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Aerospace series – Programme Management – General guidelines for acquisition and supply of open systems

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The European Standard EN 9320:2014 has the status of a Swedish Standard. This document contains the official version of EN 9320:2014.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 9320

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English Version

Aerospace series - Programme Management - General guidelines for acquisition and supply of open systems

Série aérospatiale - Management de Programme - Recommandations générales pour l'acquisition et la fourniture de systèmes ouverts

Luft- und Raumfahrt - Programm-Management - Allgemeiner Leitfaden für Erwerb und Lieferung von offenen Systemen

This European Standard was approved by CEN on 28 June 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 9320:2014) 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of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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1 Scope

These general guidelines cover the open system acquisition and supply processes.

There is an increasing requirement for systems designed and produced by industry, particularly in the aeronautic, space and defence fields, to be used with other systems designed, produced, acquired and operated independently.

The concept of open systems is touched upon in many systems engineering documents. This document deals specifically with this subject. To this end, through the various processes applied, it provides information to stakeholders (buyers, suppliers, designers, subcontractors, supervisors, etc.) on the best practice to be adopted.

The specific nature of openness for a system is defined by all the following properties:

— Interchangeability,

— Interoperability,

— Upgradability,

— Reusability,

— Reversibility,

— Flexibility,

— Affordability.

These properties are defined in the glossary for these general guidelines.

These general guidelines are largely based on the structure and system life cycle processes described in standard ISO/IEC 15288:2008.

The characteristics of openness also relate to:

— The products or services offered by the company (target systems resulting from use of company processes).

— The company's processes (project systems). Several stakeholders, with their own assignments, cultures, jobs and geographical locations, different working methods, modelling frameworks, standards, tools and aids, etc. are involved in the activities, which are sometimes multidisciplinary, of the internal and external processes of a company. These diverse elements are not necessarily all suited to working together without causing certain risks, a loss of autonomy, effectiveness and/or efficiency, etc. A company must, for example, develop its ability and capacity in terms of interoperability both internally (between the systems of which it is made) and externally (with other partners), including, by way of an example:

  — Ability of each stakeholder and each department involved to maintain efficient and trusting relationships with other stakeholders, taking into account deadline, cost and quality objectives,

  — Ability to exchange, communicate and use the necessary flows (data, information, knowledge, materials, energy) autonomously, without error and dynamically throughout the life cycle of the target system,

  — Ability to coordinate, synchronise and manage common tasks and share and use resources (human, machine or application) and services efficiently and appropriately.

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.

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

ISO 9241-210:2010, *Ergonomics of human-system interaction — Part 210: Human-centred design for interactive systems*

ISO 10007:2003*, Quality management systems — Guidelines for configuration management*

ISO 10303-1:1994, *Industrial automation systems and integration — Product data representation and exchange — Part 1: Overview and fundamental principles*

ISO/IEC 15288:2008, *Systems and software engineering — System life cycle processes*

ISO/IEC 9126-1:2001, *Software engineering — Product quality — Part 1: Quality model*

IEEE 830:1998, *IEEE Recommended Practice for Software Requirements Specifications*

IEEE 1471:2000, *IEEE Recommended Practice for Architectural Description for Software — Intensive Systems*

3 Terms and definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
affordability
ability of a system to have acceptable operational performance for an acceptable cost of ownership, resulting from a compromise after negotiation between the Parties

[SOURCE: IEEE 1471:2000]

3.1.2
architecture
fundamental organisation of a system described by its components, the relationship between these components and with the environment, and the principles guiding its representation and its development. The relationships between the components are described in the interfaces

3.1.3
capacity
capacity is represented by the consistent integration of a Policy, an Organisation, human resources, training, Support and Equipment

3.1.4
component
product that cannot be broken down from the point of view of a specific application

[SOURCE: ISO 10303-1:1994]

3.1.5
flexibility
ability of a system to continue to fulfil its mission by dynamically or statically adapting to anticipated or foreseeable changes that may occur in its environment

3.1.6
interchangeability
ability of a hardware or software component to be replaced, with no change to the components connected to it, by another that meets the same requirements

3.1.7
interface
an interface is the part of a system or piece of equipment that communicates with another system or piece of equipment

3.1.8
interoperability
interoperability can be defined as the ability of systems to exchange, with no loss or ambiguity, various object flows (data, information, knowledge, materials, energy, etc.), then to be capable of using these objects independently to fulfil their own assignments or to fulfil a shared assignment for a given purpose with no change to their structure, behaviour or operation

3.1.9
key interface
the interface of a module that needs to be interoperable, easy to change, replaced or isolated due to its complexity, obsolescence or the costs involved

3.1.10
operational assignment
operational assignments are the parts of department activities that may be repetitive, planned and of limited duration

3.1.11
product life cycle
this covers all the situations the product goes through during its life from statement of requirement to withdrawal from whatever service is provided

[SOURCE: NF X 50-100:1996]

3.1.12
reusability
for a hardware or software component, ability to be used, unchanged, in a system or subsystem other than the one for which it was originally developed

For a system or subsystem, ability to use, unchanged, hardware or software components which were not originally developed for it

3.1.13
reversibility
ability of a system, subsystem or component to be modified and updated by a manufacturer other than the one that produced it

3.1.14
open system
assembly including software and hardware elements and operating procedures, designed by humans. These elements interact to satisfy the requirements (including interface requirements) defined, published and maintained by general consensus by a group

Modular construction created so that its modules are defined precisely and have public interfaces allowing independent suppliers to provide new capacities and innovative modules

[Modular Open System Architecture]

3.1.15
openness
the characteristic of openness for a system is defined by all the following properties:

— Interchangeability,

— Interoperability,

— Upgradability,

— Reusability,

— Reversibility,

— Flexibility,

— Affordability.

3.1.16
system of systems (SoS)
the characteristics of a system of systems are:

— Operational independence of the systems,

— Managerial independence of the systems,

— Emergence of new services,

— Upgradable configurations,

— Geographic distribution of the systems,

3.1.17
technical facts
key technical event, anticipated or unexpected, in the life cycle of a product

3.1.18
upgradability
potential ability of a system, subsystem or component to respond to changes in operational requirements and anticipated or foreseeable technical changes without affecting the basis of its structure

3.1.19
validation
comparative assessment to confirm that the requirements of stakeholders are properly satisfied. If discrepancies are found, they are recorded and lead to corrective action. Validation is ratified by the stakeholders

[SOURCE: ISO/IEC 15288:2008]

3.1.20
verification
demonstration, through assessment of the product, that the system has been designed correctly, i.e. that it complies with the specifications according to which the product was made

[SOURCE: ISO/IEC 15288:2008]