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Engineering services — Terminology to describe engineering services for industrial products

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National foreword

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Engineering services - Terminology to describe engineering services for industrial products

Services d'ingénierie - Terminologie destinée à décrire les services d'ingénierie pour les produits industriels

Ingenieurdienstleistungen - Terminologie zur Beschreibung von Ingenieurdienstleistungen für industrielle Produkte

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

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Foreword

This document (EN 16311:2013) has been prepared by Technical Committee CEN/TC 395 “Engineering consultancy services”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

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Introduction

Reference vocabulary intends to facilitate the dialogue between partners of different countries or specialities. It cannot be considered as a reference list of tasks to be carried out, which depend on contexts that may differ in different European countries and sectors (legislation, regulation insurances….).

The terms that are incorporated in the glossary are in line with those developed by CEN/TC 395 for other industries in particular in the standard EN 16310 "Engineering services — Terminology to describe engineering services for buildings, infrastructure and industrial facilities".

Each project is managed through a series of stages and therefore staging is important for the management of engineering services. However, the standard stages in projects and related national plans of work of engineering service providers differ from country to country and may also be subject to differences in legislation. For this reason, it is not the intention of this standard to harmonise national or private plans of work. However, in cross border operations and co-operations, it is important that all parties concerned have a common view on the actual staging and the engineering activities that take place within each stage. To facilitate this, some information about the stages in the life cycle of an industrial product is given in Annex A. This annex may offer a common reference framework to which end users and engineering service providers can ‘map’ their project-specific scope of work in cross border projects, specifying what is included and explicitly excluded in their contracts.

1 Scope

This European Standard contains a glossary of terms, which can contribute to the conditions for free competition and a level playing field for engineering services providers in Europe in regard to industrial products.

This European Standard deals with the intellectual services necessary to transform needs into practical solutions from their conception, through realisation to operation and during the life cycle of a working product such as buildings, industrial products etc.

The terminology aims at facilitating the cooperation between partners in the field of Engineering Services (ES).

Its structure is based on stages in the life cycle of an industrial product. It is not a description of the contents of the tasks to be executed, neither on their scheduling, nor on the actors concerned who depend on the national context, the clients, type and importance of the product and its environment.

The major terms are defined covering the lifecycle of industrial products. These terms are applicable to all sectors, for example: aerospace, automotive, capital equipment.

2 Terms and definitions

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

2.1
engineering
intellectual activities necessary to define, design, produce, sustain and recycle a product, a process or a building

2.2
engineering services
intellectual tasks provided during one or all stages of the life cycle of the product, a process or a built asset by specialised (or trained) professionals

2.3
contract
legally binding agreement specifying the services and conditions between all parties

2.4
life cycle
all stages in the life span of a built asset or product

2.5
stage
period within the life cycle of an entity that relates to the state of its initiation, design, implementation, operation, and end of life

2.6
project management
application of methods, tools, techniques and competencies to a project

[SOURCE: ISO/FDIS 21500:2012, 3.3]

2.7
configuration management
coordinated activities to direct and control configuration

[SOURCE: ISO 10007:2003, 3.6]

2.8
quality assurance
all activities focused on providing confidence that quality requirements will be fulfilled

2.9
product
any goods or service

[SOURCE: EN ISO 14021:2001, 3.1.11]

Annex A
(informative)

Stages in the life cycle of an industrial product

A.1 General

This annex describes the stages and sub-stages in the life cycle of an industrial product. The description is intended to be a reference framework onto which end-users and engineering service providers can 'map' their project-specific scopes of work in cross border projects, specifying what is explicitly included and mainly excluded in their contracts. It is emphasised that it is not intended to harmonise national plans of work of architects and consulting engineers. The aim is just to provide a reference for tuning the contributions of participants from different countries in building projects in the EU.

A stage is a period within the life cycle of an entity that relates to the state of its initiation, design, implementation, operation, and end of life.

A.2 Staging

The distinction of stages in the life cycle of a product is important for the management and assessment of engineering services. The main characteristics of the staging are listed below.

— Each (sub) stage has its own characteristic and represents a vital step in the life cycle of the industrial product.

— Each stage represents a specific state of the product asset. The client or owner decides on the transition from one stage to the other on the basis of an assessment of e.g. cost, organisational aspects, time, documentation, quality, risk and environmental impact.

— A project may apply to one or more stages in the life cycle of the product.

— The sequence of some sub-stages within the main stages may vary from sector to sector and/or from country to country.

The functional stages in the life cycle of an industrial product are shown in Figure A.1. The stages and sub-stages are further described in Table A.1.

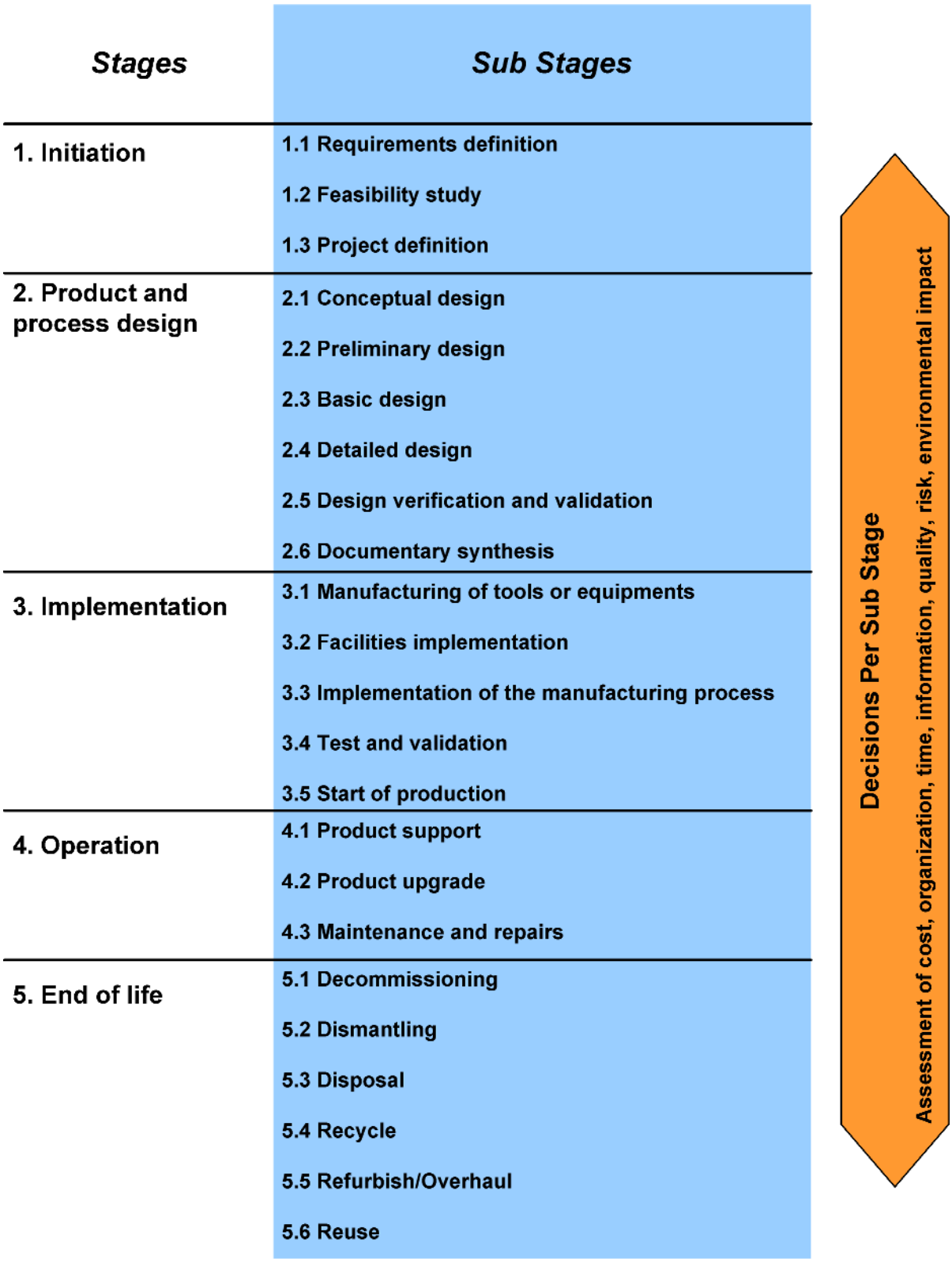

Figure A.1 — Stages and sub stages in the life cycle of an industrial product

A.3 Stages and sub-stages

Table A.1 gives information about how stages and sub-stages could be used.

Table A.1 — Stages and sub-stages in the life cycle of an industrial product *(1 of 3)*

	Stages and sub stages	Definitions
1	**Initiation**	Early stage within a project where the context of the potential product to be developed is identified and the requirements defined.
1.1	Requirements definition	The process of interrogating all stakeholders to confirm that all requirements of users, internal team members and others are understood.
1.2	Feasibility study	Study to see if a concept is practical and can be developed into a useful working product or service at an acceptable cost and with minimised adverse environmental impact.
1.3	Project definition	Statement that describes the requirements and restraints of the product design to those responsible for carrying out design.
2	**Product and process design**	Stage where defined requirements are transformed into specified characteristics or into the specification of a product, a process or a system agreed before its implementation.
2.1	Conceptual design	To develop options and solutions to determine the main outline of the product, the process or the system.
2.2	Preliminary design	Study leading to one or more general solutions, together with specifications.
2.3	Basic design	Study examining in greater depth the preferred solution chosen, the estimation of its cost and realisation time which leads to a technical and acceptable specification.
2.4	Detailed design	Study specifying the precise shape, dimensions and tolerances, selecting the materials and considering the manufacturing methods for every individual part of the product and all data required.
2.5	Design verification and validation	Demonstrating that the design meets the functional and technical requirements.
2.6	Documentary synthesis	Drawings, models, files etc. necessary to implement the design and operate the product throughout its life cycle.

Table A.1 — Stages and sub stages in the life cycle of an industrial product *(2 of 3)*

	Stages and sub stages	Definitions
3.	**Implementation**	The process of conversion of a design to a developed product including the development of manufacturing process, testing and preparation for production.
3.1	Manufacturing of tools or equipment	All activities of manufacturing for the tools or equipment developed. (To buy equipment's components, from purchase of equipment's and/or components to the delivery on final production site.)
3.2	Facilities implementation	Construction of building, infrastructure and utilities needed for production.
3.3	Implementation of the manufacturing process	Installation of production and assembly lines.
3.4	Test and validation	Rigorous methodology that allows conducting all tests to ensure the performance of the process and product. During this phase, the training of technical operating staff and maintenance is carried out.
3.5	Start of production	The action of making or manufacturing from components or raw materials, or the process of being so manufactured.
4.	**Operation**	The stage in which the product is being used, maintained, upgraded and repaired.
4.1	Product support	All activities that are conducted in parallel during the production period e.g. maintenance, continuous improvement activities, process re-engineering and any activities associated with life extension.
4.2	Product upgrade	New release of the product with enhancements, new functionality and sometimes a new design or release of a standard product for an alternative use.
4.3	Maintenance and repairs	All activities which have the objective of retaining or restoring an item in or to a state in which it can perform its required function.

Table A.1 — Stages and sub stages in the life cycle of an industrial product *(3 of 3)*

	Stages and sub stages	Definitions
5.	**End of life**	Ultimate destination of an industrial product after its use.
5.1	Decommissioning	The process whereby an industrial product is safely taken out of active service and prepared for safe storage or inactive life.
5.2	Dismantling	The process whereby a decommissioned industrial product is reduced to a group of component parts or sub-assemblies in preparation for safe disposal or reuse.
5.3	Disposal	The process whereby a dismantled industrial product is removed either to a place for environmentally acceptable long term storage (including landfill), or made available for recycling.
5.4	Recycle	All activities concerning the reuse of materials, products, equipment, parts etc. gained through a dismantling process.
5.5	Refurbish/Overhaul	The process whereby an industrial product is returned to a usable condition, possibly with enhanced capabilities as an alternative to disposal.
5.6	Reuse	To use an industrial product more than once rather than removing it from service without refurbishing.

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