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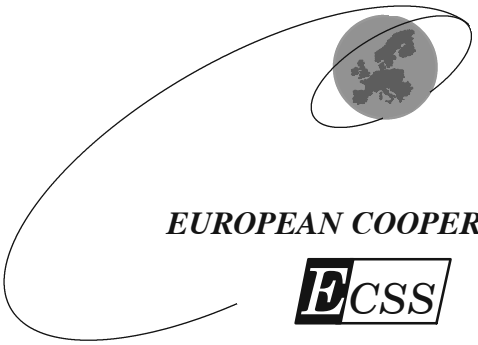

EUROPEAN COOPERATION

FOR SPACE STANDARDIZATION

ECSS

Glossary of Terms

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Foreword

This standard is one of the series of ECSS Standards intended to be applied together for the management, engineering and product assurance in space projects and applications. ECSS is a cooperative effort of the European Space Agency, National Space Agencies and European industry associations for the purpose of developing and maintaining common standards.

Requirements in this standard are defined in terms of what must be accomplished, rather than in terms of how to organise and perform the necessary work. This allows existing organisational structures and methods to be applied where they are effective, and for the structures and methods to evolve as necessary without rewriting the standards.

The formulation of this standard takes into account the existing ISO 9000 family of documents.

This standard has been prepared by the ECSS Vocabulary Working Group, reviewed by the ECSS Technical Panel and approved by the ECSS Steering Board.

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Contents List

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1

Scope

This document controls the definition of all common terms used in the European Cooperation for Space Standardization (ECSS) Standards System. Terms specific to a particular ECSS Standards are defined in that standard.

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2

Normative References

This standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these apply to this ECSS Standard only when incorporated by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 45020:1993	General terms and their definitions concerning standardization and related activities
IEC 50:1992	International Electrotechnical Dictionary
ISO 8402:1994	Quality management and quality assurance - Vocabulary
ISO 10007:1995	Quality management and quality assurance standards - Guide to configuration management
	Oxford English Dictionary

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3

Definitions

The order of precedence for the definition of terms used in the ECSS Standards shall be:

1. this document;
2. IEC 50;
3. ISO Standards;
4. EN 45020;
5. Oxford English Dictionary.

3.1 Acceptance:

The act of an authorised representative of the customer by which the customer assumes for itself, or as an agent of another party, ownership of existing and specified products tendered, or confirms satisfactory performance of specific services, as partial or complete performance of the contract on the part of the supplier.

3.2 Accident:

An undesired event arising from operation of any project-specific items which results in:

a. human death or injury;

b. loss of, or damage to, project hardware, software or facilities which could then affect the accomplishment of the mission;

c. loss of, or damage to, public or private property; or

d. detrimental effects on the environment.

3.3 Actor:

One who acts, or performs any action, or takes part in any affair; a doer (Oxford English Dictionary).

3.4 Alert:

The formal notification to users, informing them of failures or nonconformances of items, already released for use or not, which could also be present on other items already delivered (e.g. items with identical design concept, materials, components or processes).

NOTE An Alert may also be raised when a deficiency in the specified requirements, which may affect the fitness for purpose in the defined application, has been identified.

3.5 Analysis:

The determination of the essential qualities, performance and limitations of an item by cognitive or computational methods.

3.6 Anomaly:

Any deviation from the expected situation.

3.7 Applicable Document:

Normative document imposed on a project.

3.8 Approval:

Formal agreement to use or apply an item.

NOTE Approval implies that the approving authority has verified that the item complies with its requirements and accepts joint liability for the consequences.

3.9 Assembly:

An element of an equipment designed and built to accomplish a specified purpose, which can be disassembled and retain its capabilities after reassembly.

3.10 Assurance:

All the planned and systematic activities implemented, and demonstrated as needed, to provide adequate confidence that an entity will fulfil its requirements.

3.11 Audit:

A systematic and independent examination to determine whether activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives (See ISO 8402:1994, definition of “Quality Audit”).

3.12 Availability (performance):

The ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided (IEC 50:1992).

NOTE 1 This ability depends on the combined aspects of the reliability performance, the maintainability performance and the maintenance support performance.

NOTE 2 Required external resources, other than maintenance resources do not affect the availability performance of the item.

NOTE 3 In French, the term disponibilité is used to denote both the performance and the measure.

NOTE 4 When referring to the measure for Availability, the preferred term is Instantaneous Availability.

3.13 Baseline:

Set of information which describes exhaustively a situation at a given instant of time or over a given time interval.

3.14 Business Agreement:

Any agreement between two or more parties for the supply of goods or services.

3.15 Calibration:

All the operations for the purpose of determining the values of the errors and, if necessary, other metrological properties of a measuring instrument (IEC 50:1992).

NOTE The metrological use of the term “calibration” is often extended to include operations such as adjustments, scale graduation, etc. This use is deprecated.

3.16 Cause:

That which produces an effect; that which gives rise to any action, phenomenon or condition. Cause and effect are correlative terms (Oxford English Dictionary).

3.17 Caution Condition:

A condition which has the potential to degrade into a Warning Condition, and which might require specific action, including the implementation of special procedures or restrictions on the operation of the system.

3.18 Certification:

Procedure by which a third-party gives written assurance that a product, process or service conforms to specified requirements (EN 45020:1993).

3.19 Common Cause Failure:

Failures of multiple items occurring from a single cause which is common to all of them (NUREG/CR-2300'PRA 1982).

3.20 Common Mode Failure:

Failures of multiple similar items that fail in the same mode.

3.21 Common Mode Fault:

Faults of multiple items which exhibit the same fault mode.

3.22 Configuration:

Functional and physical characteristics of a product as defined in technical documents and achieved in the product (ISO 10007:1995).

3.23 Configuration Baseline:

Configuration of a product, formally established at a specific point in time, which serves as a reference for other activities (ISO 10007:1995).

3.24 Configuration Control:

Activities comprising the control of changes to a configuration item after formal establishment of its configuration documents (ISO 10007:1995).

NOTE 1 Control includes evaluation, coordination, approval or disapproval, and implementation of the changes.

NOTE 2 Implementation of changes includes engineering changes and deviations and waivers with impact on the configuration.

3.25 Configuration Documents:

Documents that define the requirements, design, build/production and verification for a configuration item (ISO 10007:1995).

NOTE 1 Documents can be in the form of any media.

NOTE 2 For ECSS, Configuration Documents can include documents relating to operation and disposal of the configuration item.

3.26 Configuration Identification:

Activities comprising determination of the product structure, selection of configuration items, documenting the configuration item's physical and functional characteristics including interfaces and subsequent changes, and allocating identification characters or numbers to the configuration items and their documents (ISO 10007:1995).

3.27 Configuration Item:

Aggregation of hardware, software, processed materials, services or any of its discrete portions, that is designated for configuration management and treated as a single entity in the configuration management process (ISO 10007:1995).

NOTE A configuration item may contain other configuration item(s).

3.28 Configuration Management:

Technical and organisational activities comprising:

a. configuration identification;

b. configuration control;

c. configuration status accounting;

d. configuration audit (ISO 10007:1995).

NOTE For ECSS, the term "Configuration Verification" is equivalent to "Configuration Audit" as used in ISO 10007:1995.

3.29 Configuration Status Accounting:

Formalised recording and reporting of the established configuration documents, the status of proposed changes and the status of the implementation of approved changes (ISO 10007:1995).

3.30 Configuration Verification:

Examination to determine whether a configuration item conforms to its configuration documents (ISO 10007:1995 - definition of "Configuration Audit").

3.31 Contingency Procedure:

A pre-planned procedure to be executed in response to a departure from specified behaviour.

3.32 Contract:

Any legally enforceable business agreement for the supply of goods or services.

NOTE A contract is a special case of a Business Agreement in which payment is associated with the contract conditions.

3.33 Contractor:

Supplier in a contractual situation (ISO 8402:1994).

NOTE 1 In English, the subcontractor may also be called "subsupplier".

NOTE 2 In French, the "sous-contractant" may also be called, as appropriate, "sous-traitant" or "sous-commandier".

3.34 Contractual Milestone:

A milestone significant to contractual activities or deliverables.

3.35 Corrective Action:

Action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation in order to prevent recurrence (ISO 8402:1994).

NOTE 1 The corrective actions may involve changes such as in procedures and systems, to achieve quality improvement at any stage of the quality loop.

NOTE 2 There is a distinction between "correction" and "corrective action". –"Correction" refers to repair, rework or adjustment and relates to the disposition of an existing nonconformity. – "Corrective action" relates to the elimination of the causes of the nonconformity.

NOTE 3 The ECSS term "nonconformance" is equivalent to the term "nonconformity" as used in ISO 8402.

3.36 Cost:

That which must be given or surrendered to acquire, produce, accomplish or maintain something (Oxford English Dictionary) See also "Price".

3.37 Cost Breakdown Structure:

A systematic decomposition and presentation of the total system cost according to Work Packages, the nature of the cost element and the organisational elements responsible for the Work Packages.

3.38 Critical Item:

Any item that introduces risk which could be unacceptable to the project and requires specific attention or control in addition to that given to items not so categorised.

3.39 Customer:

Recipient of a product provided by the supplier (ISO 8402:1994).

NOTE 1 In a contractual situation, the customer is called the "purchaser".

NOTE 2 The customer may be, for example, the ultimate consumer, user, beneficiary or purchaser.

NOTE 3 The customer can be either external or internal to the organisation.

3.40 Data:

Information represented in a manner suitable for automatic processing (IEC 50:1992).

3.41 Demonstration:

A process whereby evidence is produced to provide confidence that the specified requirements are fulfilled.

NOTE A demonstration usually requires all or part of a deliverable product be operated in a manner typical of its intended use. This operation may occur in an environment less stressful than the specified operational environment.

3.42 Dependability:

The collective term used to describe the availability performance and its influencing factors: reliability performance, maintainability performance and maintenance support performance (IEC 50:1992).

NOTE Dependability is used only for general descriptions in non-quantitative terms.

3.43 Derating:

Process of designing a product such that its components operate at a significantly reduced level of stress to increase reliability.

3.44 Design:

1. Set of information which defines the essential characteristics of a product.
2. The process used to generate the set of information describing the essential characteristics of a product.

NOTE In French, characteristics should be translated as proprietés.

3.45 Design to Minimum Risk:

Design of a product to an acceptable residual risk solely by compliance to specific safety requirements, other than failure tolerance.

3.46 Development:

The process by which the capability to adequately implement a technology or design is established before manufacture.

NOTE This process may include the building of various partial or complete models of the products and assessment of their performance.

3.47 Deviation (Production Permit):

Written authorisation to depart from the originally specified requirements for a product prior to its production (ISO 8402:1994 definition of Production Permit).

NOTE A Production Permit is for a limited quantity or period and for a specified use.

3.48 Document:

A medium and the data recorded on it for human use, for example, a report sheet, a book. By extension, any record that has permanence and that can be read by man or machine (ANSI/IEEE Std 100 – 1988).

NOTE Where reference is intended only to the carrier medium, the term “document medium” should be used.

3.49 Documentation:

The accumulation, classification and dissemination of information; the material so collected (Oxford English Dictionary).

3.50 EEE Component:

A device that performs an electrical, electronic or electromechanical function and consists of one or more elements so joined together that they cannot normally be disassembled without destroying this capability. The term EEE Component may be used interchangeably with the term EEE Part.

3.51 Element:

A constituent part of a complex whole (Oxford English Dictionary).

3.52 Emergency:

Condition when potentially catastrophic or critical hazardous events have occurred, and immediate and preplanned safing action is required.

3.53 Environment:

Conditions in which an item exists or is operated.

3.54 Equipment:

An item designed and built to accomplish a specified purpose, which can be disassembled and retain its capabilities after reassembly.

NOTE When this item is composed of software only, it is designated Software Product.

3.55 Error:

A discrepancy between a computed, observed or measured value and the true, specified or theoretically correct value or condition (IEC 50:1992).

NOTE 1 An error can be caused by a faulty item, e.g. a computing error made by faulty computer equipment.

NOTE 2 The French term “erreur” may also designate a mistake.

3.56 Estimate at Completion:

The sum of the cumulative costs incurred up to the cut–off date and the Estimate To Completion from the cut–off date.

3.57 Estimate to Completion:

Based on the work completed, approved contract changes and the incurred commitments, the estimate of all costs from the cut–off date required to deliver the product as specified.

3.58 Event:

The actual or contemplated occurrence of something.

3.59 Failure:

The termination of the ability of an item to perform a required function (IEC 50:1992).

NOTE 1 After failure, the item has a fault.

NOTE 2 "Failure" is an event, as distinguished from "fault", which is a state.

NOTE 3 This concept as defined does not apply to items consisting of software only.

3.60 Failure Mode:

The observable effect of the mechanism through which the failure occurs. e.g. short-circuit, open-circuit, fracture, excessive wear.

NOTE This term is equivalent to the term "Fault Mode" in IEC 50:1992.

3.61 Fault:

1. The state of an item characterised by inability to perform as required, excluding the inability during preventative maintenance or other planned actions, or due to lack of external resources (adapted from IEC 50:1992).
2. An unplanned occurrence or defect in an item which may result in one or more failures of the item itself or of other associated equipment (IEC 50:1992).

NOTE 1 A fault is often the result of a failure of the item itself, but may exist without prior failure.

NOTE 2 An item may contain a sub-element fault, which is a defect that can manifest itself only under certain circumstances (definition #2 above). When those circumstances occur, the defect in the sub-element will cause the item to fail, resulting in an error. This error can propagate to other items causing them, in turn, to fail. After the failure occurs, the item as a whole is said to have a fault or to be in a faulty state (definition #1 above).

3.62 Fault Tolerance:

The attribute of an item that makes it able to perform a required function in the presence of certain given sub-item faults (IEC 50:1992).

3.63 Firmware:

Hardware that contains a computer program or data that cannot be changed in its user environment. The computer program and data contained in firmware are classified as software; the circuitry containing the computer program and data is classified as hardware (ISO/IEC 9126:1991).

3.64 Gantt Chart:

A diagram giving a list of activity headings in one column and the chosen schedule in the abscissa. For each activity, a segment makes it possible to locate in the schedule the period in which it will be carried out. A normal Gantt Chart does not give the links between activities.

3.65 Hazard:

A condition, associated with the design, operation or environment of a system, that has the potential for harmful consequences.

3.66 Hazardous Event:

An occurrence arising from the triggering of one (or more) initiator events in the presence of one (or more) hazards, which may lead to undesired consequences.

3.67 Human Error:

The failure of a person to perform an action as required.

3.68 Implementation Documents:

Formal response from a supplier to the customer describing how all requirements in the Project Requirements Document will be met at his level, in respect to his own organisation.

3.69 Incident:

An unplanned event that could have been an accident, but was not.

3.70 Industrial Organisation:

The identity, interfaces and responsibilities of all participants in the Supplier chain for a project.

3.71 Information:

Intelligence or knowledge capable of being represented in forms suitable for communication, storage or processing (IEC 50:1992).

NOTE Information may be represented, for example, by signs, symbols, pictures or sounds.

3.72 Inhibit:

1. To stop or prevent the occurrence of an event (Oxford English Dictionary).
2. A design feature that provides a physical interruption between an energy source and a function actuator.

3.73 Inspection:

An activity such as measuring, examining, testing or gauging one or more characteristics of an entity and comparing the results with specified requirements in order to establish whether conformity is achieved for each characteristic (ISO 8402:1994).

NOTE 1 In French, the term “inspection” may designate an activity of quality surveillance carried out within the framework of a defined assignment.

NOTE 2 The above definition is valid for the purposes of quality standards. The term “inspection” is defined differently in ISO/IEC Guide 2.

3.74 Instantaneous Availability:

The probability that an item is in a state to perform a required function under given conditions at a given instant of time, assuming that the required external resources are available (IEC 50:1992).

NOTE In French, the term “disponibilité” is also used to denote the performance quantified by this probability.

3.75 Item:

Anything which can be individually described and considered (ISO 8402:1994).

NOTE An item may be, for example:

a) an activity or process;
b) a product; an organisation, system or person; or
c) any combination thereof.

3.76 Life Cycle Cost:

The total cost of a system, from “needs identification” until disposal.

3.77 Maintainability:

The ability of an item under given conditions of use, to be retained in, or restored to, a state in which it can perform a required function, when maintenance is per-

formed under given conditions and using stated procedures and resources (IEC 50:1992).

NOTE The term "maintainability" is also used as a measure of maintainability performance. In this sense, maintainability is "the probability that a given active maintenance action, for an item under given conditions of use can be carried out within a stated time interval, when maintenance is performed under stated conditions and using stated procedures and resources".

3.78 Maintenance:

The combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function (IEC 50:1992).

3.79 Material:

A raw or semi–finished substance or compound, of specified characteristics, which is processed to form a part of a finished product.

3.80 Materiel:

A collective term for the articles, supplies, machinery, etc. used in an organisation, as distinguished from the personnel or body of persons employed.

3.81 Mean Time Between Failures:

The expectation of the time between failures (IEC 50:1992).

NOTE In English, the use of the abbreviation MTBF in this sense is now deprecated.

3.82 Mechanical Part:

A piece of hardware which is not electrical, electronic or electromechanical, and which performs a simple (elementary) function or part of a function in such a way that it can be evaluated as a whole against expected performance requirements and cannot be disassembled without destroying this capability.

3.83 Milestone:

A significant event during the execution of a project, which can allow assessment of work progress.

3.84 Mission:

The specific task, duty or function defined to be accomplished by a system.

3.85 Model:

A physical or abstract representation of relevant aspects of an item or process that is put forward as a basis for calculations, predictions or further assessment; to create or use such a model (Oxford English Dictionary).

NOTE Model can also be used to identify particular instances of the product e.g. Flight Model.

3.86 Network:

An interconnected chain or system of material or immaterial things (Oxford English Dictionary).

3.87 Nonconformance:

Nonfulfillment of a specified requirement (ISO 8402:1994 – definition of Nonconformity).

NOTE The definition covers the departure or absence of one or more quality characteristics (including dependability characteristics), or quality system elements from specified requirements.

3.88 Nonrecurrent Cost:

Costs incurred to a project which are independent of the number of identical items produced.

3.89 Normative Document:

A document that provides rules, guidelines or characteristics for activities or their results (EN 45020:1993).

NOTE 1 The term "Normative Document" is a generic term that covers such documents as standards, technical specifications, codes of practice and regulations.

NOTE 2 A document is understood as any medium with information recorded on or in it.

NOTE 3 The terms for different kinds of Normative Documents are defined considering the document and its contents as a single entity.

3.90 Normative Reference:

A reference which incorporates requirements from a cited publication into a normative document.

3.91 Outage:

The state of an item of being unable to perform its required function (IEC 50:1992).

3.92 Part:

Any hardware item which cannot be disassembled without destroying the capability to perform its required function.

3.93 Performance:

Those generally quantified aspects of an item observed or measured from its operation or function.

3.94 Pressure Vessel:

A container which stores pressurised fluids and:

a. contains stored energy of 19310 joules or greater, based on the adiabatic expansion of a perfect gas; or

b. contains a gas or liquid which may result in a hazardous event if released; or

c. will experience a design limit pressure greater than 0.69 MPa.

3.95 Preventive Action:

Action taken to eliminate the causes of a potential nonconformity, defect or other undesirable situation in order to prevent occurrence (ISO 8402:1994).

NOTE The preventive actions may involve changes, such as in procedures and systems, to achieve quality improvement at any stage of the quality loop.

3.96 Price:

That which must be given or surrendered to the contractor to acquire, produce, accomplish or maintain something. See also "Cost".

3.97 Procedure:

Specified way to perform an activity (ISO 8402:1994).

NOTE 1 In many cases, procedures are documented (e.g. quality system procedures).

NOTE 2 When a procedure is documented, the term “written procedure” or “documented procedure” is frequently used.

NOTE 3 A written or documented procedure usually contains the purposes and scope of an activity; what shall be done and by whom; when, where and how it shall be done; what materials, equipment and documents shall be used; and how it shall be controlled and recorded.

3.98 Process:

Set of inter-related resources and activities which transform inputs into outputs (ISO 8402:1994).

NOTE Resources may include personnel, finance, facilities, equipment, techniques and methods.

3.99 Product:

The result of activities or processes (ISO 8402:1994).

NOTE 1 A product may include service, hardware, processed materials, software or a combination thereof.

NOTE 2 A product can be tangible (e.g. assemblies or processed materials) or intangible (e.g. knowledge or concepts), or a combination thereof.

NOTE 3 A product can be either intended (e.g. an offering to customers) or unintended (e.g. pollutant or unwanted effects).

3.100 Product Assurance:

A discipline devoted to the study, planning and implementation of activities intended to assure that the design, controls, methods and techniques in a project result in a satisfactory level of quality in a product.

3.101 Product State:

A particular configuration of the product related to the current configuration baseline.

3.102 Product Tree:

Hierarchical representation of the system resulting from an orderly and exhaustive identification of its successive levels of decomposition.

3.103 Project:

A unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organisation to meet specific objectives within defined schedule, cost and performance parameters (BS 6079).

3.104 Project Phase:

That part of a total project during which activities are performed to attain a designated objective. One of a series of distinct steps in carrying out a project that together constitute the project life cycle (adapted from BS 6079).

3.105 Project Requirements Documents:

Those documents, including all normative references, which establish requirements which are subsequently used to control work or work products.

NOTE 1 Examples of Project Requirements Documents include, but are not limited to, Standards, Management Specifications, Technical Specifications, Statements of Work and Data Requirements Lists.

NOTE 2 This does not include the contract and associated terms and conditions.

3.106 Purchaser:

Customer in a contractual situation (ISO 8402:1994).

NOTE The purchaser is sometimes referred to as the "business second party".

3.107 Qualification Process:

Process of demonstrating whether an entity is capable of fulfilling specified requirements (ISO 8402:1994).

NOTE 1 The term "qualification" is sometimes used to designate this process.

NOTE 2 Specified requirements include qualification margins.

3.108 Quality:

The totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs (ISO 8402:1994).

NOTE 1 In a contractual environment, or in a regulated environment, such as the nuclear safety field, needs are specified, whereas in other environments, implied needs should be identified and defined.

NOTE 2 In many instances, needs can change with time; this implies a periodic review of requirements for quality.

NOTE 3 Needs are usually translated into characteristics with specified criteria. Needs may include, for example, aspects of performance, usability, dependability (availability, reliability, maintainability), safety, environment, economics and aesthetics.

NOTE 4 The term "quality" should not be used as a single term to express a degree of excellence in a comparative sense, nor should it be used in a quantitative sense for technical evaluations. To express these meanings, a qualifying adjective should be used. For example, use can be made of the following terms:

a) "Relative Quality" where entities are ranked on a relative basis in the degree of excellence or comparative sense (not to be confused with "grade").

b) "Quality Level" in a quantitative sense (as used in acceptance sampling) and "Quality Measure" where precise technical evaluations are carried out.

NOTE 5 The achievement of satisfactory quality involves all stages of the quality loop as a whole. The contributions to quality of these various stages are sometimes identified separately for emphasis; for example, quality due to definition of needs, quality due to product design, quality due to conformance, quality due to product support throughout its lifetime.

NOTE 6 In some references, quality is referred to as "fitness for use" or "fitness for purpose" or "customer satisfaction" or "conformance to the requirements". These represent only certain facets of quality, as defined above.

3.109 Quality Assurance:

All the planned and systematic activities implemented within the quality system and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality (ISO 8402:1994).

NOTE 1 There are both internal and external reasons for quality assurance:

a) internal quality assurance: within an organisation, quality assurance provides confidence to the management;

b) external quality assurance: in contractual or other situations, quality assurance provides confidence to the customers or others.

NOTE 2 Some quality control and quality assurance actions are interrelated.

NOTE 3 Unless requirements for quality fully reflect the needs of the user, quality assurance may not provide adequate confidence.

3.110 Quality Control:

Operational techniques and activities that are used to fulfil requirements for quality (ISO 8402:1994).

NOTE 1 Quality control involves operational techniques and activities aimed both at monitoring a process and at eliminating causes of unsatisfactory performance at all stages of the quality loop in order to achieve economic effectiveness.

NOTE 2 Some quality control and quality assurance actions are interrelated.

3.111 Quality Record:

Document which furnishes objective evidence of activities performed or results achieved.

NOTE 1 A quality record provides objective evidence of the extent of fulfilment of the requirements for quality (e.g. product quality record) or the effectiveness of the operation of a quality system element (e.g. quality system record).

NOTE 2 Some of the purposes of quality records are demonstration, traceability and preventive and corrective actions.

NOTE 3 A record can be written or stored on any data medium.

3.112 Recurrent Cost:

Costs incurred for each additional, identical item produced.

3.113 Release:

To make available for publication or use; to publish (Oxford English Dictionary).

3.114 Reliability:

The probability that an item can perform a required function under given conditions for a given time interval (IEC 50:1992).

NOTE 1 It is generally assumed that the item is in a state to perform this required function at the beginning of the time interval.

NOTE 2 The term “reliability” is also used to denote the non-quantified ability of an item to perform a required function under stated conditions for a specified period of time.

3.115 Reliability Critical Item:

An item which contains a single point failure with a failure consequence severity classified as catastrophic, critical or major.

3.116 Repair:

An action taken on a nonconforming product so that it will fulfil the intended usage requirements although it will not conform to the originally specified requirements (ISO 8402:1994).

NOTE 1 Repair is one type of disposition of a nonconforming product.

NOTE 2 Repair includes remedial action taken to restore, for usage, a once conforming but now nonconforming product, for example, as part of maintenance.

3.117 Required Function:

A function or a combination of functions of an item which is considered necessary to provide a given service (IEC 50:1992).

3.118 Requirement:

That which is called for or is demanded: a condition which must be complied with (Oxford English Dictionary).

3.119 Residual Risk:

The risk remaining in a system after completion of the hazard reduction and control process.

3.120 Resource:

Any physically or conceptually identifiable entity whose use and state at any time can be unambiguously determined (IEC 50:1992).

3.121 Review:

Systematic examination of items for the purpose of assessing the results obtained at a given time in the project, by persons not themselves responsible for the project.

3.122 Rework:

An action taken on a nonconforming product so that it will fulfil the specified requirements (ISO 8402:1994).

NOTE Rework is one type of disposition of a nonconforming product.

3.123 Risk:

A quantitative measure of the magnitude of a potential loss and the probability of incurring that loss.

3.124 Safety:

A State in which the risk of harm (to persons) or damage is limited to an acceptable level (ISO 8402:1994).

NOTE 1 Safety is one of the aspects of quality.

NOTE 2 The above definition is valid for the purposes of quality standards. The term “Safety” is defined differently in ISO/IEC Guide 2.

3.125 Safety Critical Function:

A function which, if lost or degraded, or which through incorrect or inadvertent operation, could result in a catastrophic or critical hazardous event.

3.126 Safing:

The action of placing a system, or part thereof, in a predetermined safe condition.

3.127 Schedule:

An ordered set of activities and events, with associated times of occurrence.

3.128 Series Production:

Production of recurring products.

3.129 Service:

The result generated by activities at the interface between the supplier and the customer and by supplier internal activities to meet the customer needs (ISO 8402:1992).

NOTE 1 The supplier or the customer may be represented at the interface by personnel or equipment.

NOTE 2 Customer activities at the interface with the supplier may be essential to the service delivery.

NOTE 3 Delivery or use of tangible products may form part of the service delivery.

NOTE 4 A service may be linked with the manufacture and supply of tangible product.

3.130 Set:

Group of physically or functionally related items which are considered together for technical or administrative reasons, but whose association does not increase functionality over that of the individual items.

3.131 Severity:

A classification of a failure or undesired event according to the magnitude of its possible consequences.

3.132 Software:

Programs, procedures, rules and any associated documentation pertaining to the operation of a computer system (ISO/IEC 9126:1991).

3.133 Software Module:

The smallest program unit that is discrete and identifiable with respect to compiling, combining with other units and loading.

3.134 Software Product Assurance:

Product Assurance applied to software.

3.135 Space Element:

A product or a set of products intended to be operated in outer space.

3.136 Space Project:

A project which produces a Space System.

3.137 Space System:

A system which contains at least one space element.

3.138 Specification:

Document stating requirements (ISO 8402:1992).

NOTE 1 A qualifier should be used to indicate the type of specification, such as “product specification”, “test specification”.

NOTE 2 A specification should refer to or include drawings, patterns or other relevant documents and indicate the means and the criteria whereby conformity can be checked.

3.139 Subcontract:

In the Customer–Supplier chain, a contract between a Contractor and their subordinate contractor; to obtain materials or other inputs to a product in this manner.

3.140 Subsystem:

Set of interdependent elements constituted to achieve a given objective by performing a specified function, but which does not, on its own, satisfy the customer's need.

3.141 Supplier:

An organisation that provides a product to the customer (ISO 8402:1994).

NOTE 1 In a contractual situation, the supplier may be called the "contractor".

NOTE 2 The supplier may be, for example, the producer, distributor, importer, assembler or service organisation.

NOTE 3 The supplier can be either internal or external to the organisation.

3.142 Support System:

All resources and organisation needed to maintain the performance capabilities of the supported system from acceptance to the end of disposal.

NOTE Some items can start as part of the system and later, modified as necessary, become part of the Support System. e.g. Electrical Ground Support Equipment.

3.143 Supported System:

Product which performs the functions required by the customer.

3.144 System:

Set of interdependent elements constituted to achieve a given objective by performing a specified function (IEC 50:1992).

NOTE The system is considered to be separated from the environment and other external systems by an imaginary surface which cuts the links between them and the considered system. Through these links, the system is affected by the environment, is acted upon by external systems, or acts itself on the environment or the external systems.

3.145 Tailoring:

The process by which individual requirements (clauses, paragraphs or sentences) of specifications, standards and related documents are evaluated and made applicable to a specific project in the most cost–effective manner. The evaluation will determine the extent to which the requirements are most suitable for the acquisition or development of a specific system. Application of the requirements may be any of deletion, addition or modification of requirements in the standard(s).

3.146 Task:

A specific piece of work to be done.

3.147 Test:

A formal process of exercising or putting to trial a system or item by manual or automatic means to identify differences between specified, expected and actual results.

3.148 Third Party:

Person or body that is recognised as being independent of the parties involved, as concerns the issue in question (EN 45020:1993).

NOTE Parties involved are usually supplier ("first party") and purchaser ("second party").

3.149 Traceability:

Ability to trace the history, application or location of an entity by means of recorded identifications (ISO 8402:1994).

NOTE 1 The term "traceability" may have one of three main meanings:

a) in a product sense, it may relate to – the origin of materials and parts; – the product processing history; the distribution and location of the product after delivery;

b) in a calibration sense, it relates measuring equipment to national or international standards, primary standards, basic physical constants or properties, or reference materials;

c) in a data–collection sense, it relates calculations and data generated through the quality loop sometimes back to the requirements for quality for an entity.

NOTE 2 All aspects of traceability requirements, if any, should be clearly specified, for example, in terms of periods of time, point of origin or identification.

3.150 Validation:

Confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled (ISO 8402:1994).

NOTE 1 In design and development, validation concerns the process of examining a product to determine conformity with user needs.

NOTE 2 Validation is normally performed on the final product under normal operating conditions. It may be necessary in earlier stages.

NOTE 3 The term "validated" is used to designate the corresponding status.

NOTE 4 Multiple validations may be carried out if there are different intended uses.

3.151 Verification:

Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled (ISO 8402:1994).

NOTE 1 In design and development, verification concerns the process of examining the result of a given activity to determine conformity with the stated requirements for that activity.

NOTE 2 The term "verified" is used to designate the corresponding status.

3.152 Waiver:

Written authorisation to use or release a product which does not conform to the specified requirements (ISO 8402:1994).

NOTE A waiver is limited to the shipment of a product that has specific nonconforming characteristics within specific deviations, for a limited time or quantity.

3.153 Warning Condition:

Condition in which potentially catastrophic or critical hazardous events have been detected as being imminent and preplanned safing action is required within a limited time.

3.154 Work Breakdown Structure:

Hierarchical representation of the activities and resources necessary to complete a project.

3.155 Work Package:

A group of related tasks that are defined at the lowest level within a Work Breakdown Structure.

3.156 Workmanship:

The physical characteristics relating to the level of quality introduced by the manufacturing and assembly activities.

4

Abbreviations

The following abbreviations are used in the ECSS standards:

AIV:	Assembly, Integration and Verification
AOCS:	Attitude & Orbit Control System
AR:	Acceptance Review
CAD:	Computer Aided Design
CDR:	Critical Design Review
CECC:	CENELEC Electronic Components Committee
CENELEC:	Comité Européen de Normalisation Electrotechnique
DJF:	Design Justification File
DML:	Declared Material List
DMPL:	Declared Mechanical Part List
DPA:	Destructive Physical Analysis
DPL:	Declared Process List
DRB:	Delivery Review Board
EAC:	Estimate At Completion
ECLS:	Environmental Control and Life Support
ECSS:	European Cooperation for Space Standardization
EEE:	Electronic, Electrical, Electromechanical
EGSE:	Electric Ground Support Equipment
EIDP:	End Item Data Package
EMC:	Electro-Magnetic Compatibility
ESA:	European Space Agency
ESA/SCC:	European Space Agency Space Components Coordination
FMECA:	Failure Modes Effects and Criticality Analysis
FRR:	Flight Readiness Review
FTA:	Fault Tree Analysis
GEO:	Geostationary Orbit
GSE:	Ground Support Equipment

ICD:	Interface Control Document
ILS:	Integrated Logistic Support
IRD:	Interface Requirement Document
ISVV:	Independent software verification and validation
LAT:	Lot Acceptance Test
LEO:	Low Earth Orbit
LRR:	Launch Readiness Review
LSA:	Logistic Support Analysis
MIP:	Mandatory Inspection Point
MPP:	Milestone Payment Plan
MRB:	Material Review Board
NASA:	National Aeronautics and Space Administration
NCR:	Nonconformance Report
PA:	Product Assurance
PAD:	Part Approval Document
PDR:	Preliminary Design Review
PHST:	Packaging, Handling, Storage, Transport
PRR:	Preliminary Requirements Review
PPL:	Preferred Parts List
QA:	Quality Assurance
QCI:	Quality Conformance Inspection
QR:	Qualification Review
R&D:	Research and Development
RE:	Requirements Engineering
RFA:	Request For Approval
RVT:	Radiation Verification Testing
SE:	System Engineering
SEMP:	System Engineering Management Plan
SOW:	Statement of Work
SRR:	System Requirements Review
TBD:	To Be Defined
TRB:	Test Review Board
TS:	Technical Specification
VCD:	Verification Control Document
WBS:	Work Breakdown Structure
WP:	Work Package

5

Index

A

B

C

D

E

F

G

H

I

L

M

N

O

P

Q

R

S

T

V

W