IEC TS 62775

Edition 1.0 2016-05

TECHNICAL SPECIFICATION

colour inside

Application guidelines – Technical and financial processes for implementing asset management systems

IEC TS 62775:2016-05(en)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 03.120.01; 03.120.10

ISBN 978-2-8322-3391-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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APPLICATION GUIDELINES – TECHNICAL AND FINANCIAL PROCESSES FOR IMPLEMENTING ASSET MANAGEMENT SYSTEMS

FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62775, which is a Technical Specification, has been prepared by IEC technical committee 56: Dependability.

The text of this Technical Specification is based on the following documents:

Enquiry draft	Report on voting
56/1644/DTS	56/1675/RVC

Full information on the voting for the approval of this Technical Specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International Standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date

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INTRODUCTION

Asset management is a multi-disciplinary business activity comprising financial, technical and risk components. Effective control and governance of assets by organizations is essential to realizing value from their use through the management of risk. The value derived through the use of assets is determined by the organization.

The organization's decision-making processes are effective when they address technical and financial risks together and when those processes achieve a ‘desired balance of cost, risk and performance’- as required by the ISO 5500x asset management suite. Thus, the processes developed within the asset management system (AMS) need to integrate financial and accounting procedures with technical and management activities, using risk based decision making.

The ISO 5500x asset management suite of standards defines the principles of asset management and documents the requirements for an AMS that implements those principles. However, ISO 55001 explicitly excludes information necessary to implement the technical and financial processes in support of the management of assets.

The IEC dependability suite of standards provide guidance on technical processes and techniques that achieve desired availability, reliability, maintainability and supportability of assets, products and systems. Systems engineering standards describe the life cycle of systems and define the processes needed for the engineering management of a system while the International Financial Reporting Standards (IFRS) provides a suite of globally accepted international financial reporting standards and a suite of supporting accounting standards in the form of the International Accounting Standards (IAS).

This Technical Specification demonstrates the relationship between the ISO AMS standards, the ISO/IEC/IEEE systems engineering standards, the IEC dependability standards and the IFRS and IAS financial standards.

APPLICATION GUIDELINES – TECHNICAL AND FINANCIAL PROCESSES FOR IMPLEMENTING ASSET MANAGEMENT SYSTEMS

1 Scope

IEC 62775, which is a Technical Specification, shows how the IEC dependability suite of standards, systems engineering and the IFRS and IAS standards can support the requirements of asset management, as described by the ISO 5500x suite of standards.

This Technical Specification therefore provides

- a brief introduction to asset management and the requirements for an AMS,
- a description of the benefits from the use of an established and common set of AMS processes and procedures, tools and techniques to manage assets, and
- a description of the relationships between the AMS and the tools and techniques, processes and procedures of
  - ISO/IEC/IEEE 15288:2015, Systems and software engineering – System lifecycle processes,
  - IEC dependability standards in particular IEC 60300-3-15, and
  - relevant IFRS and supporting IAS standards.

This Technical Specification is intended for

- asset managers who wish to identify and implement technical and financial processes within an AMS, using dependability techniques and IFRS and IAS standards respectively, and
- systems and dependability engineers who need to apply their technical processes and techniques within an AMS.

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 55001:2014, *Asset management – Management systems – Requirements*

3 Terms and definitions

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

3.1
accrual accounting
accounting which depicts the effects of transactions and other events and circumstances on a reporting entity's economic resources and claims in the periods in which those effects occur, even if the resulting cash receipts and payments occur in a different period

Note 1 to entry: In order to meet their objectives, financial statements are prepared on the accrual basis of accounting.

[SOURCE: IFRS – IASB Conceptual Framework for Financial Reporting 2010]

3.2
asset
item, thing or entity that has potential or actual value to an organization

Note 1 to entry: Value can be tangible or intangible, financial or non-financial, and includes consideration of risks and liabilities. It can be positive or negative at different stages of the asset life.

Note 2 to entry: Physical assets usually refer to equipment, inventory and properties owned by the organization. Physical assets are the opposite of intangible assets, which are non-physical assets such as leases, brands, digital assets, use rights, licences, intellectual property rights, reputation or agreements.

Note 3 to entry: A grouping of assets referred to as an asset system could also be considered as an asset.

[SOURCE: ISO 55000:2014, 3.2.1]

3.3
asset management
coordinated activity of an organization to realize value from assets

Note 1 to entry: Realization of value will normally involve a balancing of costs, risks, opportunities and performance benefits.

Note 2 to entry: Activity can also refer to the application of the elements of the asset management system.

Note 3 to entry: The term “activity” has a broad meaning and can include, for example, the approach, the planning, the plans and their implementation.

[SOURCE: ISO 55000:2014, 3.3.1]

3.4
asset management objective
overarching objective that sets the context and direction for an organization’s asset management activities

Note 1 to entry: Asset management objectives are established through the strategic level planning activities of the organization.

[SOURCE: ISO 55000:2014, 3.1.14, modified — the preferred term "organizational objective" has been replaced by "asset management objective" and in the definition "asset management" has been added]

3.5
asset management system
AMS
management system for asset management whose function is to establish the asset management policy and asset management objectives

Note 1 to entry: The asset management system is a subset of asset management.

[SOURCE: ISO 55000:2014, 3.4.3]

3.6
fair value
price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (as might appear on the organizational balance sheet)

[SOURCE: IFRS 13:2013 Fair Value Measurement, modified — “(as might appear on the organizational balance sheet)” has been added]

3.7
management system
set of interrelated or interacting elements of an organization to establish policies and objectives and processes to achieve those objectives

Note 1 to entry: A management system can address a single discipline or several disciplines.

Note 2 to entry: The system elements include the organization's structure, roles and responsibilities, planning, operation, etc.

Note 3 to entry: The scope of a management system may include the whole of the organization, specific and identified functions of the organization, specific and identified sections of the organization, or one or more functions across a group of organizations.

[SOURCE: ISO 55000:2014, 3.4.2].

3.8
dependability
ability to perform as and when required

Note 1 to entry: Dependability includes availability, reliability, recoverability, maintainability, and maintenance support performance, and, in some cases, other characteristics such as durability, safety and security.

Note 2 to entry: Dependability is used as a collective term for the time-related quality characteristics of an item.

[SOURCE: IEC 60050-192:2015, 192-01-22]

3.9
process
set of interrelated or interacting activities which transforms inputs into outputs

[SOURCE: ISO 55000:2014, 3.1.19]

3.10
risk
effect of uncertainty on objectives

Note 1 to entry: An effect is a deviation from the expected — positive and/or negative.

Note 2 to entry: Objectives can relate to different disciplines (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process).

Note 3 to entry: Risk is often characterized by reference to potential "events" (as defined in ISO Guide 73:2009, 3.5.1.3) and "consequences" (as defined in ISO Guide 73:2009, 3.6.1.3), or a combination of these.

Note 4 to entry: Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated "likelihood" (ISO Guide 73:2009, 3.6.1.1) of occurrence.

Note 5 to entry: Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.

[SOURCE: ISO 55000:2014, 3.1.21]

3.11
stakeholder
person or organization that can affect, be affected by, or perceive themselves to be affected by a decision or activity

Note 1 to entry: A "stakeholder" can also be referred to as an "interested party".

[SOURCE: ISO 55000:2014, 3.1.22]

3.12
strategic asset management plan
SAMP
documented information that specifies how organizational objectives are to be converted into asset management objectives, the approach for developing asset management plans and the role of the AMS in supporting achievement of the asset management objectives

Note 1 to entry: A strategic asset management plan is derived from the organizational plan.

Note 2 to entry: A strategic asset management plan may be contained in, or may be a subsidiary plan of, the organizational plan.

[SOURCE: ISO 55000:2014, 3.3.2]

4 Management systems environment

4.1 Overview

There are many standards, which can be implemented to successfully manage organizational functions. These range from high-level management system standards to detailed technical and financial standards for the implementation of particular tasks.

The ISO 5500x suite of management system standards requires the integration of technical and financial decision making and reporting, however they explicitly exclude specific technical or financial process information, other than what might be generally referenced in a bibliography. Similarly, IEC dependability standards rarely include reference to the needs of management systems outside the dependability management function, nor include reference to relevant financial standards and related requirements.

Additionally, the IFRS suites of standards make no reference to the needs of management systems nor do they include reference to relevant technical processes and requirements.

The role of each independent set of standards are summarized in the following list:

- ISO 5500x asset management suite specifies the requirements for the establishment, implementation, maintenance and improvement of an AMS;
- ISO/IEC/IEEE 15288 provides a tool that can be used to manage technical and financial processes;
- IEC dependability standards describe technical processes and activities, and how to tailor them for use within the AMS;
- IFRS suite of financial standards describe the financial processes that can be used within the AMS.

NOTE 1 For purposes of clarity and use within this Technical Specification, a “system” (see ISO/IEC/IEEE 15288) is considered to be equivalent to an “asset” (see ISO 55000), “asset system” (see ISO 55000) and an “item” (see IEC 60050-192) – that is, the terms are equivalent.

NOTE 2 For describing processes this Technical Specification uses the hierarchical terms of processes, activities, tasks and notes as described in ISO/IEC TR 24774.

4.2 Benefits to asset management from integrating financial and technical processes

The benefits that result from the integration of technical and financial standards are likely to be significant. Specifically these may include

- greater understanding of both technical and financial systems and the relationship between them,
- improved asset management delivery through integration with dependability management,
- reduction in complex and critical system failures and their consequences, and

- systems that are more efficient, cost effective and dependable.

4.3 ISO 5500x suite – Asset management

The ISO 5500x asset management suite of standards defines the principles of asset management and documents the requirements for a supporting management system for managing assets – the AMS.

ISO 55000 documents the principles of asset management to be implemented by the AMS. It also provides a common set of terms that can be used to describe the

- management of assets,
- relevant elements of an AMS, and
- elements of the technical and financial processes of that AMS.

ISO 55001 specifies requirements for the design, implementation, operation and improvement of specific asset management plans to meet asset management objectives. The implementation and continual improvement of those plans deliver the intended organizational outputs and outcomes provided through the use of assets. The standard also specifies requirements for the design, implementation, operation and improvement of the AMS itself.

Asset management objectives provide the link between the organizational objectives and asset management. The AMS transforms the organizational objectives into realizable asset management objectives.

Asset management objectives are tailored to suit each organization's needs. Some typical organizational outcome measures that may be addressed by asset management objectives include the following:

- the desired balance of cost, risk and performance;
- total cost of ownership;
- market share and share price;
- return on investment;
- return on asset value (both in terms of the balance sheet value and the value to the business);
- unit cost of product or service;
- asset and asset system availability, reliability, maintainability, and supportability.

4.4 Systems engineering

4.4.1 Overview

Systems engineering applies a multidisciplinary approach to achieve a balanced solution to agreed stakeholder needs, throughout the life cycle of a system.

ISO/IEC/IEEE 15288 provides a combined technical and business approach to managing technical processes. It establishes a common framework for describing the life cycle of systems and defines the processes needed for engineering management over the life of a system from the concept of ideas through to the retirement of a system. It also describes the processes for acquiring and sustaining systems and helps to improve communication and cooperation among the parties that create, utilize and manage modern systems.

4.4.2 Characteristics of a system

The following are key points regarding the characteristics of a system in the systems engineering environment:

- system boundaries and stakeholder needs are defined;
- there is a hierarchical or other relationship between system elements;
- a system comprises an integrated, defined set of subordinate system elements;
- an entity at any level in the system-of-interest can be viewed as a system;
- characteristic properties at a system's boundary arise from the interactions among system elements;
- humans can be viewed both as users external to a system and as system elements (i.e. operators) within a system;
- a system can be viewed in isolation as an entity, i.e. a product, or as a collection of functions capable of interacting with its surrounding environment, i.e. a set of services.

4.4.3 Application of ISO/IEC/IEEE 15288

ISO/IEC/IEEE 15288 describes

- the life cycle processes of an engineering management system, and
- the life cycle processes needed to support assets.

The standard provides requirements for a number of processes and activities that can be applied throughout the life cycle. Not all processes and activities apply to all organizations and all projects. Organizations select those that are relevant depending on the context, organizational objectives and stakeholder needs and attitude to risk.

ISO/IEC/IEEE 15288 does not prescribe a specific life cycle model but proposes that the user should map the processes, activities and tasks described in the standard into a life cycle model that suits their context.

The role of ISO/IEC/IEEE 15288 is to

- provide a benchmark of what needs to be done and why, when defining an organization's policies and procedures for systems engineering functions;
- describe how the organization can establish technical processes, how these can be used by suppliers and how the assessment of both internal and supplier systems engineering capability can be done;
- set a basis for awarding contracts and
- define acceptable industry practices.

The standard supports the definition, control, assessment and improvement of the processes. The standard lists the activities and tasks needed within the processes, however it does not provide the detail of how to perform them.

4.4.4 System life cycle processes

In ISO/IEC/IEEE 15288, the processes and activities performed during the life cycle of a system are placed in one of four process groups as depicted in Figure 1. These are agreement processes, organizational project enabling processes, technical management processes and technical processes. The process groups are not intended to preclude or discourage the use of additional processes that organizations might find useful.

Each of the life cycle processes within those groups can be described in terms of its purpose and desired outcomes and the activities and tasks that need to be performed to achieve those outcomes. The standard provides information to enable users to define those activities and tasks to meet their specific outcomes.

The systems engineering life cycle process descriptions and their associated notes do not provide a complete and implementable set of processes. Further detail is necessary and is provided by the dependability suite of standards.

Organizations should use tailoring guides and their detailed technical knowledge of the business and/or industry to select and apply IEC dependability and IFRS standards. The IEC dependability standards support a number of the ISO 15288 systems engineering life cycle processes, which would satisfy some, or all of the ISO 55001 requirements.

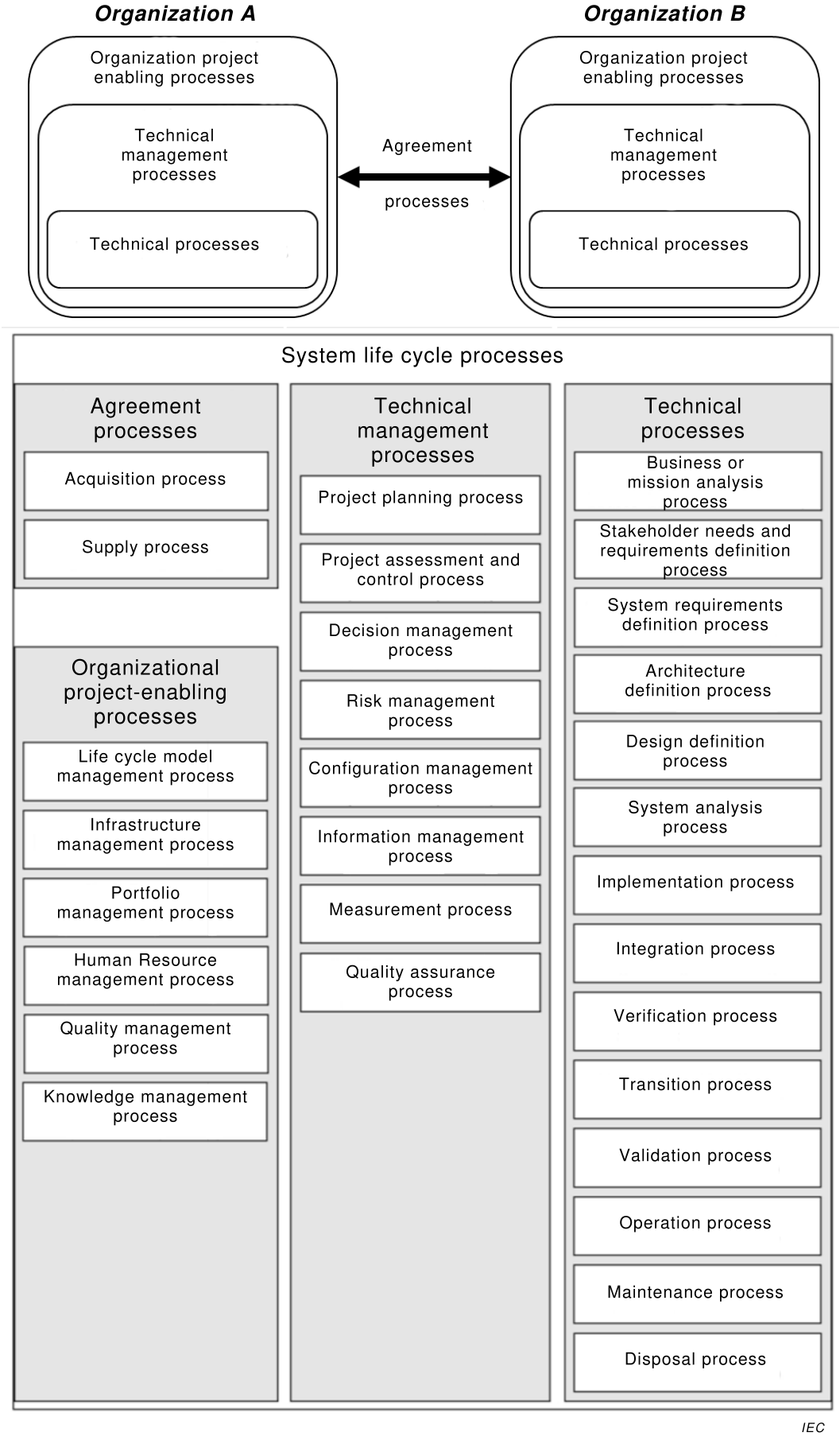

Figure 1 – System life cycle processes – ISO/IEC/IEEE 15288:2015

4.5 IFRS and IAS standards

4.5.1 Overview

The IFRS and accompanying IAS suite of standards published by the International Accounting Standards Board (IASB) provide international standards relevant to asset management decision making and financial reporting.

Annex A contains a summary of the scope of IFRS and IAS suite of standards that relate to the content of this Technical Specification.

The standards provide a common set of terms and a framework for financial reporting that brings transparency, accountability and efficiency to financial systems internationally.

The IASB also defines a conceptual framework that sets out the concepts that underlie the preparation and presentation of financial statements.

4.5.2 Conceptual framework

The conceptual framework of the IASB sets out the concepts that underlie the preparation and presentation of financial statements.

It deals with the following.

- The objective of financial reporting

  This is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity. Those decisions involve buying, selling or holding equity and debt instruments, and providing or settling loans and other forms of credit – all of which are tools/techniques used in the management of assets.

- The qualitative characteristics of useful financial information

  This identifies the types of information to be provided in financial reports that are likely to be most useful for making decisions. For financial information to be useful it needs to be relevant, that is, it needs to have predictive value and confirmatory value, in the context of an entity's financial report.

- The definition, recognition and measurement of the elements from which financial statements are constructed

  The elements directly related to the measurement of financial position are assets, liabilities and equity. These are defined as follows:

  – an asset is a resource (including physical and non physical assets) controlled by the entity as a result of past events and from which future economic benefits are expected;

  – a liability is a present obligation of the entity arising from past events, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits;

  – equity is the residual interest in the assets of the entity after deducting all its liabilities.

- The concepts of capital and capital maintenance

  The concept of capital maintenance requires that a profit should not be recognized unless a business has at least maintained the amount of its net assets during an accounting period. Capital maintenance is concerned with how an entity defines the capital that it seeks to maintain. It provides the linkage between the concepts of capital and the concepts of profit because it provides the point of reference by which profit is measured; it is a prerequisite for distinguishing between an entity's return on capital and its return of capital; only inflows of assets in excess of amounts needed to maintain capital may be regarded as profit and therefore as a return on capital.

  Profit is therefore the residual amount that remains after expenses (including capital maintenance adjustments, where appropriate) have been deducted from income.

In order to meet their objectives for financial reporting, the IASB requires that financial statements be prepared on the accrual basis of accounting. That is that transactions are recorded at the time they are agreed, rather than at the time that cash or cash equivalents change hands. The accrual accounting methodology requires entities to understand the relationship between their investment (physical assets) and the delivery of the required value, to that entity. This provides a better basis for assessing the entity's past and future performance than information solely about cash receipts and payments during that period.

4.6 IEC dependability suite

4.6.1 Overview

The IEC dependability suite of standards provides technical guidance on managing dependability and on the tools and techniques to achieve availability, reliability, maintainability and supportability of assets. The standards also provide guidance on the measurement and assurance of dependability characteristics.

4.6.2 Dependability principles

The concept of dependability describes the extent to which something can be trusted to behave as expected. Dependability is used as a collective term for four, time-dependent, characteristics: availability, reliability, maintainability and supportability, which are capabilities to be achieved under given conditions of organizational use. As well as these objectively measureable characteristics, the concept of dependability includes more subjective judgements of trustworthiness relating to the functions required by particular stakeholders.

Dependability is an important aspect of asset management in that it is the ability of an asset to perform as and when required. It is thus the ability to fulfil requirements and expectations consistently over time. It includes the ability to meet requirements under normal and expected conditions and the ability to adapt to unexpected changes in requirements, assumptions and circumstances and to recover from failures.

4.6.3 Dependability management

Achieving dependability requires effective planning and implementation of dependability related activities throughout the asset life cycle through a tailored dependability programme.

Dependability management is described in IEC 60300-1 and involves the following elements:

- organizational arrangements to implement dependability policies and objectives,
- dependability processes, activities and tasks that are tailored to the context, objectives and risks and implemented in the dependability programme, and
- performance evaluation and improvement arrangements.

Dependability activities involve the use of tools and techniques to

- identify risks to functional and non-functional objectives and to dependability requirements, and to decide how to treat them,
- analyse failures,
- measure dependability or its characteristics, and
- provide assurance concerning dependability and its management.

IEC 60300-3-15 gives guidance on the engineering of a system to achieve its dependability objectives. It describes a process for realization of dependability through the system life cycle integrated into technical processes of systems engineering.

A summary of each of the standards in the dependability suite can be found on the IEC dependability website at http://tc56.iec.ch/about/standards0_1.htm.

5 Technical and financial standards for an AMS

5.1 Integration of technical and financial standards for asset management

As advocated by the ISO 5500x suite, asset management integrates the financial and engineering disciplines to facilitate its prime function of supporting risk based decision-making. However, the AMS described within ISO 55001 deliberately does not include information about the use of specific technical or financial standards to support the management of assets.

The technical standards provided by the IEC dependability suite offer industry existing good practice standards to use and tailor for each life cycle stage, as well as providing standards that apply over the life cycle, such as life cycle costing.

The IFRS and IAS published by the IASB provide good practice standards relevant to asset management financial decision making and reporting.

Asset management integrates technical and financial decision making, hence both sets of standards (IEC dependability and IFRS and IAS) are relevant to asset management as applied through the lens of the systems engineering lifecycle processes standard ISO/IEC/IEEE 15288.

The ability to integrate technical, system and financial standards (for asset management) requires a ‘top down – bottom up’ approach, namely to provide the following links between the:

- requirements of the AMS and the process requirements of the life cycle process standard ISO/IEC/IEEE 15288, and
- process requirements of the life cycle process standard ISO/IEC/IEEE 15288 and the requirements/procedures in IEC dependability standards and IFRS and IAS financial standards.

5.2 Relating AMS to systems engineering

Within the AMS elements of ISO 55001 shown in Figure 2 is an element called “Process management”. Within this element, the technical and financial processes used to support asset management are identified, developed, produced and approved, implemented, supported, evolved and retired. Systems engineering can provide key managerial and technical support in the identification of the technical processes within the AMS.

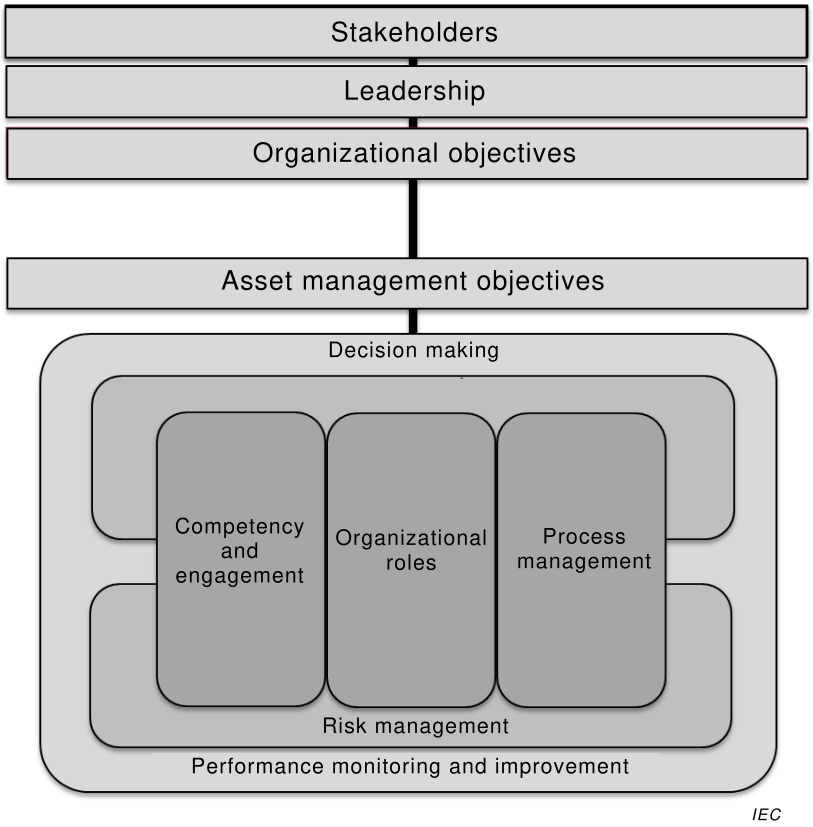

Figure 2 – Elements of an AMS

The ISO 55001 requirements for an AMS can be mapped to the relevant ISO/IEC/IEEE 15288 technical processes as shown in Annex B. The mapping shown in Annex B is indicative only and needs to be tailored for relevance to each specific business and risk context.

5.3 Mapping system life cycle processes to dependability standards and IFRS and IAS standards

Figure 3 represents a typical set of life cycle stages and associated processes useful for managing assets.

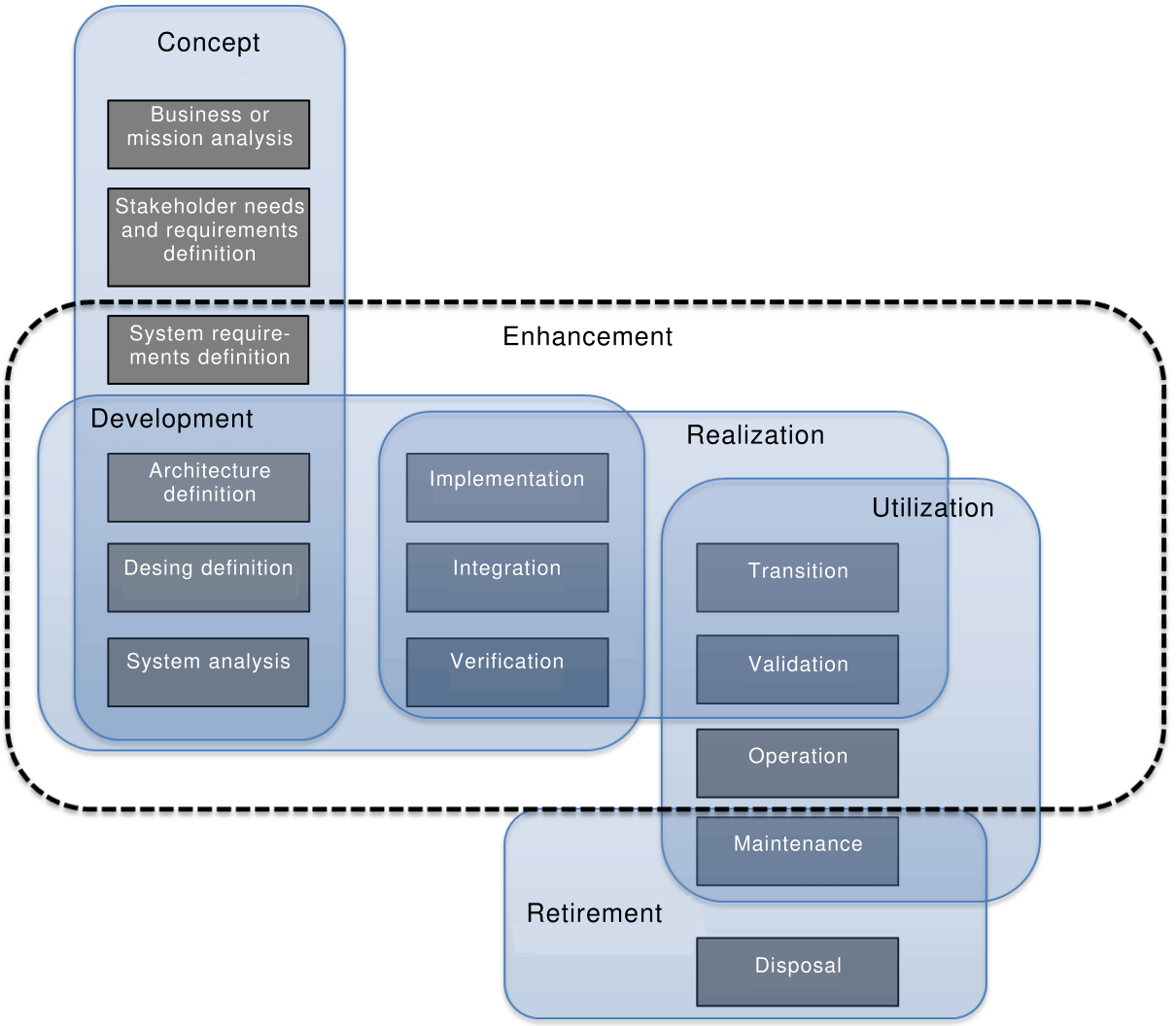

Figure 3 – Set of technical processes used for managing assets

Figure 3 is derived from ISO/IEC/IEEE 15288 and maps the ISO/IEC/IEEE 15288 technical processes to the six life cycle stages listed in IEC 60300-1, namely:

- concept,
- development,
- realization,
- utilization,
- enhancement, and
- retirement.

NOTE 1 Realization includes the implementation, verification, integration and validation processes along with the transition process, which prepares the system for operation and maintenance.

NOTE 2 Support as a discrete activity is not mentioned specifically in ISO/IEC/IEEE 15288 but is considered to be part of all listed processes.

These life cycle stages can be associated with a number of national and international standards from the IFRS and IAS and dependability suites. Annex C provides indicative mapping that documents the relationship between ISO/IEC/IEEE 15288 and the dependability and IFRS and IAS standards.

6 Intended use of the information provided in this Technical Specification

This Technical Specification shows how the IEC dependability suite of standards and the IFRS suite of standards can support the requirements of asset management, as described by ISO 55000, and of an AMS as described by ISO 55001.

Annexes B and C provide guidance for the identification of the technical and financial processes to be used within an AMS, by:

- identifying and tailoring the system life cycle processes relevant to the business context and scope, as described by the requirements of the AMS, which is documented within their strategic asset management plan,
- identifying and tailoring relevant IEC dependability standards (and associated processes) relevant to those system life cycle processes, and
- identifying the relevant IFRS standards (and associated process) that may be relevant to those system life cycle processes.

Annex A
(informative)

International IFRS and IAS information

Table A.1 – International IFRS and IAS information

IFRS and IAS	Title	Scope
IFRS 3	Business Combinations	Outlines the accounting procedures when an acquirer obtains control of a business (e.g. an acquisition or merger). Such business combinations are accounted for using the 'acquisition method', which generally requires assets acquired and liabilities assumed to be measured at their fair values at the acquisition date.
IFRS 7	Financial Instruments: Disclosures	Requires disclosure of information about the significance of financial instruments to an entity, and the nature and extent of risks arising from those financial instruments, both in qualitative and quantitative terms. Specific disclosures are required in relation to transferred financial assets and a number of other matters.
IFRS 8	Operating Segments	Requires particular classes of entities (essentially those with publicly traded securities) to disclose information about their operating segments, products and services, the geographical areas in which they operate, and their major customers. Information is based on internal management reports, both in the identification of operating segments and measurement of disclosed segment information.
IFRS 9	Financial Instruments	Requirements for recognition and measurement, de-recognition, and hedge accounting. The IASB is adding to the standard as it completes the various phases of its comprehensive project on financial instruments, and so it will eventually form a complete replacement for IAS 39 Financial Instruments: Recognition and Measurement.
IFRS 13	Fair Value Measurement	Applies to IFRSs that require or permit fair value measurements or disclosures and provides a single IFRS framework for measuring fair value and requires disclosures about fair value measurement. The standard defines fair value on the basis of an ‘exit price' notion and uses a 'fair value hierarchy', which results in a market-based, rather than entity-specific, measurement.
IAS 8	Accounting Policies, Changes in Accounting Estimates and Errors	Applied in selecting and applying accounting policies, accounting for changes in estimates and reflecting corrections of prior period errors. The standard requires compliance with any specific IFRS applying to a transaction, event or condition, and provides guidance on developing accounting policies for other items that result in relevant and reliable information. Changes in accounting policies and corrections of errors are generally retrospectively accounted for, whereas changes in accounting estimates are generally accounted for on a prospective basis.
IAS 16	Property, Plant and Equipment	Outlines the accounting treatment for most types of property, plant and equipment. Property, plant and equipment is initially measured at its cost, subsequently measured, either using a cost or revaluation model, and depreciated so that its depreciable amount is allocated on a systematic basis over its useful life.
IAS 17	Leases	Prescribes the accounting policies and disclosures applicable to leases, both for lessees and lessors. Leases are required to be classified as either finance leases (which transfer substantially all the risks and rewards of ownership, and give rise to asset and liability recognition by the lessee and a receivable by the lessor) and operating leases (which result in expense recognition by the lessee, with the asset remaining recognized by the lessor).
IAS 21	The Effects of Changes in Foreign Exchange Rates	Outlines how to account for foreign currency transactions and operations in financial statements, and also how to translate financial statements into a presentation currency. An entity is required to determine a functional currency (for each of its operations if necessary) based on the primary economic environment in which it operates and generally records foreign currency transactions using the spot conversion rate to that functional currency on the date of the transaction.

IFRS and IAS	Title	Scope
IAS 36	Impairment of Assets	Seeks to ensure that an entity's assets are not carried at more than their recoverable amount (i.e. the higher of fair value less costs of disposal and value in use). With the exception of goodwill and certain intangible assets for which an annual impairment test is required, entities are required to conduct impairment tests where there is an indication of impairment of an asset, and the test may be conducted for a 'cash-generating unit' where an asset does not generate cash inflows that are largely independent of those from other assets.
IAS 37	Provisions, Contingent Liabilities and Contingent Assets	Outlines the accounting for provisions (liabilities of uncertain timing or amount), together with contingent assets (possible assets) and contingent liabilities (possible obligations and present obligations that are not probable or not reliably measurable). Provisions are measured at the best estimate (including risks and uncertainties) of the expenditure required to settle the present obligation, and reflects the present value of expenditures required to settle the obligation where the time value of money is material.
IAS 39	Financial Instruments: Recognition and Measurement	Outlines the requirements for the recognition and measurement of financial assets, financial liabilities, and some contracts to buy or sell non-financial items. Financial instruments are initially recognized when an entity becomes a party to the contractual provisions of the instrument, and are classified into various categories depending upon the type of instrument, which then determines the subsequent measurement of the instrument (typically amortized cost or fair value). Special rules apply to embedded derivatives and hedging instruments.

Annex B
(informative)

Mapping ISO 55001 AMS requirements to ISO/IEC/IEEE 15288 system life cycle processes

Table B.1 – Mapping ISO 55001 AMS requirements to ISO/IEC/IEEE 15288 system life cycle processes

ISO/IEC/IEEE 15288:2015 System lifecycle processes (technical)		Acquisition 6.1.1	Supply 6.1.2	Life Cycle Model 6.2.1	Infrastructure 6.2.2	Portfolio 6.2.3	Human Resource 6.2.4	Quality 6.2.5	Knowledge 6.2.6	Project Planning 6.3.1	Project Assessment and Control 6.3.2	Decision Management 6.3.3	Risk Management 6.3.4	Configuration Management 6.3.5	Information Management 6.3.6	Measurement 6.3.7	Quality Assurance 6.3.8	Business or Mission Analysis 6.4.1	Stakeholder Needs & Requirements Definition 6.4.2	System Requirements Definition 6.4.3	Architecture Definition 6.4.4	Design Definition 6.4.5	System Analysis 6.4.6	Implementation 6.4.7	Integration 6.4.8	Verification 6.4.9	Transition 6.4.10	Validation 6.4.11	Operation 6.4.12	Maintenance 6.4.13	Disposal 6.4.14
ISO 55001 Sections		Agreement Processes		Organisational Project-Enabling Processes						Technical Management Processes								Technical Processes													
4.1	Understanding the organisation																													
4.2	Understanding stakeholder needs	O	O					O		O	O	O	O	O	O	O	O	O								O	O		O	O	O
4.3	Determining AM System Scope	O	O	O				O	O									O		O	O	O	O				O				
4.4	Asset management System	O	O	O	O	O		O	O	O	O	O	O	O	O			O	O	O	O	O	O	O	O	O	O	O	O	O	O
5.1	Leadership and Commitment	O	O				O												O				O		O		O		O	O	O
5.2	Policy	O	O																												
5.3	Organisational roles/responsibilities	O	O				O	O		O	O	O	O							O	O	O	O		O		O		O	O	O
6.1	Actions to address risk/opportunities							O	O	O	O	O	O																		
6.2.1	Asset management objectives	O	O	O				O	O			O	O	O	O	O	O	O	O	O			O		O						
6.2.2	Planning to achieve objectives	O	O	O	O	O		O	O	O	O	O	O	O	O	O	O	O	O	O	O	O		O	O	O	O		O	O	O
7.1	Support Resources	O	O	O		O	O	O	O	O	O		O	O	O	O	O	O	O	O	O	O	O			O	O	O	O	O	O
7.2	Support Competence						O			O	O		O	O	O	O	O									O	O	O	O	O	O
7.3	Support Awareness									O	O															O	O	O	O	O	O
7.4	Support Communications									O	O															O	O	O	O	O	O
7.5	Support Information requirements	O	O					O	O	O	O							O	O	O	O	O	O			O	O	O	O	O	O
7.6.1	Documented information - General	O	O					O	O	O	O									O	O	O	O			O	O	O	O	O	O
7.6.2	Creating and updating	O	O					O	O	O	O									O	O	O	O			O	O	O	O	O	O
7.6.3	Control of documented information							O	O											O	O	O	O			O	O	O	O	O	O
8.1	Operational planning and control			O	O	O	O	O	O	O	O		O	O	O	O	O	O		O	O	O	O	O	O	O	O	O	O	O	O
8.2	Management of change							O	O	O			O	O	O	O	O	O		O	O	O	O	O		O	O	O	O	O	O
8.3	Outsourcing	O	O	O	O		O	O	O	O			O	O	O	O	O	O		O	O	O	O	O		O	O	O	O	O	O
9.1	Monitor/measure/analysis/evaluate								O						O	O	O			O		O	O	O		O	O	O			
9.2	Internal audit	O	O	O				O	O							O	O			O		O		O	O	O	O	O	O	O	O
9.3	Management review	O	O	O	O	O	O			O						O	O			O		O		O	O	O	O		O	O	
10.1	Nonconformity and corrective action	O	O													O	O			O		O		O		O	O		O	O	
10.2	Preventive action			O	O	O		O	O							O	O			O		O				O	O		O	O	
10.3	Continual improvement	O	O	O	O	O		O	O							O	O			O	O	O	O	O		O	O		O	O	O

Annex C
(informative)

Mapping ISO/IEC/IEEE 15288 processes to IEC dependability and IFRS and IAS standards

Annex C provides examples of how IEC dependability and IFRS standards can be applied within all the processes of ISO/IEC/IEEE 15288 (see Tables C.1, C.2, C.3 and C4.

Table C.1 – Agreement processes

Agreement management processes and ISO/IEC/IEEE 15288:2015 subclause number	IEC standard number and name	IFRS number and name
Acquisition process 6.1.1		
Supply process 6.1.2		

Table C.2 – Organizational project enabling processes

Organizational management processes and ISO/IEC/IEEE 15288:2015 subclause number	IEC standard number and name	IFRS number and name
Life cycle model management process 6.2.1	IEC 60300-1 Dependability management – Part 1: Guidance for management and application	IFRS Taxonomy Guide 2013 IFRS 13 Fair Value Measurement
Infrastructure management process 6.2.2		IFRS 3 Business Combinations IFRS 7 Financial Instruments: Disclosures IFRS 8 Operating Segments IFRS 9 Financial Instruments
Portfolio management process 6.2.3		IFRS 3 Business Combinations IFRS 7 Financial Instruments: Disclosures IFRS 8 Operating Segments IFRS 9 Financial Instruments
Human resource management process 6.2.4		
Quality management process 6.2.5	IEC 60300-1 Dependability management – Part 1: Guidance for management and application	IFRS Taxonomy Guide 2013
Knowledge management process 6.2.6		

Table C.3 – Technical management processes

Technical management processes and ISO/IEC/IEEE 15288:2015 subclause number	IEC standard number and name	IFRS number and name
Project planning process 6.3.1	IEC 62198 Managing risk in projects – Application guidelines	
Project assessment and control processes 6.3.2	None	
Decision management processes 6.3.3	IEC 60300-3-1 Dependability management – Part 3-1: Application guide – Analysis techniques for dependability – Guide on methodology IEC 60300-3-3 Dependability management – Part 3-3: Application guide – Life cycle costing	IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors IAS 16 Property, Plant and Equipment IAS 17 Leases IAS 21 The Effects of Changes in Foreign Exchange Rates IAS 36 Impairment of Assets IAS 37 Provisions, Contingent Liabilities and Contingent Assets IAS 39 Financial Instruments: Recognition and Measurement
Risk management process 6.3.4	IEC 62198 Managing risk in projects – Application guidelines ISO/IEC 31010 Risk management – Risk assessment techniques	
Configuration management process 6.3.5	None	
Information management processes 6.3.6	None	

Technical management processes and ISO/IEC/IEEE 15288:2015 subclause number	IEC standard number and name	IFRS number and name
Measurement process 6.3.7	IEC 60605-2 Equipment reliability testing – Part 2: Design of test cycles IEC 60605-4 Equipment reliability testing – Part 4: Statistical procedures for exponential distribution – Point estimates, confidence intervals, prediction intervals and tolerance intervals IEC 60300-3-5 Dependability management – Part 3-5: Application guide – Reliability test conditions and statistical test principles IEC 60605-6 Equipment reliability testing – Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity IEC 60706-3 Maintainability of equipment – Part 3: Verification and collection, analysis and presentation of data IEC 61070 Compliance test procedures for steady-state availability IEC 61123 Reliability testing – Compliance test plans for success ratio IEC 61124 Reliability testing – Compliance tests for constant failure rate and constant failure intensity IEC 61710 Power law model – Goodness-of-fit tests and estimation methods IEC 62308 Equipment reliability – Reliability assessment methods IEC 62309 Dependability of products containing reused parts – Requirements for functionality and tests IEC PAS 62814 Dependability of software products containing reusable components – Guidance for functionality and tests IEC 62429 Reliability growth – Stress testing for early failures in unique complex systems IEC 62506 Methods for product accelerated testing	IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors IAS 16 Property, Plant and Equipment IAS 21 The Effects of Changes in Foreign Exchange Rates IAS 36 Impairment of Assets IAS 37 Provisions, Contingent Liabilities and Contingent Assets IAS 39 Financial Instruments: Recognition and Measurement
Quality assurance process 6.3.8	None	

Table C.4 – Technical processes (continued)

ISO/IEC/IEEE 15288:2015 Processes		Agreement		Organizational Project-Enabling						Technical Management Processes								Technical Processes												
		Acquisition 6.1.1	Supply 6.1.2	Life Cycle Model 6.2.1	Infrastructure 6.2.2	Portfolio 6.2.3	Human Resource 6.2.4	Quality 6.2.5	Knowledge 6.2.6	Project Planning 6.3.1	Project Assessment and Control 6.3.2	Decision Management 6.3.3	Risk Management 6.3.4	Configuration Management 6.3.5	Information Management 6.3.6	Measurement 6.3.7	Quality Assurance 6.3.8	Business or Mission Analysis 6.4.1	Stakeholder Needs & Requirements Definition 6.4.2	System Requirements Definition 6.4.3	Architecture Definition 6.4.4	Design Definition 6.4.5	System Analysis 6.4.6	Implementation 6.4.7	Integration 6.4.8	Verification 6.4.9	Transition 6.4.10	Validation 6.4.11	Operation 6.4.12	Maintenance 6.4.13	Disposal 6.4.14
IEC Dependability Standards																														
60300-1	Dependability management			o																		o			o					
60300-2	Guidance for dependability management			o																										
60300-3-1	Dependability analysis techniques											o																		
60300-3-2	Collection of dependability data																								o		o	o	o	
60300-3-3	Life cycle costing											o					o			o										
60300-3-4	Specification of dependability reqts																	o	o											
60300-3-5	Reliability test conditiions and statistical data															o									o		o			
60300-3-10	Maintainability and supportability																		o	o								o	o	
60300-3-11	Reliability centered maintenance																				o				o				o	
60300-3-12	Integated logistic support																				o				o				o	
60300-3-14	Maintenance and maintenance support																		o										o	
60300-3-15	Engineering of system dependability			o						o							o				o									
60300-3-16	Specifying maintenance support services																									o			o	
60319	Reliability data for electronic components															o						o								
60410	Sampling plans and procedures															o														
60605-2	Reliability testing - Design of test cycles															o									o					
60605-4	Statistical procedures for exponential distributions															o									o					
60605-6	Tests for constant failure rate and intensity															o									o			o		
60706-2	Maintainability during design																			o	o									

ISO/IEC/IEEE 15288:2015 Processes		Acquisition 6.1.1	Supply 6.1.2	Life Cycle Model 6.2.1	Infrastructure 6.2.2	Portfolio 6.2.3	Human Resource 6.2.4	Quality 6.2.5	Knowledge 6.2.6	Project Planning 6.3.1	Project Assessment and Control 6.3.2	Decision Management 6.3.3	Risk Management 6.3.4	Configuration Management 6.3.5	Information Management 6.3.6	Measurement 6.3.7	Quality Assurance 6.3.8	Business or Mission Analysis 6.4.1	Stakeholder Needs & Requirements Definition 6.4.2	System Requirements Definition 6.4.3	Architecture Definition 6.4.4	Design Definition 6.4.5	System Analysis 6.4.6	Implementation 6.4.7	Integration 6.4.8	Verification 6.4.9	Transition 6.4.10	Validation 6.4.11	Operation 6.4.12	Maintenance 6.4.13	Disposal 6.4.14
IEC Dependability Standards		**Agreement**		**Organizational Project-Enabling**						**Technical Management Processes**								**Technical Processes**													
60706-3	Verification of maintainability data															o									o		o		o	
60706-5	Testability and diagnostic testing																			o									o	
60812	Failure mode and effects analysis																		o		o									
61014	Programs for reliability growth																				o				o					
61025	Fault tree analysis																				o							o	o	
61070	Compliance test procedures for steady state availability																								o		o			
61078	Reliability block diagrams and Boolean methods																				o									
61123	Compliance test plans for success ratio															o									o					
61124	Compliance test for constant failure rate															o									o					
61160	Design reviews																		o	o	o				o					
61163-1	Reliability stress screening Repairable assemblies																					o								
61163-2	Reliability stress screening Electronic components																					o								
61164	Reliabiity growth Statistical methods																								o					
61165	Application of Markov techniques																				o									
61649	Weibull analysis																				o				o					
61650	Comparison of two constant failure rates															o					o				o					
61703	Mathematical expressions for RAMS																				o									
61709	Rreliability prediction from failure rate data																				o									
61710	Power law model - goodness of fit															o									o			o		

ISO/IEC/IEEE 15288:2015 Processes	Agreement		Organizational Project-Enabling								Technical Management Processes										Technical Processes													
IEC Dependability Standards	Acquisition 6.1.1	Supply 6.1.2	Life Cycle Model 6.2.1	Infrastructure 6.2.2	Portfolio 6.2.3	Human Resource 6.2.4	Quality 6.2.5	Knowledge 6.2.6	Project Planning 6.3.1	Project Assessment and Control 6.3.2	Decision Management 6.3.3	Risk Management 6.3.4	Configuration Management 6.3.5	Information Management 6.3.6	Measurement 6.3.7	Quality Assurance 6.3.8	Business or Mission Analysis 6.4.1	Stakeholder Needs & Requirements Definition 6.4.2	System Requirements Definition 6.4.3	Architecture Definition 6.4.4	Design Definition 6.4.5	System Analysis 6.4.6	Implementation 6.4.7	Integration 6.4.8	Verification 6.4.9	Transition 6.4.10	Validation 6.4.11	Operation 6.4.12	Maintenance 6.4.13	Disposal 6.4.14
61882	Hazard and operability studies - HAZOP								o												o											
61907	Communication network dependability engineering																		o													
62198	Managing risk in projects								o	o	o	o					o															
62308	Equipment reliability assessment methods										o										o			o								
62309	Reused parts - Functional test requirements										o													o								o
62347	Guidance on system dependability specs.																	o	o													
62380	Reliability data handbook for electronics																					o										
62402	Obsolescence management																		o	o	o											o
62429	Reliability growth - stress testing for early failures										o													o		o						
62502	Event tree analysis																				o											
62506	Methods for accelerated stress testing										o													o								
62508	Human aspects of dependability										o							o		o	o											
62551	Petri net analysis techniques																				o											
62628	Software aspects of dependability																			o	o											
62673	Communication network dependability assurance																			o	o											o
62740	Root Cause Analysis																o															o
62741	Demonstration of dependability requirements - Dependability case										o						o							o								o
62814	Software products with reusable components																			o	o											
31010	Risk management - Risk assessment techniques									o												o										

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