approval of KCs when contractually invoked at any level or as guidance within the aviation, space, and defence industry in the control of Critical Items (CIs). This standard can be invoked as a stand-alone requirement or used in conjunction with 9100-series standards (i.e., 9100, 9110).

1 Scope

This standard is primarily intended to apply to new parts and products, but can also be applied to parts currently in production. The standard shall be applicable to all production processes that influence the variation of KCs, as well as maintenance processes in which KCs are identified. It applies to assemblies and all levels of parts within an assembly, down to the basic materials including castings and forgings, and to organizations that are responsible for producing the design characteristics of the product.

It does not apply to lab-scale, pilot, or pre-production processes. However, particular management of some KCs might be required using other methods than those described in the standard, during these phases of a programme, when required by the customer or deemed appropriate by the organization (e.g., Engineering department requirement).

The variation control process begins with product definition, typically an engineering drawing or specification which identifies KCs, and leads to a variation management program for those KCs. This process may also be used for producer-identified KCs.

Producers and their subcontractors shall be responsible for flow down of the requirements of the applicable revision of this standard to subcontractors, who produce design characteristics, and for ensuring that KCs conform to customer requirements.

1.1 Purpose

This standard is designed to drive the improvement of manufacturing and maintenance processes through adequate planning and effective management of KC variation. The KC focus is intended to improve confidence for part features whose variation has a significant influence on to end-product form, fit, performance, service life, and producibility.

NOTE Control of a product or process KC per this standard does not constitute, nor imply, acceptance of the resulting product. If variation management, under this standard, is to be part of an acceptance decision, the requirements must be specified in the applicable product acceptance plan or contract.

1.2 Convention

The following conventions are used in this standard:

- The words "shall", "will", or "must" indicate mandatory requirements.
- The word "should" indicates a requirement with some flexibility allowed in compliance methodology.
- Producers choosing other methods to satisfy a "should" shall be able to show that their approach meets the intent of the requirements of this standard.
- Words "typical", "example", "for reference", "may", or "e.g." indicate suggestions given for guidance only.
- "NOTES" are used for additional clarification.
- Words or phrases with specific meaning pertaining to this document are defined in Clause 3, Terms and Definitions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

AS 9100, *Quality management systems — Requirements for aviation, space and defence organization*

AS 9102, *Aerospace first article inspection requirement*

AS 9110, *Quality management systems — Requirements for aviation maintenance organization*

ISO 9000:2005, *Quality management systems — Fundamentals and vocabulary*

2.1 Related publications

The following publications are provided for information purposes only and are not a required part of this SAE Aerospace Technical Report.

ISO 9001:2008, *Quality management systems — Requirements*

ISO 9004:2009, *Managing for the sustained success of an organization — A quality management approach*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000 and the following apply.

3.1

Critical Item (CI)

those items (e.g., functions, parts, software, characteristics, processes) having significant effect on the product realization and use of the product; including safety, performance, form, fit, function, producibility, service life, etc.; that require specific actions to ensure they are adequately managed. Examples include safety CIs, fracture CIs, mission CIs, KCs, and maintenance tasks critical for safety.

3.2

customer

the organization which identifies CIs and/or provides part or system KCs via engineering drawings, specifications, or purchase order/contract requirements. For example, a customer may be an internal engineering department for a company which has design authority, in addition to the external customer who specifies system KCs.

3.3

Key Characteristic (KC)

an attribute or feature whose variation has a significant influence on product fit, performance, service life, or producibility; that requires specific action for the purpose of controlling variation (reference 9100 and 9110).

This definition is further explained as follows:

KCs for a part, subassembly, or system are those selected geometrical, material properties, functional, and/or cosmetic features; which are measurable, whose variation control is necessary in meeting customer requirements and enhancing customer satisfaction.