

Plan

ITER Document Breakdown Structure Overview

This document gives an overview description of the Document Breakdown Structure (DBS) in order to organize a common classification for ITER engineering data.

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1 Purpose

The object of this document is to propose a classification of ITER engineering data for design, manufacturing and commissioning of systems and components to be supplied by the Project.

2 Scope

This document is applicable for all ITER engineering data.

3 Definitions and acronyms

3.1 Definitions

Word	Definition	Example/Comment
Document Breakdown Structure (DBS)	The DBS is not a monolithic tree structure but a set of engineering data categorized by topics (e.g. Requirements, Interfaces, Manufacturing, Safety...) <u>attached</u> at each node of the PBS and each design milestone.	
Component	Any hardware which has to be “visible” by the operator for operation or maintenance.	A valve on a loop, a temperature sensor in a given room, overcurrent protection on a motor,... <i>All components shall be named using ITER numbering system linked to the PBS and are normally identified on a functional diagram.</i>
Engineering data	Technical documents in a broad sense representing not only documents (paper copy) but also any electronic information or its medium (radiographic film,...)	PS, SRD, diagrams (PFD, P&ID, single-line diagram, I&C signals, measurements, analyses...) or 3D models. <i>Engineering data can be relevant at plant level and/or system level.</i>
End-item	A final combination of end products, component parts, and/or materials that is ready for its intended use.	
Folder	Group of engineering data/documents	Manufacturing and Inspection folder (MIF) is a “Folder” collecting engineering data needed for acceptance of the product.
Part (1)	Element of a component or the component itself, seen as elementary procurement item.	Catalogue or purpose-made component.
Product	Generic term meaning each PBS item or any group of them.	<i>A product is a measurable output of an activity</i>
Qualification	Set of tasks contributing to provide proofs, while basing on theoretical and experimental justifications, that	Simulation, tests, analyses

	the defined product satisfies the specified need and can be produced.	
System - Subsystem	In the frame of SEMP, “System” refers to the PBS node [level 1 or 2] where a set of requirement document exist (SRD, ICDs)	At present 86 “systems/SRD” are defined to cover the whole ITER PBS. <i>The word “system” may actually refer to a subsystem, like in the case of Diagnostics, where the Diagnostics system contains about 50 individual diagnostic sub-systems.</i>

(1) A part is any hardware item which cannot be disassembled without destroying the capability to perform its required function.

3.2 Acronyms

See also other acronyms definition in Table Section 6.

BOM	Bill of Materials
DBS	Document Breakdown Structure
PBS	Product Breakdown Structure
EDB	Engineering Database
PR	Project Requirements
QA	Quality Assurance
RAMI	Reliability, Availability, Maintainability, Inspectability
RO	Responsible Officer
SEMP	Systems Engineering Management Plan
SRD	System Requirement Document

4 Applicable documents

[1]	ITER Systems Engineering Management Plan	ITER_D_2F68EX*
[2]	ITER Plant Breakdown Structure (PBS)	ITER_D_28WB2P*

(*) See ITER Document management system for applicable version

5 Goals

This document establishes a common document structure for all the ITER engineering activity. It will evolve as necessary to cope with the ITER Project needs.

The DBS main objectives are to structure engineering data in order:

- To share a common structure for all stakeholders and facilitate data exchange between parties,
- To collect all the engineering data produced during the Project and to establish a technical reference for the Operator or the Regulatory Body,
- To facilitate Configuration management of engineering data,
- To have a set of engineering data categorized by topics, associated with PBS and milestones,

And subsequently:

- To inform ITER stakeholders as soon as possible about engineering data to be produced in order to facilitate contractual discussions,
- To limit and fix the number of engineering data to be produced: e.g. a new version of a document should be released instead of creating a new document,
- To make easier the document management within the EDB,
- To facilitate coordination tasks, especially for a better control of design and work execution,
- To obtain a final “Engineering Documentation Package”, organized and in line with technical processes (see [1]),
- To harmonize and facilitate exchange of data between all the different systems, products or work packages of the ITER Project.

All these goals are general in a Document Breakdown Structure.

In the ITER context this DBS shall bring the following essentially notions that will improve the Current Configuration Documentation Map:

- **Capturing a complete view of engineering data to be delivered.**
- **Planning and structuring the engineering data production consistently with the project phases deliverables,**
- **Providing a way to select engineering data according to the phase, technical discipline and PBS node**

6 DBS structure

The engineering data breakdown structure will be organized as follows:

<i>"Folder"</i>	<i>Sub "Folder"</i>	<i>Contents</i>
Requirement Folder (RQF)	(1)	Data describing ITER requirements: <i>e.g PR, SRDs,</i>
	Guidelines, Rules Folder (GRF)	Data related to Regulatory Framework and codes & standards (safety & technical data) <i>e.g. Handbooks, Guidelines, Standards, Codes</i>
Interface Folder (ITF)		System interfaces <i>e.g. ICD, IS</i>
Definition Folder (DEF)	(1)	Structured set of documents constituting the response of the product designer (IO/DA/Supplier) to the technical requirements of the applicant (IO), and in which are expressed all the verifiable product characteristics (including the acceptance criteria) and are shown the prescribed processes to produce it. <i>e.g. PBS, DDD, Diagrams, Tech. Specs, BOMs, drawings</i> ...
	Layout Folder (LAF)	Information describing the plant layout (including position of all systems, routing of services and access routes). <i>e.g. CMMs, Layout drawings</i>
	Maintenance, operation, Functioning analysis & studies Folder (MOF)	Information describing principles for operation and maintenance - includes operation and control of the system, personnel intervention required and operating limits and conditions. Information associated with operational situations (normal and incidental/accidental situations) <i>e.g. ILS Plan, HF studies, Operation&Maintenance Plan,</i>

"Folder"	Sub "Folder"	Contents
Definition Justification Folder (DJF)	(1)	Documents gathering the whole information of studies and tests showing that a product compliant with its definition data file meets the specification expressing the need which this product shall satisfy (analyses, tests, etc...). Includes qualification aspects (2). <i>e.g. Engineering analyses, tests on prototypes, Design Compliance Matrix (DCM)</i>
	Regulatory Control Folder (REF)	Regulatory inspections and certificates. <i>e.g. Pressure Equipment Directive (PED/ESPN)</i>
	Test & Commissioning Folder (TCF)	Information (Test specifications, test programs, test results) that demonstrates that an installed system operates as designed/planned individually and in specific groups of interfacing systems. Includes all information to show that ITER overall works as planned/designed. [linked to the validation on site] <i>e.g. On-site test and commissioning plan, Integrated System Test Plan (ISTP)</i>
	Safety, Health Protection and Environment (SAF)	Safety reports, synthesis notes and authorizations (<i>but General Operating Rules</i>) <i>e.g. List of SiC, Qualification Summary Report (QSN)</i>
Manufacturing and Inspection process Folder (MIF)	(1)	Documents to organize the production of product items in conformity with the Definition Data File, and to define and organize the resources and tasks of the acceptance processes such as to guarantee that the product items are made in conformity with the Definition Folder <i>e.g. Manufacturing and Inspection Plans (MIP),</i>
	End-Item Data Package Folder (EIF)	Documents linked to a product item (End Item Data Package) or a batch of production (Batch Data Package) and used to record the actual configuration of the product or batch and to pronounce acceptance (3).[linked to verification at the supplier's]
	Assembly, Installation & Inspection Folder (AIF)	The purpose is equivalent to the End Item Data Package Folder (EIF) but applied, on site, on a group of End Items [linked to verification on-site before commissioning]
Operator Folder (OPF)	(1)	Describe how to operate and maintain <i>e.g. Plans and procedures</i>
	Training Folder (TRF)	Training material and data related to staff qualification.
	Operating Rules and conditions Folder (ORF)	Rules <i>e.g. General Operating Rules</i>
	Operation Procedures Folder (OPR)	<i>e.g. Operation Procedures</i>
	Maintenance Procedures Folder (MPR)	<i>e.g. Maintenance Procedures, spare parts lists</i>
	Product Logbook Folder (PLF)	Record of the various data specific to each product item collected during the operation process. <i>e.g. periodic test and inspection reports</i>
Project Folder (PRO)		Management documents <i>e.g. Schedule, Risk assessments, Workplans, PA...</i>

Note:

(1) Data not classified in a particular sub-folder.

(2) Qualification: Set of tasks contributing to provide proofs, while basing on theoretical and experimental justifications, that the defined product satisfies the specified need and can be produced.

(3) The End Item Data Package or Batch Data Package comprises in particular an inventory of components and equipments at least at user's maintenance level (replaceable items) resulting from the definition data file and, for each one, the manufacturer's identification, part number, reference to the definition document, reference to any definition deviations (waivers) and reference of the inspection document as applicable.

7 DBS evolution

The DBS structure is designed for managing Plant level (ITER Overall) and System level engineering data. During the Project course, folders and sub-folders will be enriched and redistributed as shown below:

