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Guideline (not under Configuration Control)

CAD Manual 05 - Design Data Management

CAD Manual Section 05 describes & specifies the processes and rules for data and lifecycle management around VPM ENOVIA/LCA tools. This section of the CAD manual is applicable for all CAD Designers of the IO-DO, DA-DO & the Supplier's Design Office using CV5 & EV5.

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CAD Manual 05 - Design Data Management (249WSM_v2_0)	v2.0	In Work	04 Nov 2007	
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5 Design Data Management

5.1 Purpose

This document is to specify processes and rules for data and lifecycle management around VPM ENOVIA/LCA tools.

5.2 Scope

This section of the CAD manual is applicable for all CAD Designers of the IO-DO, DA-DO & the Supplier's Design Office using CV5 & EV5.

This version of section 5 reflects the implementation of ENOVIA & CATIA at the time of writing. The Configuration Management topic will be dealt with in future versions.

Complementary to this CAD manual are the PBS specific CAD Design Handbooks. Refer to chapter 5.5 PBS CAD Design Handbook for more information.

The handbooks can be found here: [CAD Design Handbooks \(3URXHL\)](#).



This manual contains hyperlinks to IDM documents that need to be launched in order to get the full picture of the topics covered.

5.3 Definitions

For a complete list of ITER abbreviations see:



[ITER Abbreviations \(2MU6W5\)](#)

[DO Abbreviations \(24844F\)](#)


Abbreviations used in this document:


AI	= As Installed
AM	= Alternative Model
CAD	= Computer Aided Design
CD	= Conceptual Design
CM	= Configuration Model
CV5	= CATIA V5
DA	= Domestic Agency
DD	= Detail Design
DIN	= Design Integration
DM	= Detail Model
DMU	= Digital Mock Up
DO	= Design Office
DWO	= Design Work Order
EP	= External Partner
EV5	= ENOVIA V5
FB	= File-Based
GV	= General Visibility


IDM	=	ITER Document Management system
IO	=	ITER Organization
LCA	=	Life Cycle Application (ENOVIA LCA)
LV	=	Limited Visibility
P&O	=	People and Organization
PBS	=	Plant Breakdown Structure
PBSA	=	Plant Breakdown Structure Architect
PP	=	Procurement Package
PRC	=	Product Root Class
RE	=	Responsible Engineer
SE	=	Structure Exposed
SMDD	=	System for the Management of Diagrams and Drawings
VPM	=	Virtual Product Management (ENOVIA VPM)
WP	=	Work Package

5.4 Quick Reference Guide to rules

The following table provides an overview of the rules contained in this section of the CAD Manual.

Categories: M = Mandatory (Shall comply) R = Recommended (Should comply)						
Topic	Rule No. 	Rule Description	Category	Q-Checker Rule	EV5/FB	CAD Manual Section
General	<u>RE01</u>	ENOVIA is the official CAD database for the ITER project. All parts, assemblies and drawings designed with CATIA shall be stored under ENOVIA.	M		EV5	5.7
	<u>RE02</u>	Fill in all relevant properties/attributes.	M	IO_PRO_2	EV5/FB	5.6
	<u>RE03</u>	In CATIA use only the ITER properties panel to fill-in the properties/attributes.	M		EV5/FB	5.6
	<u>RE04</u>	ENOVIA description instance attribute shall be filled-in as a minimum with the PBS values.	M		EV5	5.8.2
	<u>RE05</u>	Consult the complementary <u>CAD Design Handbooks</u> (3URXHL) for PBS specificities.	M		EV5/FB	5.5
Data Structuring	<u>RE06</u>	The tree structure of the PRC shall contain CAD data according to the purpose of the PRC.	M		EV5	5.6.1
	<u>RE07</u>	Only CATIA/ENOVIA support is allowed to create new PRC.	M		EV5	5.6.1
	<u>RE08</u>	1 st Level of SE under the PRC is structured by PBS. For each PBS we define max 5 SE for CONFIG. CONTEXT, DM and AM.	M		EV5	5.6.2
	<u>RE09</u>	The selective load capability of SE assemblies in ENOVIA leads to SE assemblies in the higher levels of the product structure and Work Packages or part detail at the leaf level.	M		EV5	5.6.2
	<u>RE10</u>	Specific data like skeleton shall be located under dedicated nodes.	M		EV5	5.6.2
	<u>RE11</u>	Respect the characteristics of SE and WP to make the right choice for new assemblies.	M		EV5	5.6.3
	<u>RE12</u>	Several ENOVIA instances of the same ENOVIA part reference are used for mechanical design systems to accelerate change management.	M		EV5	5.6.3
	<u>RE13</u>	The requirement of unique identification of plant equipment and civil engineering components like plates leads to the fact that all WP up to the leaf instance are unique references.	M		EV5	5.6.3

Categories: M = Mandatory (Shall comply) R = Recommended (Should comply)						
Topic	Rule No. 	Rule Description	Category	Q-Checker Rule	EV5/FB	CAD Manual Section
Drawings	<u>RE14</u>	A single part drawing shall be linked to the CATPart. A sub-assembly drawing shall be linked to the sub-assembly CATProduct.	M		EV5/FB	5.6.4
	<u>RE15</u>	A drawing revision shall always be linked to the ENOVIA part version, which represents the CATPart or CATProduct revision linked to the views.	M		EV5	5.6.4
	<u>RE16</u>	For convenience parts/CATParts/sub-assemblies can be instantiated in a PP/PA or system PRC as leaf instance to see the drawing in the tree. Shall be handled congruent in one PBS and described in CAD handbook.	M		EV5	5.6.4
	<u>RE17</u>	<ul style="list-style-type: none"> No detail drawings in the DMU PRC. Multi PBS (except PBS22) drawings shall be in assembly drawings branch of DMU PRC. Global drawings of one PBS can be in PBS branch of the DMU PRC. 	M		EV5	5.6.4
	<u>RE18</u>	SE part shall not be used as a drawing collector because of change management.	M		EV5	5.6.4
Lifecycle & Change Management	<u>RE19</u>	The lifecycle of ENOVIA objects is defined by the combination of Maturity value, Version/Revision and Status value.	M		EV5	5.9
	<u>RE20</u>	For a SE assembly we manage part versions.	M		EV5	5.9.2
	<u>RE21</u>	For Work package and part detail (CATParts) we manage part version and document revision synchronously.	M		EV5	5.9.2
	<u>RE22</u>	No versioning mechanism is applied on ENOVIA instances.	M		EV5	5.9.2
	<u>RE23</u>	The current valid revision of linked documents shall always be synchronized with the current valid revision of the impacting CAD document(s).	M		EV5	5.9.2
	<u>RE24</u>	For part versions with associated 3D document revisions the status values of part version and document revision has to be identical.	M		EV5	5.9.3
	<u>RE25</u>	The visible contextual data (interfaces) from other PBS have a status Draft or higher.	M		EV5	5.9.3
	<u>RE26</u>	ENOVIA instances are always 'In Work'.	M		EV5	5.9.3
	<u>RE27</u>	To modify parts and documents in status draft or higher, a new version must be created.	M		EV5	5.9.3
	<u>RE28</u>	The change type shall be set to Minor or Major before promotion.	M		EV5	5.11

Categories: M = Mandatory (Shall comply) R = Recommended (Should comply)						
Topic	Rule No. 	Rule Description	Category	Q-Checker Rule	EV5/FB	CAD Manual Section
Visibility	<u>RE29</u>	Leaf instances, their content and documents at status 'In Work' or 'Void' are invisible to users of other organizations.	M		EV5	5.10.1
	<u>RE30</u>	To allow designers of the same PBS, access to the 'In Work' data and other PBS designers to GV data, 2 leaf instances of the same reference but different versions can be managed in the same branch or sub branch of the tree structure. This approach: i. Is not allowed for CONTEXT and CONFIG branches. ii. Is allowed in DM and AM branch but is not mandatory. iii. Shall be described in CAD handbook of the system.	M		EV5	5.10.2
	<u>RE31</u>	The visibility and access to sensitive CAD data classified as "ITER RESTRICTED" is managed in addition to the visibility management.	M		EV5	5.10.3
	<u>RE32</u>	All drawings classified as 'ITER RESTRICTED' shall be clearly marked as such on each drawing sheet.	M		EV5	5.10.3
Variant / Alternative	<u>RE33</u>	Variants of mechanical design parts shall be preferably managed with skeleton methodology.	R		EV5	5.12
	<u>RE34</u>	An Alternative is only used for defining a new concept of design, which can evolve in parallel to the original design.	M		EV5	5.13
	<u>RE35</u>	Alternatives are new independent references.	M		EV5	5.13
	<u>RE36</u>	Alternatives shall have the representation attribute value AM or AMDRW.	M		EV5	5.13
	<u>RE37</u>	Alternatives shall be in a separated AM branch of the tree structure, not mixed with DM or CM.	M		EV5	5.13
	<u>RE38</u>	If an alternative for at least one part inside a work package is needed, we make an alternative for all work packages up to the leaf instance.	M		EV5	5.13
	<u>RE39</u>	Alternatives are identified with the Option attribute. The value shall be speaking like the DWO number.	M		EV5	5.13
	<u>RE40</u>	Only one part among reference and alternatives can have the preferred attribute value Y (YES), all others must have N (NO).	M		EV5	5.13
	<u>RE41</u>	If the decision is taken to replace the current "reference" design by the alternative, the former alternative shall replace the "reference" in the specific branch.	M		EV5	5.13


Categories: M = Mandatory (Shall comply) R = Recommended (Should comply)						
Topic	Rule No. 	Rule Description	Category	Q-Checker Rule	EV5/FB	CAD Manual Section
P&O	<u>RE42</u>	The structure of the data is organized in PBS-Levels. This corresponds to the organizations of the P&O.	M		EV5	5.14.1
	<u>RE43</u>	A user with a role in a specific organization cannot change data of another organization.	M		EV5	5.14.1
	<u>RE44</u>	A user with a role in a specific project cannot change data of another project.	M		EV5	5.14.2
	<u>RE45</u>	The level of privileges (rights) within the context of organization and project are handled by different roles.	M		EV5	5.14.3
	<u>RE46</u>	The prerequisite to get a specific role with modification rights is the attendance and successful certification according to the defined procedures.	M		EV5	5.14.3
	<u>RE47</u>	Role requests shall be made following the defined procedure.	M		EV5	5.14.3
	<u>RE48</u>	The lock concept in ENOVIA is an additional security mechanism to protect data from modification.	M		EV5	5.14.4
	<u>RE49</u>	The users shall lock only the minimum of data needed to allow the modification to be performed. The data shall be unlocked as soon as possible.	M		EV5	5.14.4
	<u>RE50</u>	The visibility and access to sensitive CAD data classified as 'ITER RESTRICTED' is managed by the attribute 'RESTRICTED' and related specific organization.	M		EV5	5.14.5

Table 5.4-1 Quick reference guide to rules

5.5 PBS CAD Design Handbook

RE05 The CAD Design Handbooks contain processes and methodologies specific to a PBS. They are useful as guidance to new designers and include the information on the following:

- Global design process, design status, design goal
- Structure PRC, assembly structure, instances
- Organizations involved in the design
- Mock up overview
- Positioning
- Skeleton
- Interfaces
- ITER methodologies
- Other specific methodologies
- Drawings
- SSD Drawings

Here is the link to the IDM folder for the CAD Design Handbooks:

[CAD Design Handbooks \(3URXH\)](#)

5.6 Data structuring in ENOVIA

The structuring of the data is described from top down.

RE02 Fill in all relevant properties/attributes. See [CAD Manual 04-2 CAD Data Structuring \(34VSEC\)](#) for list of properties/attributes.

RE03 In CATIA use only the ITER properties panel to fill the properties/attributes.

Consult the complementary [CAD Design Handbooks \(3URXHL\)](#) for PBS specificities.

5.6.1 Product root class - PRC

PRC is an ENOVIA object which corresponds to root assemblies in CATIA. The PRC allows loading all subassemblies and child components in one CATIA assembly design window in the correct relative position.

PRC have a local origin. Interfaces of components between different PRC shall be handled by interface skeleton. Please refer to chapter 4.5.7 and 4.5.9.2 of [CAD Manual 04-5 Plant Design Processes \(33PE8P\)](#) for more details.

RE06 All data which is needed in context – in correct relative position – shall be instantiated in the same PRC. Copy/paste of CATIA assemblies between 2 or more assembly design windows based on PRC with different origin shall not be done to avoid mistakes for the relative position.

To avoid a too complex structure, several PRC are defined for different purpose.

- Digital mock up - DMU PRC to allow design in context and integration check. Example TOKAMAK_COMPLEX. PRC for auxiliary buildings and areas normally have a local origin.
- Procurement package PRC to simplify collaboration and to locate detailed or manufacturing design data. Example FEEDER_SYSTEM_PA_11_P5A_CN.
- Process PRC contains tools, equipment and instances of components for assembly, maintenance and other processes.
- System PRC allow to collect data of the complete system from different PRC, to be able to load the complete system in correct relative position. No contextual data shall be instantiated in these PRC.
- Alternatives with large impact on several systems shall be stored in dedicated study PRC.
- Dedicated PRC can be defined for Baseline of approved CM data.
- PRC can also be created for other purpose like catalogue management etc.
-

RE07 Only the CATIA/ENOVIA support team are allowed to create a new PRC.

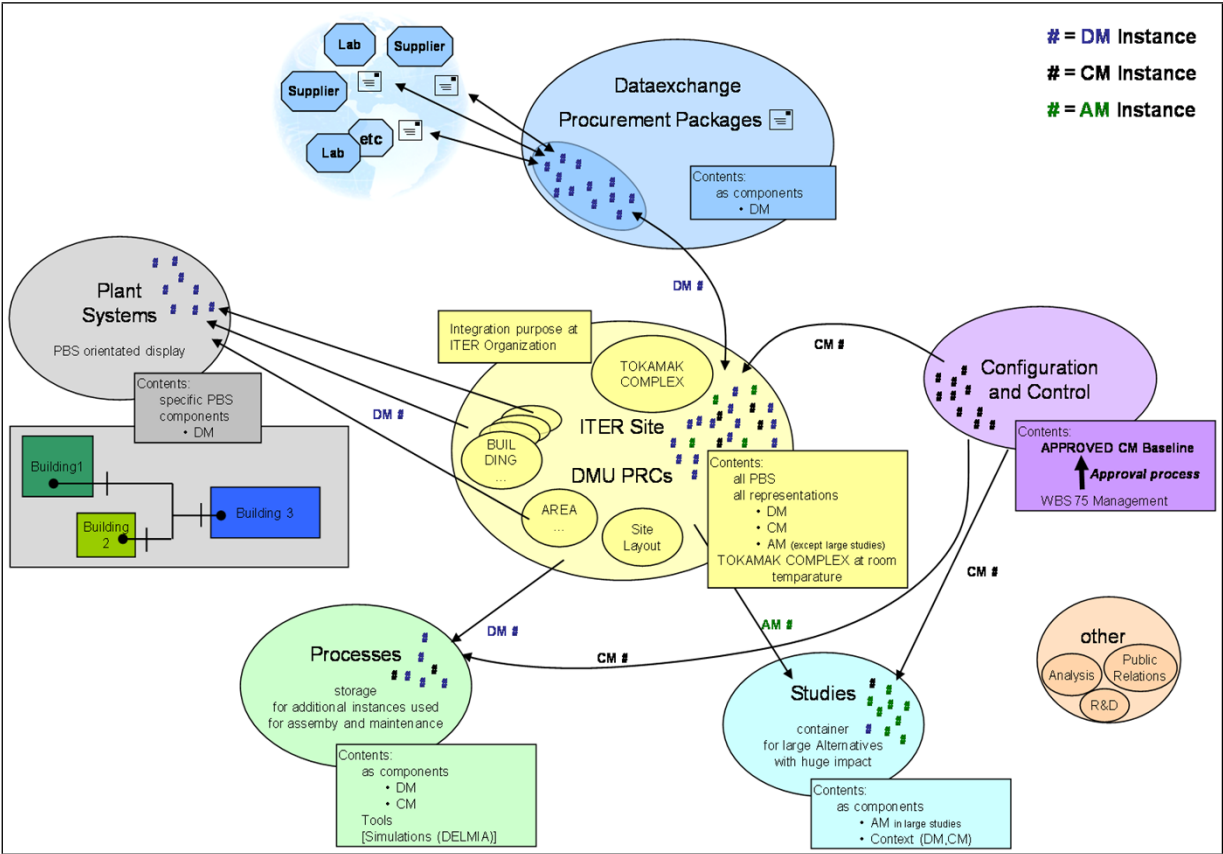


Figure 5.6-1 PRC classification and usage

5.6.2 Product structure

RE08 In the DMU PRC for one system/PBS typically we find the following structure exposed assemblies in the first level under the PRC. See Figure 5.6-2 below.

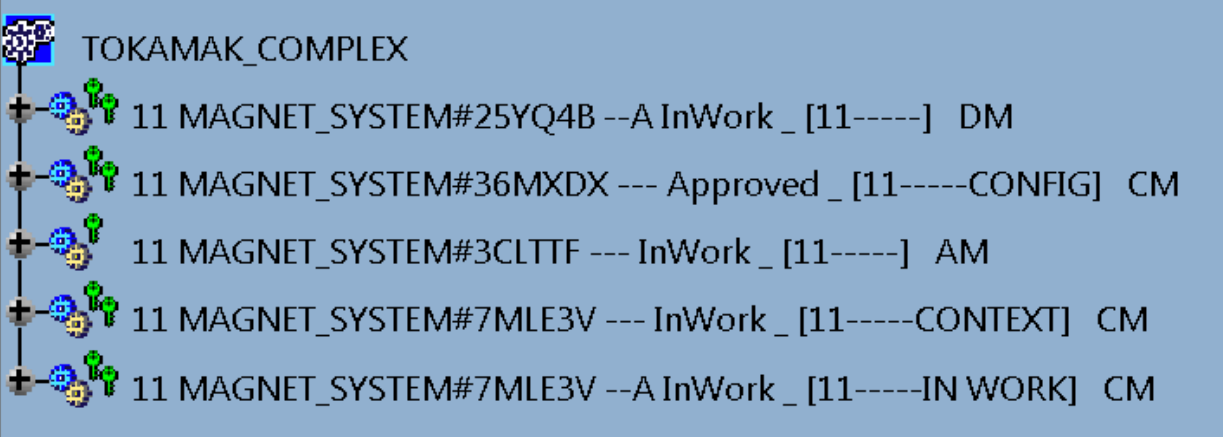


Figure 5.6-2 1st Level of product structure - mechanical system

One reference exists for the configuration model with representation CM containing the current approved baseline marked as CONFIG.

Definition of CONFIG branches according to [Procedure for Management of Contextual CAD Data \(EGPR3D\)](#) : "An assembly of CAD models located directly below a PRC and containing the CMs as part of the latest approved technical baseline (In Check and/or Approved model versions.... These models define the reference 3D environment."

One reference exists for the configuration model with representation CM containing the current working CONTEXT, this represents the status of ongoing controlled design work which is based on changes under Study or Pre-Implementation phase. These models are provided to improve the visibility of on-going design studies which may later result in “approved” changes to the technical reference baseline and 3D environment.

The same reference can be found with higher version index for the configuration model with representation CM to prepare the next working CONTEXT.

One reference for the detailed model with representation DM.

One reference for the Alternative model with representation AM, if any alternative exists.

For plant systems CM and DM can be unified. In such cases the 1st Level looks like that shown in Figure 5.6-3 below.



Figure 5.6-3 1st Level of product structure unified CM/DM

One reference exists for the configuration model with representation CM containing the current approved baseline marked as CONFIG.

One reference exists for the configuration model with representation CM containing the current working CONTEXT.

The same reference can be found with higher version index for the configuration model with representation CM to prepare the next working CONTEXT - REVIEW. This branch is optional.

The same reference with higher version index representation CM contains ‘In Work’ models. In this branch current design work is performed.

One reference for the Alternative Model with representation AM, if any alternative exists.

CM branch shall only contain data with CM representation, DM only DM and AM only AM.

RE09 The selective load capability of structure exposed assemblies in ENOVIA leads to structure exposed assemblies in the higher levels of the product structure and Work Packages or part detail at the leaf level. See Figure 5.6-4.

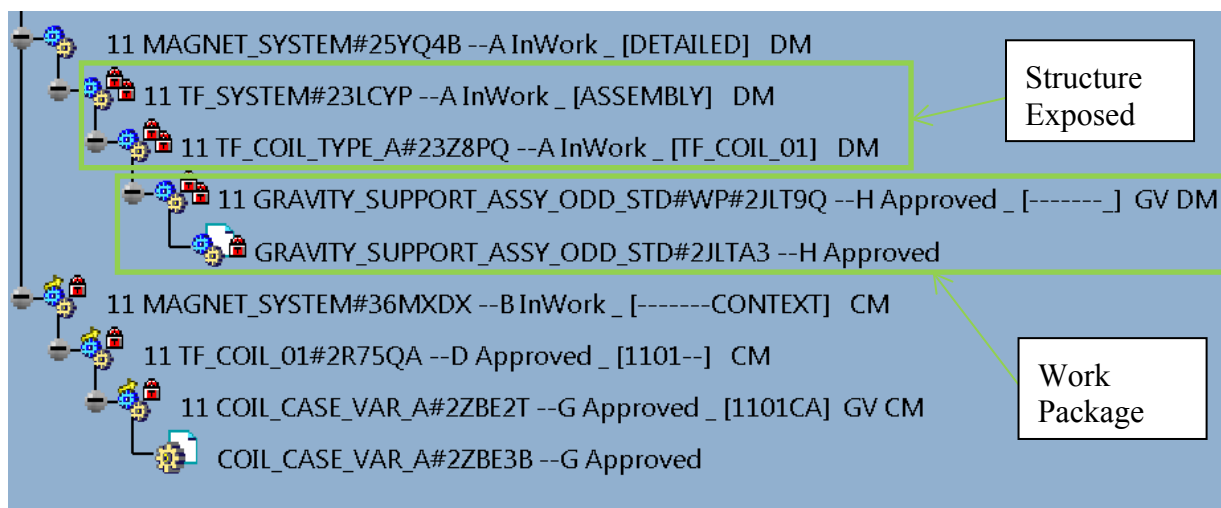


Figure 5.6-4 Position of ENOVIA assembly types in the tree

RE10 Specific data like Skeleton which shall not occur in the DMU branches described above shall be located under dedicated nodes. See Figure 5.6-5.

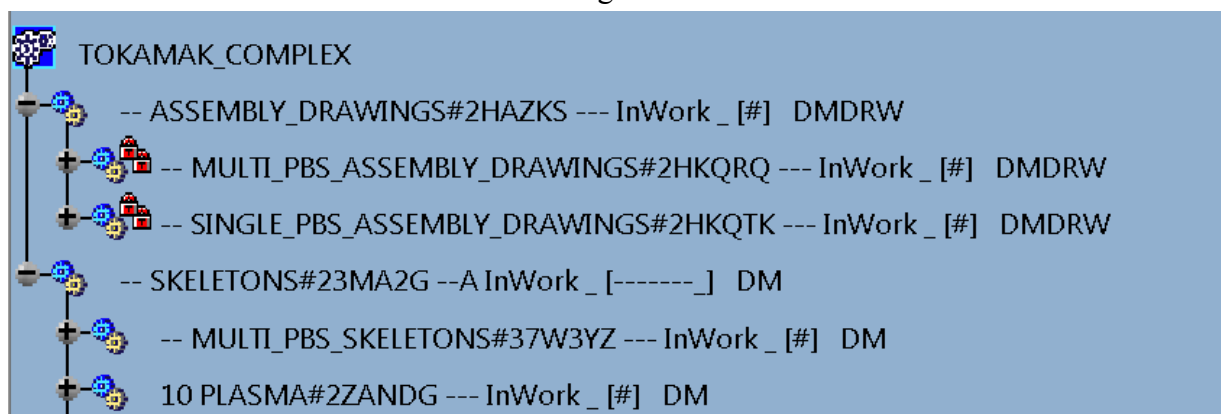


Figure 5.6-5 Position of specific data like Skeletons in the ENOVIA tree

5.6.3 *Structure exposed assemblies vs. publication exposed*

RE11 The structure exposed (SE) and Work Package (WP)/publication exposed assembly types have certain characteristics. Before the creation of a new assembly these characteristics have to be respected, as it is not possible to change the assembly type later.

Both types are used. From top down we start with several levels of structure exposed assemblies. See also Figure 5.6-6. The number of levels depends on PBS structure and CAD modelling needs. The leaf instance is normally a WP, which can contain other WP as sub-assemblies.

Exposed assembly = Structure Exposed = ENOVIA part of type assembly controlled by ENOVIA	Work package (WP) = publication exposed = ENOVIA part of type assembly controlled by CATIA
No CATProduct file/document saved in ENOVIA	CATProduct file/document saved in ENOVIA
Possible Content: Links to EV5 parts detail (CATPart) Links to exploded assembly Links to WP Links to assembly constraints	Possible content: Links to EV5 parts detail (CATPart) Links to WP Links to assembly constraints Application data like scene, section, clash, kinematics etc.
Impossible content: Application data	Impossible content: Structure exposed assembly

Table 5.6-1 Characteristics of SE and WP modes

The assembly type cannot be changed. Therefore existing assemblies will keep the assembly type from creation. For new assemblies the following table intends to give some hints to decide, which type should be used. A sub-assembly inside a WP has to be always also WP.

Criteria	Structure Exposed assembly	Small WP (low position in the tree)	Large WP (high position in the tree)	Comment/rationale
Concurrent engineering	Good	Not relevant if only one designer is working with the data inside the WP	Difficult	Only one designer can work in the context of one WP, several designer can work on the parts or sub-assemblies inside
Zoning and Volume filter/selective load	Good	Volume filter ok if the geometrical size is small enough / selective load inside the WP impossible	Bad	The whole WP (leaf instance only) is found and loaded
Application data (scene, fitting etc.)	Impossible	Possible	Possible	
Assembly drawings	Forbidden	Ok	Ok	
Several procurement package (PP) inside one assembly	Ok	Impossible	Impossible	One PP is the smallest unit for a Work Package, in one WP we cannot handle several PP
Reliability	Ok	Better	Better	Inside a Work Package links, constraints etc. are handled by CATIA
Number of instances and complexity of the product tree	10 million parts may be impossible	Good	Better	Parts and sub-assemblies inside a WP are not instances in ENOVIA
Depth of structure	Maximum depth is 7	Good	No limitation	

Table 5.6-2 Characteristics of ENOVIA Assembly types

Depending on the assembly type, 2 different kinds of instance exist:

- The structure exposed assemblies and their children are ENOVIA instances.
- Inside a WP we have CATIA instances.

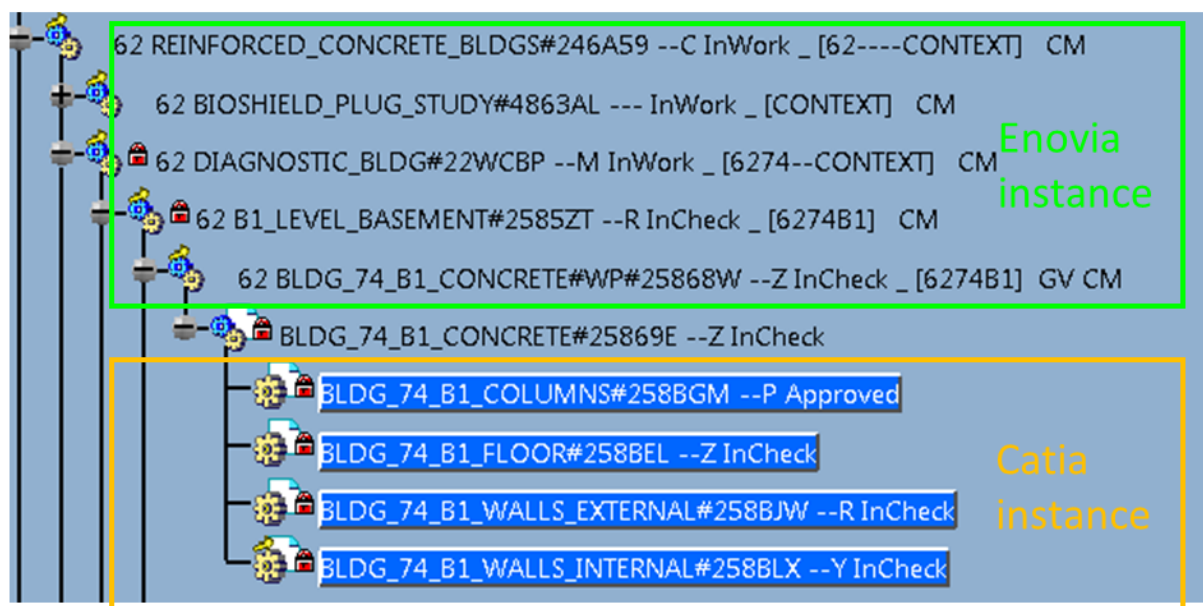


Figure 5.6-6 ENOVIA and CATIA instances in the tree structure

	ENOVIA instance	CATIA instance
Attributes/metadata	Exposed in ENOVIA	Information stored in the WP
Uniqueness	Yes	No (only if all WP up to the leaf instance are unique reference)
Lifecycle	Separate	Embedded in the WP
Frozen status	No	Same as the WP
Lock	Yes	Embedded in the WP

Table 5.6-3 Comparison of ENOVIA and CATIA instances

RE12 Several ENOVIA instances of the same ENOVIA part reference are used for mechanical design systems like MAGNET SYSTEM to accelerate change management if the same set of CAD models is used in different locations or to allow the usage of the same set of CAD models in several PRC.

RE13 The requirement of unique identification of plant equipment and civil engineering components like plates leads to the fact that all WP up to the leaf instance are unique references. Otherwise the description instance of the CATIA instances inside the WP cannot be used for unique functional reference.

5.6.4 Drawings

- i. **RE14** A single part drawing shall be linked to the CATPart. A sub-assembly drawing shall be linked to the sub-assembly CATProduct.
- ii. **RE15** A drawing revision shall always be linked to the ENOVIA part version, which represents the CATPart or CATProduct revision linked to the views.
- iii. If this part version is visible in the tree structure because it represents a leaf instance, the drawing also will be visible in the tree.
- iv. If the part version is not visible in the tree because the related CATPart/CATProduct is only used inside a WP, the drawing will not be visible in the tree structure but can be found by impacts on function etc...
- v. **RE16** For convenience parts/CATParts / Sub-assemblies can be instantiated in PP/PA or system PRC as leaf instances to see the drawing in the tree. Detailed manufacturing drawings might be managed in SMDD application. Shall be handled congruent in one PBS and described in CAD handbook.
- vi. **RE17** No detail drawings in the DMU PRC. Multi PBS (except PBS22) drawings shall be in the assembly drawings branch of the DMU PRC. Global drawings of one PBS can be in PBS branch of the DMU PRC.
- vii. **RE18** SE part shall not be used as a drawing collector (many drawings linked to the same SE part) because of change management.

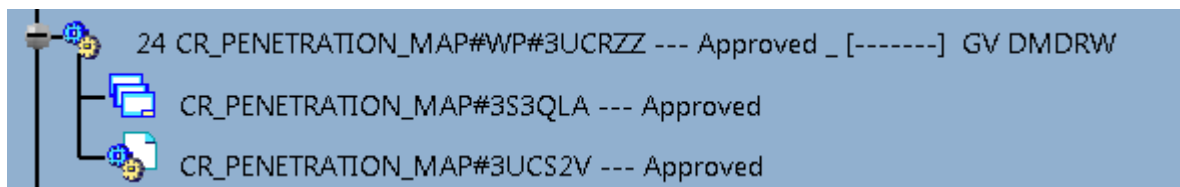


Figure 5.6-7 Drawing linked to leaf instance

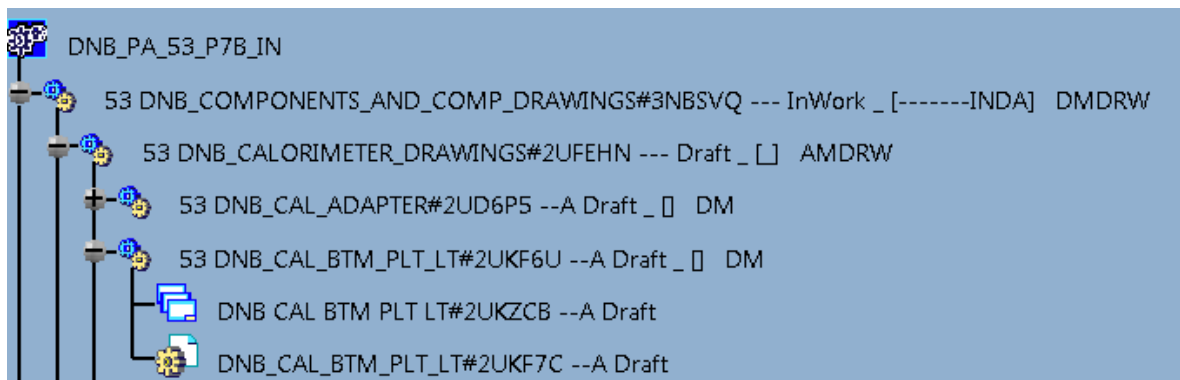


Figure 5.6-8 Access to drawings via the tree in PA/PP PRC

5.7 New Data Creation

RE01 ENOVIA is the **official CAD database for the ITER project** and consequently, all parts, assemblies and drawings designed with CATIA **shall be stored under ENOVIA.**


5.8 Attributes

Attributes or properties are used to identify and manage the data, for search or filtering of parts in the ENOVIA V5 database, for lifecycle, configuration & change management and to fill-in the title block of drawings.

A detailed description of the attributes can be found in [CAD Manual 04-2 CAD Data Structuring \(34VSEC\)](#).

5.8.1 Tool

Attributes of parts, assemblies, instances and documents stored under ENOVIA must be filled-in or modified with:

- i. "Modify ITER properties"  function or
- ii. Properties function in VPMNavigator or
- iii. Sheet editor or
- iv. Edit function in LCA classic.

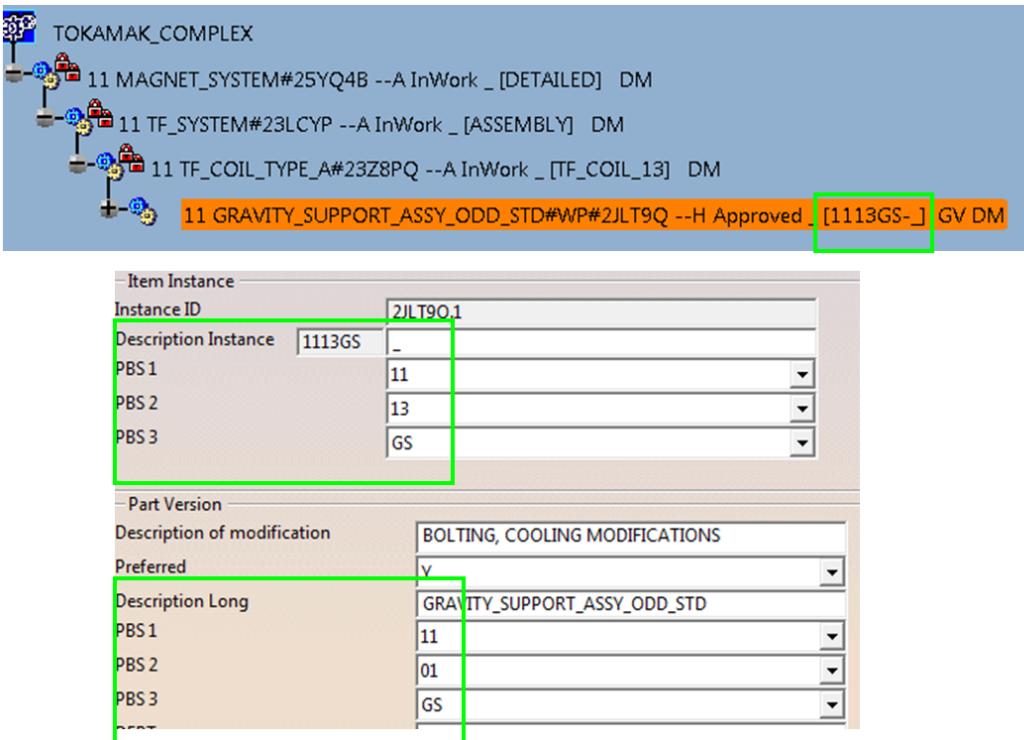
5.8.2 Instance Attributes

We differentiate between CATIA and ENOVIA instance.

ENOVIA instances are unique. The attributes on the instances are stored in ENOVIA.

CATIA instances are only unique if all WP up to the leaf instance are unique references. The attributes on CATIA instances are not stored in ENOVIA.

RE04 The description instance attribute for ENOVIA instances is used for marking like CONTEXT and to show the correct PBS values, this is not possible on the part version PBS if the same part reference is used in a different position - instance.



The image shows a screenshot of the ENOVIA instance tree and a corresponding attribute form. The tree on the left lists several instances under 'TOKAMAK_COMPLEX', with the last one, '11 GRAVITY_SUPPORT_ASSY_ODD_STD#WP#2JLT9Q --H Approved', highlighted in orange. To the right of this instance, the value '[1113GS-]' is shown in a green box, followed by 'GV DM'. Below the tree is a form with two sections: 'Item Instance' and 'Part Version'. The 'Item Instance' section contains fields for 'Instance ID' (2JLT9Q.1), 'Description Instance' (1113GS), and three 'PBS' fields (PBS 1: 11, PBS 2: 13, PBS 3: GS), all of which are enclosed in a green box. The 'Part Version' section contains fields for 'Description of modification' (BOLTING, COOLING MODIFICATIONS), 'Preferred' (Y), 'Description Long' (GRAVITY_SUPPORT_ASSY_ODD_STD), and three 'PBS' fields (PBS 1: 11, PBS 2: 01, PBS 3: GS), also enclosed in a green box.

Item Instance	
Instance ID	2JLT9Q.1
Description Instance	1113GS
PBS 1	11
PBS 2	13
PBS 3	GS

Part Version	
Description of modification	BOLTING, COOLING MODIFICATIONS
Preferred	Y
Description Long	GRAVITY_SUPPORT_ASSY_ODD_STD
PBS 1	11
PBS 2	01
PBS 3	GS

Figure 5.8-1 Instance PBS and Part version PBS

5.9 Lifecycle

RE19 The lifecycle of ENOVIA objects is defined by the combination of Maturity value, Version/Revision and Status value.

That means for the maturity level 'CD', a part version --A is at 'Approved' status. In parallel for the maturity level 'DD', a part version --B 'In Work' status can exist.

The change management process is based on the lifecycle definition, promotion and version/revision mechanism.

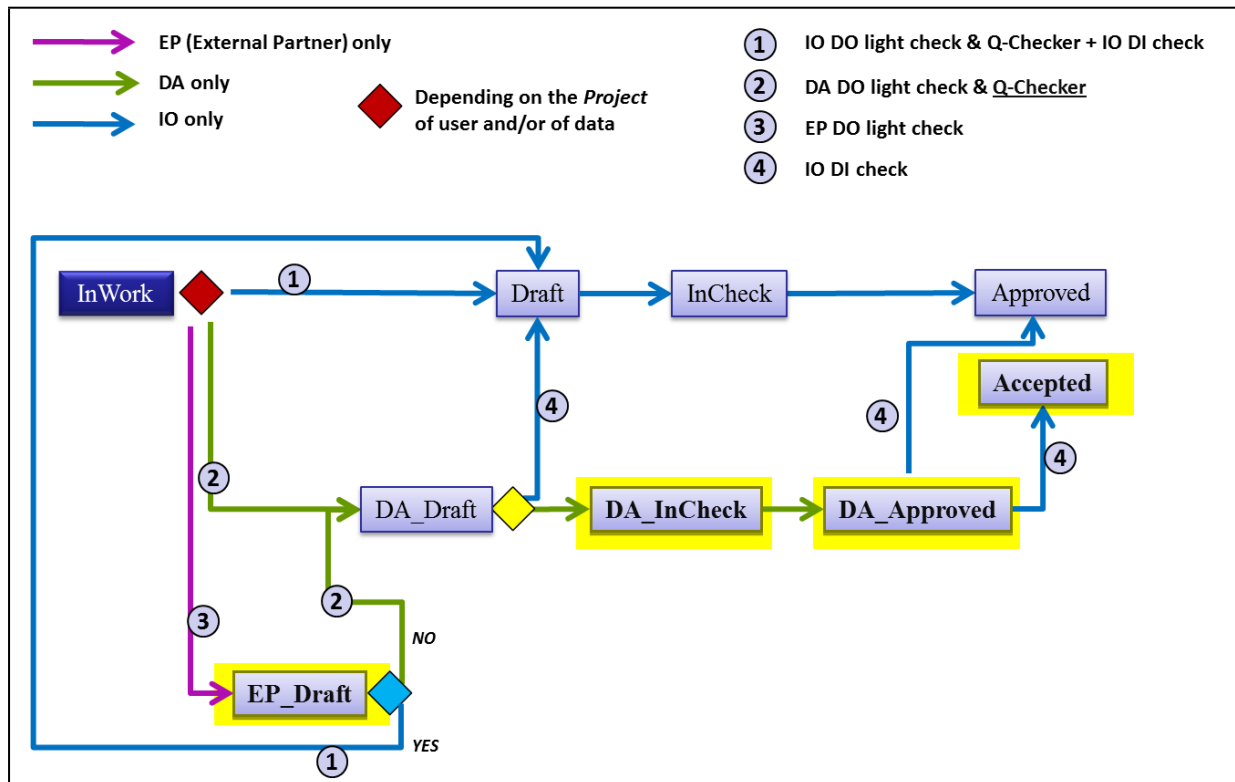


Figure 5.9-1 Simplified CAD data life-cycle

For more details concerning the promotion procedure please refer to [Procedure for the Promotion of CAD data \(64F2QY\)](#).

5.9.1 Maturity of Part

The part maturity varies from CD 'Concept Design' to AI 'As Installed' and describes the lifecycle of the whole project. Maturity values will be defined in detail by the project.

5.9.2 *Version and revision*

Part versions are used to manage the history of changes of ENOVIA parts.

Document revisions are used to manage the history of changes of ENOVIA documents.

The version/revision capability allows us to:

- i. Keep a history of the design evolution.
- ii. Have access to the design at a previous stage.
- iii. Step back and restart from a former solution.

The indexing sequence is "---",--A, --B, --C, etc.

RE20 For a SE assembly we manage part versions. No document exists.

RE21 For a Work package and part detail (CATParts) we manage part version and document revision synchronously.

For drawing documents we only manage revisions.

RE22 No versioning mechanism is applied on ENOVIA instances.

RE23 The current valid revision of linked documents of the following shall always be synchronized with the current valid revision of the impacting CAD document(s):

- i. Parts driven by a skeleton.
- ii. Drawings related to 3D parts and assemblies.
- iii. Assemblies (WP) containing children.

5.9.3 *Status of Parts and Documents*

The status attribute defines the current lifecycle phase of the document revision or part version.

RE24 For part versions with associated 3D document revisions the status values of part version and document revision have to be identical.

Status	Abbreviation (Title block)	Description	Data can be changed
In Work	W or INW	Object in modification.	Yes
EP Draft	EPD	Cursory check performed without DI approval (after EP QA light check).	No
DA Draft	DAD	Cursory check performed without DI approval (after DA QA light check).	No
Draft	D or DRA	Light check performed.	No
In Check	C or INC	Full check is taking place.	No
DA In Check	DAC	Full checking process is taking place at the DA.	
DA Approved	DAA	Full checking completed and docs approved at the DA.	
Accepted	ACC	DA data accepted by IO.	No
Approved	A or APP	Full check completed.	No
Void	V or VOI	A designer rejects his own work because the design does not fulfil the requirements any more or is no longer valid. The development of an alternative design has stopped.	No
Rejected	R or REJ	In the approval process the object is rejected because it does not fulfil the requirements and is not valid any more.	No
Invalid	I or INV	Approved data not valid any more, development has stopped.	No
Obsolete	O or OBS	Status for previous version/revision if new version/revision exists.	No

Table 5.9-1 IO lifecycle Status values

5.9.3.1 In Work status

- i. Design work is performed by the Designer under the DWO process & RE monitoring.
- ii. The Designer can only develop / modify the CAD data subject to the DWO. Part changes / creation performed outside the scope of the DWO have to be organized by the relevant interface RO.
- iii. The 'In Work' CAD data is only visible to the Designers & RE/RO working for the given PBS and the "all-PBS Readers" (IO DIN, IO DO Management).
- iv. **RE25** The visible contextual data (interfaces) from other PBS have a status Draft or higher.

RE26 ENOVIA instances are always 'In Work'.

The action to change the status is called "promotion".

RE27 To modify parts and documents in status draft or higher, a new version must be created. For current status value definition and lifecycle please refer to [IO Lifecycle CV5 EV5 Custo Spec Task 005 \(25MATQ\)](#).

5.10 Visibility management

5.10.1 Introduction

RE29 Leaf instances, their contents and documents of own organization (PBS) which are at ‘In Work’ or ‘Void’ status are hidden and protected from access by users of other organizations to enable only the access to checked data, which have reached a level of maturity to allow concurrent engineering in an efficient way.

The visibility management is implemented based on the status of the part and the visibility attribute.

5.10.2 Principle of visibility

For a SE assembly, the visibility attribute automatically has the value ‘GV’ (General Visibility).

SE assemblies with any status including ‘In Work’ are visible to all.

A leaf instance is not visible if:

- A) It does not belong to your **PBS organization**

AND

- B) It is in the ‘**In Work**’ or ‘**Void**’ status

For all other cases, it is visible.

To handle the visibility, the attribute ‘Instance visibility’ with the values GV (General Visibility) and LV (Limited Visibility) are defined.

RE30 To allow designers of the same PBS access to the ‘In Work’ data and other PBS designers to GV data, 2 leaf instances of the same reference but different versions can be managed in the same branch or sub branch of the tree structure. See Figure 5.10-1.

This approach is:

- i. Not allowed for CONTEXT and CONFIG branches
- ii. Allowed in DM and AM branch but not mandatory
- iii. Shall be described in CAD handbook of the system

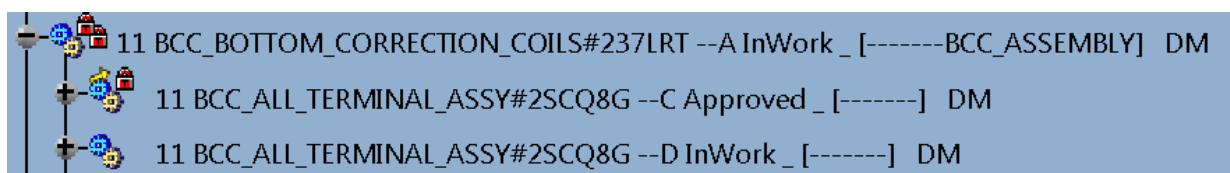


Figure 5.10-1 LV and GV leaf instance

5.10.3 ITER Restricted data

RE31 The visibility and access to sensitive CAD data classified as “ITER RESTRICTED” is managed in addition to the visibility management described above.

Data can be restricted because of export control regulation, IP protection of intellectual properties or security classification.

RE32 All Drawings classified as ‘ITER RESTRICTED’ shall be clearly marked as such on each drawing sheet.

5.11 Change management (Minor & Major change)

There are two types of change - minor change and major change.

A new version is created in case of:

- A. **Minor change** (no interface change AND no conceptual change):
- i. We increment the ENOVIA part version.
 - ii. AND the 3D document revision.
 - iii. AND set the Change type attribute to minor. See Figure 5.11-1.

Example of application:

- i. Chamfer added to the internal CATPart of a given Product.
- ii. Internal dimensional change.
- iii. Change of material (if no impact on interfaces).
- iv. Adding a geometrical tolerance...

- B. **Major change** (either interface change on adjacent system(s). AND/OR conceptual change:

- i. We increment the ENOVIA part version.
- ii. AND the 3D document revision.
- iii. AND set the Change type attribute to major. See Figure 5.11-1.

Example of application:

- i. Change of the position of the pipe connection of a component to an external cooling circuit.
- ii. Change of the gripping shape between a component and the robot in charge of its remote handling.

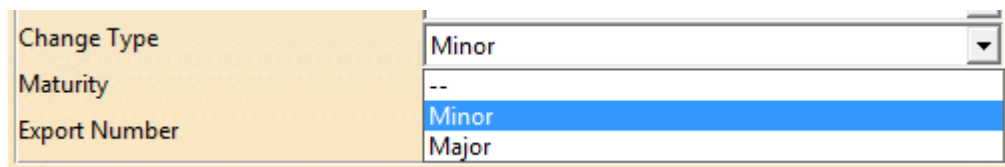


Figure 5.11-1 Change type attribute

RE28 The change type shall be set to “Minor” or “Major” before promotion.

2D document change - graphical change

In this case the geometry of the part is not affected. Example:

- i. Modification of a tolerance on a drawing

We increment the document revision of the CATDrawing only.

According to this definition an interface skeleton can only have major changes.

Inside a WP we cannot differentiate between minor and major change and the status.

The consequence is:

A WP and its contents are handled like one component. If a major or minor change for one part inside a WP occurs, all WP above up to the leaf instance will also be affected and the version incremented.

If one part inside the WP experiences a major change, the change type of the WP is also major.

5.12 Variant

A variant is an independent reference of a SE assembly, work package or single part with similar geometry in a different position.

Assembly variants can contain identical parts. Any changes to the identical parts will occur in any variant.

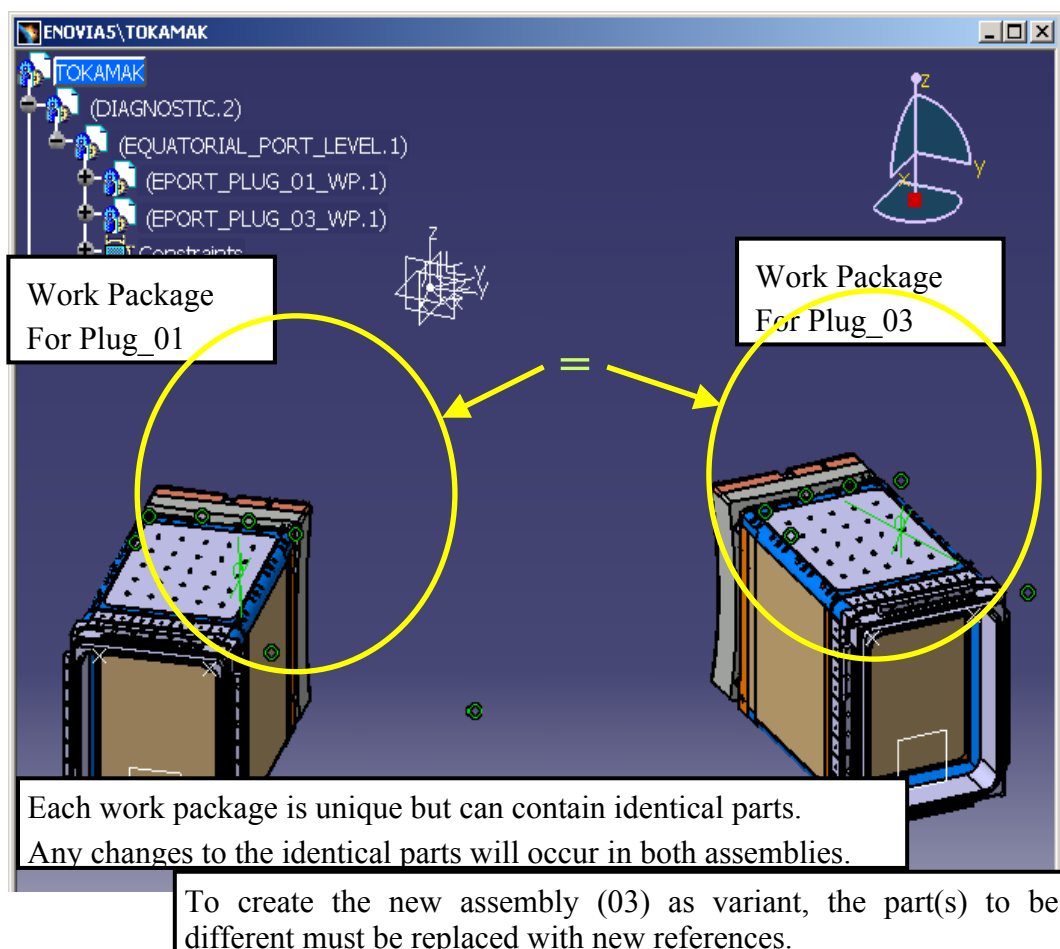


Figure 5.12-1 Example of application of variant

RE33 Variants of mechanical design parts should preferably be managed with skeleton methodology.

More details you can find in [CAD Manual 04-3 Mechanical Design Methodologies \(33XVW6\)](#).

5.13 Alternative

RE34 An alternative is used to define another technical solution designed in addition to the original solution. The alternative is only used for defining a new concept of design, which can evolve in parallel to the original design.

- i. **RE35** Alternatives are new independent references.
- ii. **RE36** Alternatives shall have the representation attribute value AM or AMDRW.
- iii. **RE37** Alternatives shall be in a separated AM branch of the tree structure, not mixed with DM or CM.
- iv. **RE38** If an alternative for at least one part inside a work package is needed we make an alternative for all work packages up to the leaf instance.
- v. **RE39** Alternatives are identified with the Option attribute. The value shall be speaking like the DWO number.
- vi. **RE40** Only one part among reference and alternatives can have the preferred attribute value Y (YES), all others must have N (NO).
- vii. **RE41** If the decision is taken to replace the current “reference” design by the alternative, the representation of the alternative shall change to DM etc., option is removed and preferred is set to YES. The former alternative shall replace the “reference” in the specific branch. The former “reference” shall be promoted to Void or Invalid.
- viii. If the decision is taken to abandon the alternative study, the data shall be promoted to void.

5.14 P & O management

People and organization is a functionality implemented under ENOVIA/LCA to enable and manage organization, users and their privileges (rights) to the data.

5.14.1 Organization

RE42 The structure of the data is organized in PBS-Levels. This corresponds to the organizations of the P&O.

RE43 A user with a role in a specific organization cannot change data of another organization.

When a user logs into ENOVIA they must have a context. A context consists of 3 elements:

`<rolename>.<organisationname>.<projectname>`.

For example a user who has to work on BUILDINGS staff has a context like DESB.BUILDINGS.ITERPRJ

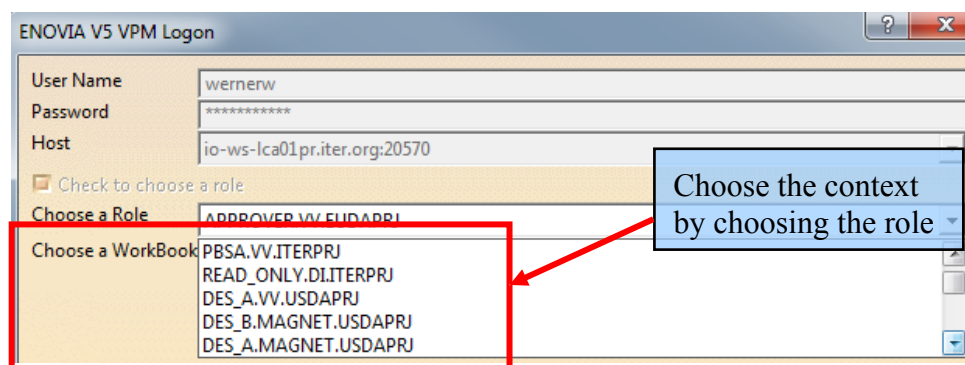


Figure 5.14-1 ENOVIA login window

5.14.2 *Project definition*

There is one Project for International Organisation: ITERPRJ

For Domestic Agency (DA) and supplier additional projects in P&O are defined.

EXTERNAL = for the external user (Web user)

EUDAPRJ, USDAPRJ ... = project definition for DA and supplier.

RE44 A user with a role in a specific project cannot change the data of another project.

5.14.3 *Role definition*

RE45 The level of privileges (rights) within the context of organization and project are handled by different roles.

Table 5.14-1 shows the list of roles available in ENOVIA. Additional roles will be added as and when needed by the project.

Role name	User	Role usage
LCAMAN	LCA Administrator	Administration of LCA with P&O and read + write access of all data
PBSA	PBS Architect	Management of tree structure, promotion and lock/unlock
DESA	Designer Advanced	For the advanced designer in a PBS
DESB	Designer Basic	For the normal designer in a PBS
ENG	Engineer	For the RE/RO - read access only
READ_ONLY_DI	DIN	For read access to all data except restricted
READ_ONLY_EXTERNAL	READ Only	For read access to GV data

Table 5.14-1 Roles in the P&O

Privileges	DESB in own org. (PBS)	DESA in own org. (PBS)	PBSA in own org. (PBS)	DESB/DESA/ PBSA in other org. (PBS)
Read data	Yes	Yes	Yes	GV data
Unlock Part Reference/Part Instance/Document	Own data	Own data	Yes	No
Lock unlocked Part Reference/Part Instance/Document	Yes	Yes	Yes	No
Create a SE,WP, part	Yes	Yes	Yes	No
Modify position of ENOVIA instance (no constraint)	Yes	Yes	Yes	No
Delete or modify assembly constraint for ENOVIA instance	No	No	Yes	No
Delete a SE Instance	No	No	Yes	No
Any modification inside WP	Yes	Yes	Yes	No
Attach/Detach Documents	Drawing only	Drawing only	Yes	No
Create a new version	Yes	Yes	Yes	No
Transfer ownership	No	Own data	Yes	No
Promote	No	Yes (up to In Check)	Yes	No
ENOVIA LCA Access	No	No	Yes	No

Table 5.14-2 Example of user privileges

RE46 The Prerequisite to get a specific role is the user attendance and successful certification according to:

[IODO Certification Concept \(2XVM3S\)](#) and [CAD World wide support concept and procedures \(34VB64\)](#)

RE47 Role requests shall be made following the procedure [DO Procedure for the ENOVIA Roles Assignment to Users. Request and Assignment \(4EQUNW\)](#)

5.14.4 Lock and unlock

RE48 The lock concept in ENOVIA is an additional security mechanism to protect data from modification.

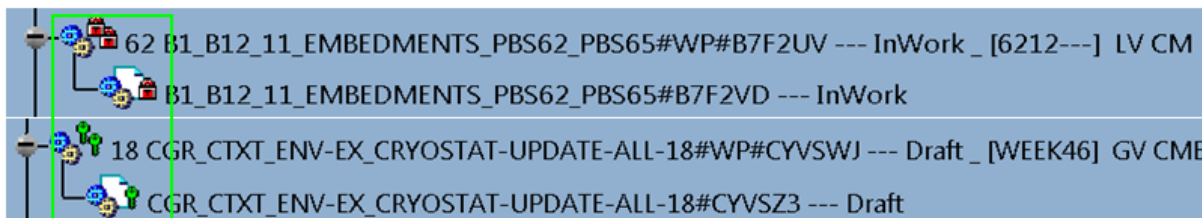


Figure 5.14-2 Locked and unlocked data

RE49 The user shall lock only the minimum of data needed to allow the modification to be performed.

The data shall be unlocked as soon as possible.

5.14.5 *Restricted data*

RE50 The visibility and access to sensitive CAD data classified as 'ITER RESTRICTED' is managed is managed by the attribute 'RESTRICTED' and related specific organization.