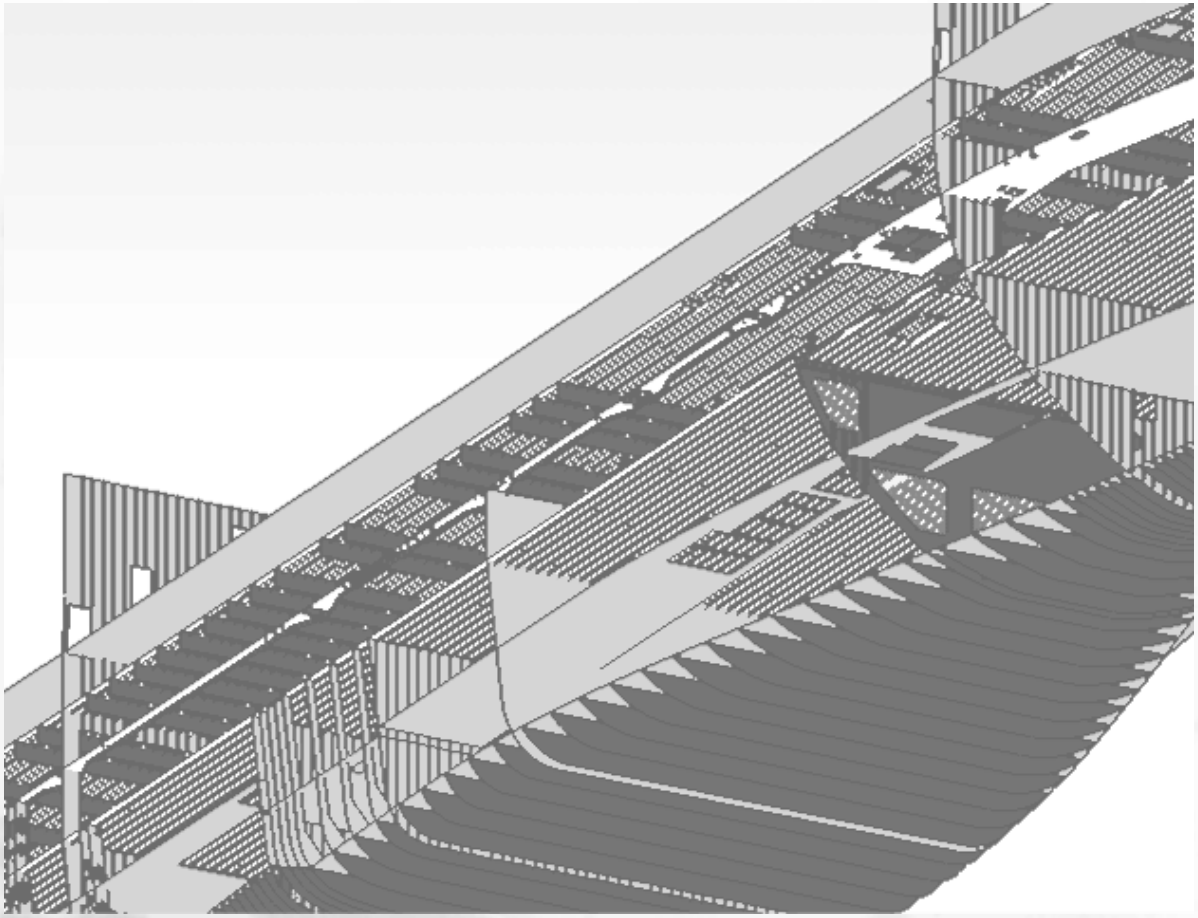
CATIA Training
Foils & Exercises



V5R16
SFD/SDD
Workshop
Setup Training

Version 5 Release 16
July 2005

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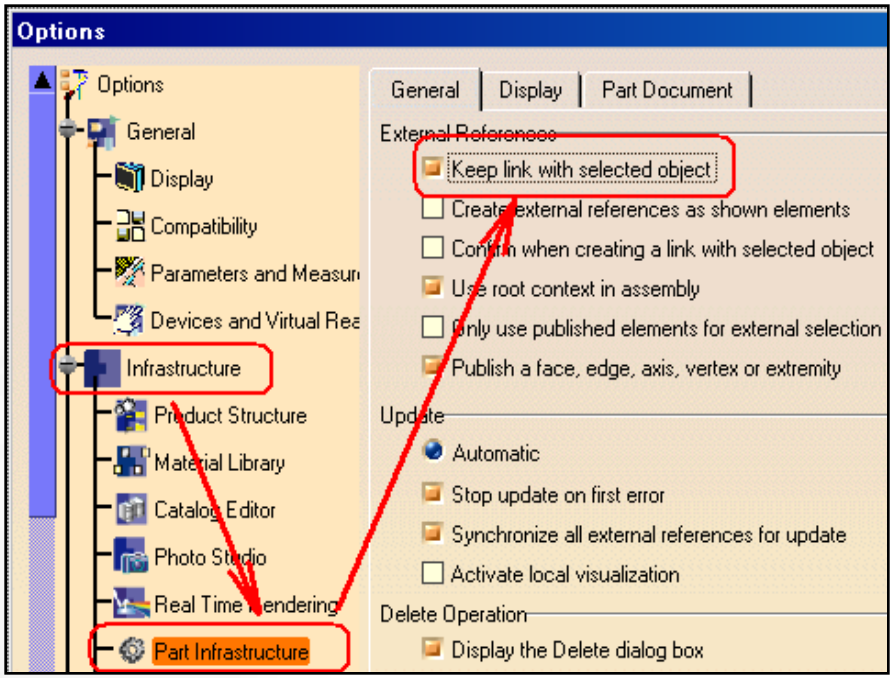
Setup (cont.)

Setting up the SFD/SDD environment

1. Select Tools + Options… (Upper Frame)
2. Switch to: Infrastructure + Part Infrastructure.
   Under the External References enable:
   Keep link with selected object
3. Switch to: Parameter and Measure + Units
   Set the units to Millimeters
4. From the Start menu select:
   Structure Functional System Design Select the proper PRM file:
   Tools → Project Management



1.1 PRM-Project Resource Management: Project Activation

PRM: Project resource management allows administrators to manage the location of resources based on projects, disciplines, and applications. The administrator will manage the XML based project file which will define the location of the resources (e.g. Catalogs, paths to resolved directories, management of the bounding box, management of Reference planes and Hull, definition of molded conventions etc..).

Steps:

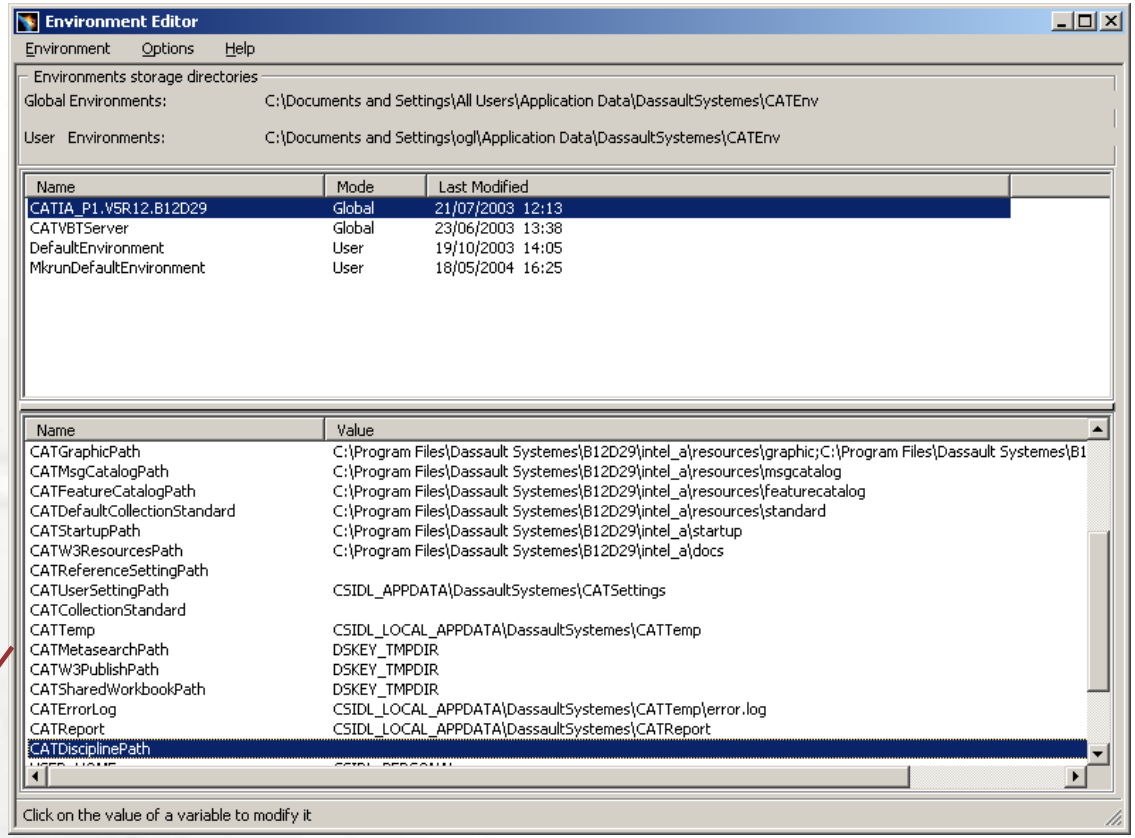
For this exercise, we will perform the following:

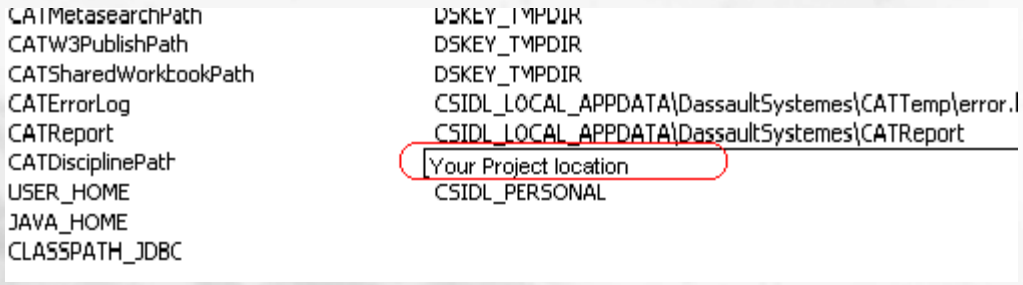
- Define a project file
- Select the project interactively
- Select the Discipline
- View the resources of the project from tools options.
- Modify the project file
- Restart Catia and ensure that the modifications are reflected

1.1 PRM-Project Resource Management: Defining a Project File

Environment Editor

- Environment variable CATDisciplinePath determines the location of the custom project files.
- Sample project file has been provided in …\…\….\….
- Default project is CNEXT.





Use current CVI path

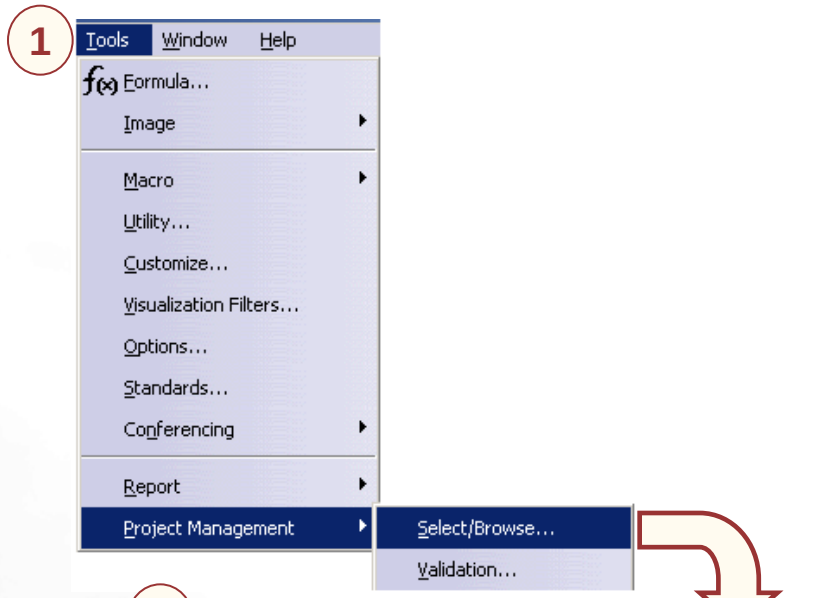
CATDisciplinePath variable

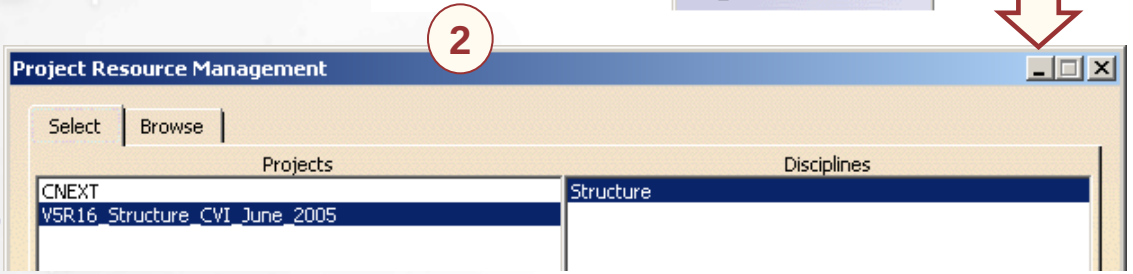
1.1 PRM-Project Resource Management: Activating a project interactively

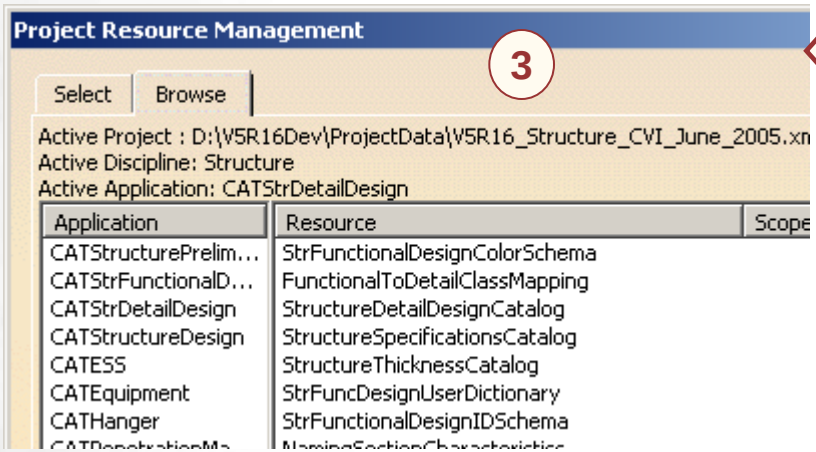
Accessing the Project files interactively.

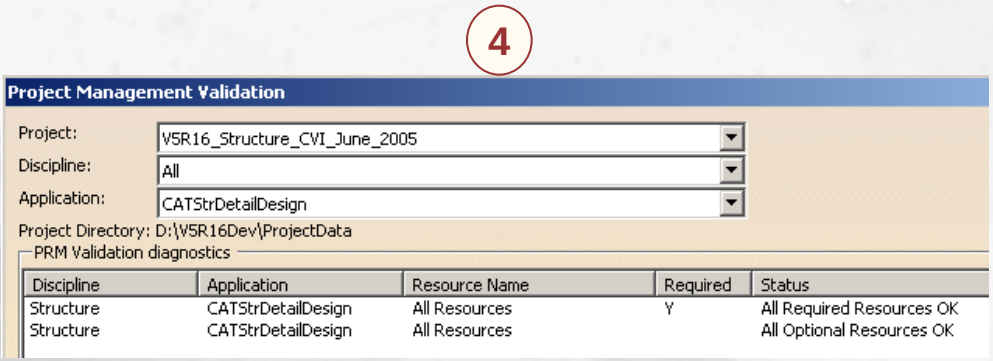
- **The PRM files can be accessed interactively via Tools -> Project Management**

1. The Project Resource Management panel is displayed.
2. Select your current project as the project and “Structure” as discipline and click OK.
3. You can view the resources by selecting the browse button.
4. You can use the “Validation” command to ensure that all the resources are defined correctly, and, to ensure that the defined resources exist.





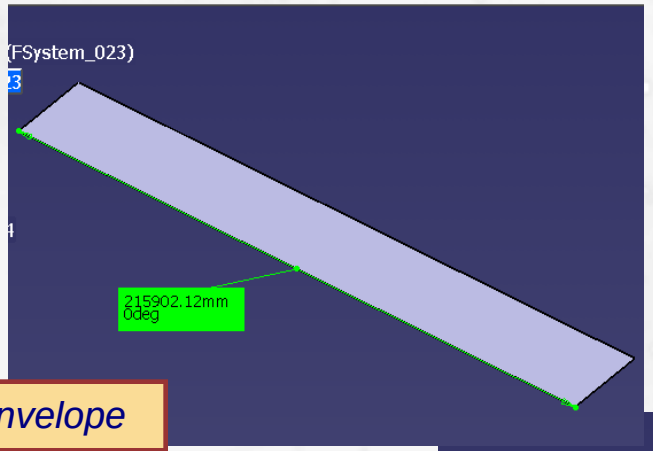




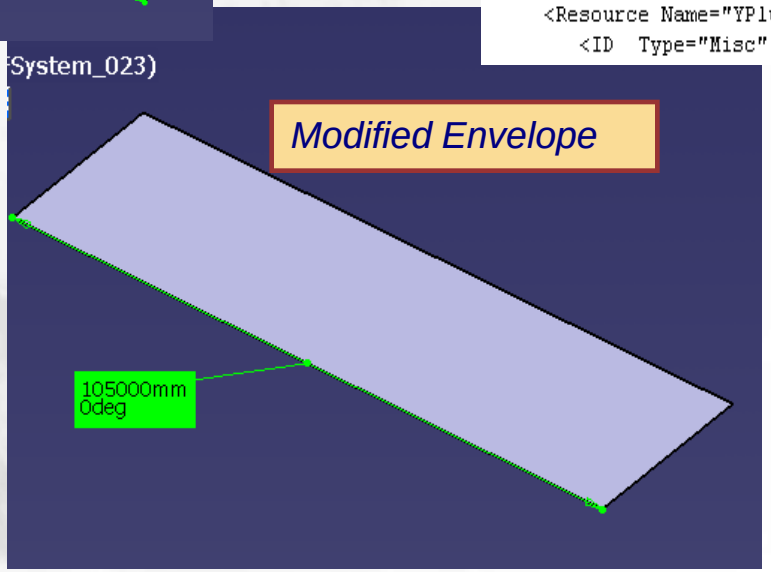
1.2 PRM - Resource Management

Exercise: Project file Definition

- **In this exercise, we will modify the location of the bounding box project xml file and edit the limits of the bounding box**
  - **Place a functional deck to view the default limits of the bounding box.**
    1. Structure Functional System Design -> Creates a new Product
    2. Structure Functional Object Design -> Creates a new Part in the functional system.



Default Envelope



Modified Envelope

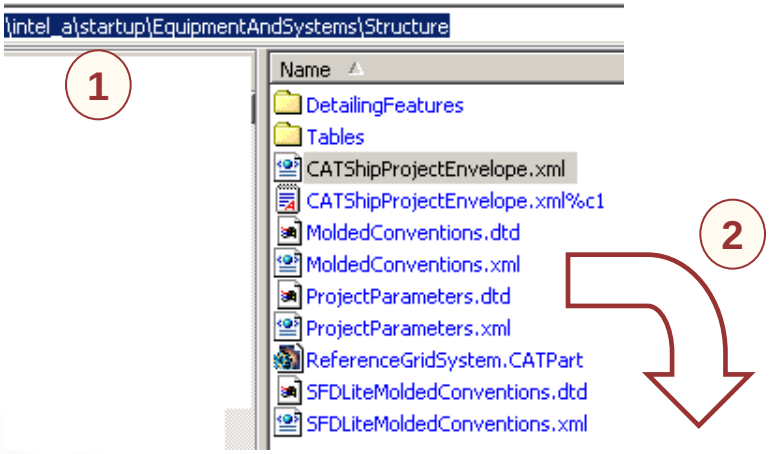
```
<!DOCTYPE Application SYSTEM "Application.dtd">

  <Application Name="CATSPLProjectEnvelope" Description="Structure Prelimin

<!-- ************** Project Bounding Box RESOURCES ************** -->
    <Resource Name="LengthUnit" Description="The Unit used for defining the
       <ID  Type="Misc" Driver="File" Location="mm"/>
    </Resource>
    <Resource Name="XPlusValue" Description="the current value for X+">
       <ID  Type="Misc" Driver="File" Location="230000"/>
    </Resource>
    <Resource Name="XMinValue" Description="the current value for X-">
       <ID  Type="Misc" Driver="File" Location="-10000"/>
    </Resource>
    <Resource Name="YPlusValue" Description="the current value for Y+">
       <ID  Type="Misc" Driver="File" Location="16780"/>
```

CATShipProjectEnvelope.xml

1.2 PRM - Resource Management

Project file Definition (cont):

1. Copy the ***CATShipProjectEnvelope.xml*** file to a folder on the C: drive from *..\..\intel_a\startup\EquipmentAndSystems\Structure*
2. Using wordpad, change the value for the bounding box in the x+ and x-directions. E.g. x+ = 10000mm and x- = -5000mm.
3. Save the xml file.
4. Point to the project envelope xml in the PRM file by keying in the new location.
5. Restart Catia and place functional deck.




```
<!DOCTYPE Application SYSTEM "Application.dtd">

  <Application Name="CATSPLProjectEnvelope" Description="Structure Prelim

<!-- ************** Project Bounding Box RESOURCES ************** -->
    <Resource Name="LengthUnit" Description="The Unit used for defining t
      <ID  Type="Misc" Driver="File" Location="mm"/>
    </Resource>
    <Resource Name="XPlusValue" Description="the current value for X+">
      <ID  Type="Misc" Driver="File" Location="100000"/>
    </Resource>
    <Resource Name="XMinValue" Description="the current value for X-">
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```
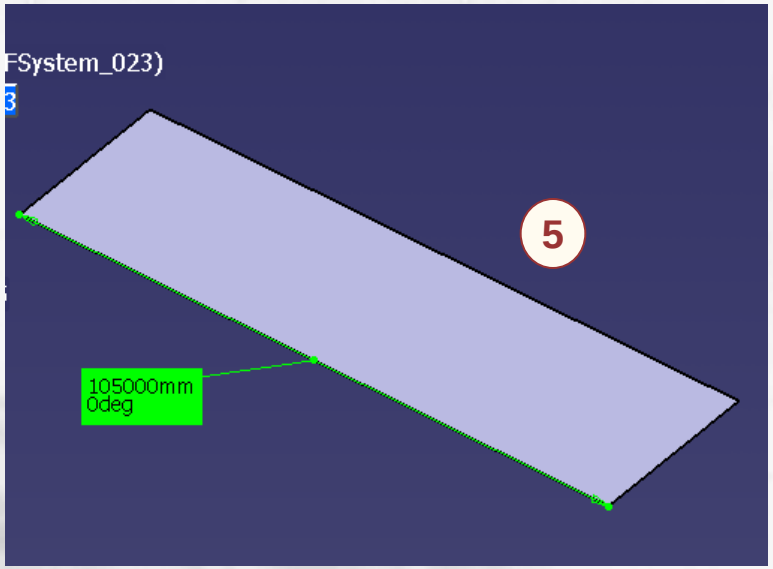
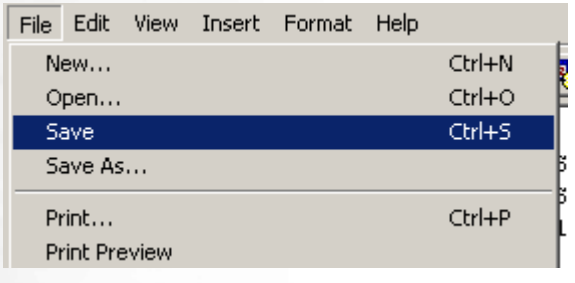
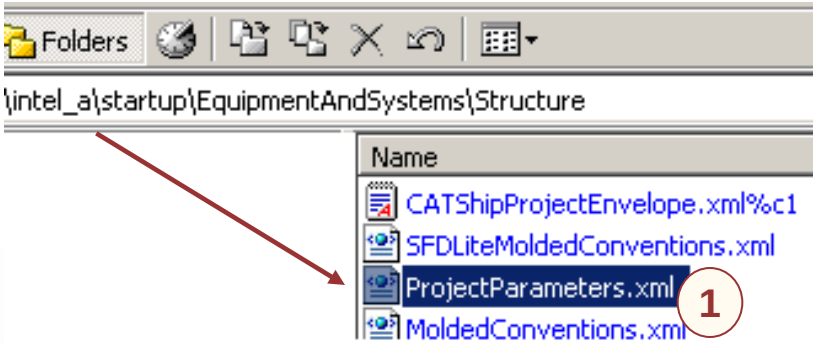





4 PRM XML File

```
<!-- ************** Project Bounding Box RESOURCES ************** -->
  <Resource Name="ProjectEnvelope" Description="Location of bounding box data" Visible = "yes">
    <ID  Type="Catia" Driver="File" Location="C:\SFD_Lite_Training_Data\Proj_Envelope\CATShipProjectEnvelope.xml"/>
  </Resource>
```

1.3 PRM: Molded Conventions – ProjectParameters XML File



Molded Conventions:

1. **Set of rules governing the placement of the structural components. These rules are defined in MoldedConventions.xml file and are based on the ship axis defined by the ProjectParameters.xml file.**
2. **Some important parameters in the ProjectParameters.xml file** :
   - Positioning Orientation – 'Xp' for European convention, 'Xm' for American convention.
   - Management of the Length unit.
   - Management of the Midship and Centerline frames.

- Molded conventions are ignored for categories with implicit orientation. E.g.when placing brackets,you want to ignore molded conventions.
- Category "Other" does not use molded conventions
- Molded conventions ignored for beams

ProjectParameters.xml

2

```
- <ProjectParameters>
    <Positioning FrontOrientation="Xp" />
  - <GeometricData LengthUnit="mm">
    - <CaracteristicPlanes>
        <!--  MANDATORY FOR MOLDED CONVENTIONS (DO NOT CHANGE ITS NAME)  -->
        <PlaneDefinition Name="MidShip" OriginX="0" OriginY="0" OriginZ="0" NormaleX="1" NormaleY="0" NormaleZ="0" />
        <!--  MANDATORY FOR MOLDED CONVENTIONS (DO NOT CHANGE ITS NAME)  -->
        <PlaneDefinition Name="CenterLine" OriginX="0" OriginY="0" OriginZ="0" NormaleX="0" NormaleY="1" NormaleZ="0" />
      </CaracteristicPlanes>
    </GeometricData>
  </ProjectParameters>
```

1.3 PRM: Molded Conventions – MoldedConventions XML File

New R16

Molded Conventions:

1. The MoldedConventions XML file determines the placement rules for the structural objects. For example:
   - For DECK Plates: ThicknessOrient – HP i.e. Horizontal Plus or HM Horizontal Minus.
   - For Longitudinal Bulkhead Vertical Stiffeners: Platesideorientation = LI or LO SectionOrientation = TI or TO, AnchorPoint = WSL or WSR

MoldedConventions.dtd

```
<!ATTLIST SuperPlateClass
   Name            CDATA     #REQUIRED
   ThicknessOrient (HP|HM|LP|LM|LI|LO|TP|TM|TI|TO|OtherI|OtherO)
>

<!ATTLIST StiffenerClass
   Name            CDATA     #REQUIRED
   PlateSideOrient (HP|HM|LP|LM|LI|LO|TP|TM|TI|TO|OtherI|OtherO)
   SectionOrient   (HP|HM|LP|LM|LI|LO|TP|TM|TI|TO|OtherI|OtherO)
   AnchorPoint     (WSR|WSL) #REQUIRED
>

<!ATTLIST StiffenerOnFreeEdgeClass
   Name            CDATA     #REQUIRED
   AnchorPoint     (WSR|WSL|WC) #REQUIRED
>
```

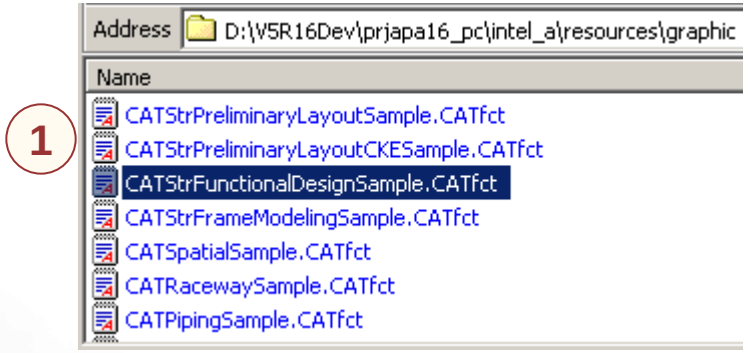
MoldedConventions.xml

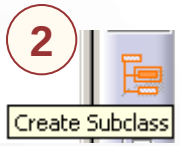
```
<?xml version="1.0" encoding="windows-1252"?>
<!DOCTYPE SFDLiteMoldedConventions SYSTEM "SFDLiteMoldedConventions.dtd">

<SFDLiteMoldedConventions>

   <SuperPlateClass  Name="DeckPanel" ThicknessOrient="HP">

     <StiffenerClass Name="DeckStiffener" PlateSideOrient="HM"  SectionOrient="TI"  AnchorPoint="WSL"/>

       <StiffenerClass Name="DeckLongStiffener" PlateSideOrient="HM"  SectionOrient="LI"  AnchorPoint="WSL"/>

       <StiffenerClass Name="DeckTransStiffener" PlateSideOrient="HM"  SectionOrient="TI"  AnchorPoint="WSL"/>

   </SuperPlateClass>


   <SuperPlateClass  Name="LongitudinalPanel" ThicknessOrient="LI">

     <StiffenerClass Name="LongBulkhdStiffener" PlateSideOrient="LO"  SectionOrient="HP"   AnchorPoint="WSL"/>

       <StiffenerClass Name="LongBulkhdHorStiffener" PlateSideOrient="LO"  SectionOrient="HP"   AnchorPoint="WSL"/>

     <StiffenerClass Name="LongBulkhdVerStiffener" PlateSideOrient="LO"  SectionOrient="TI"   AnchorPoint="WSL"/>

   </SuperPlateClass>
```

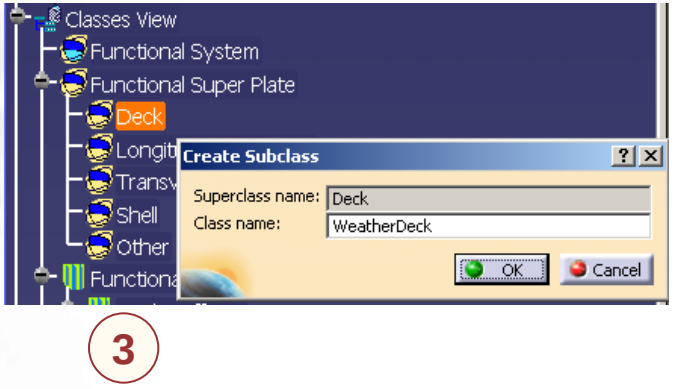
2.1 CATfct Integration: Creation/Management of Functional Classes

Addition of Functional Subclasses:

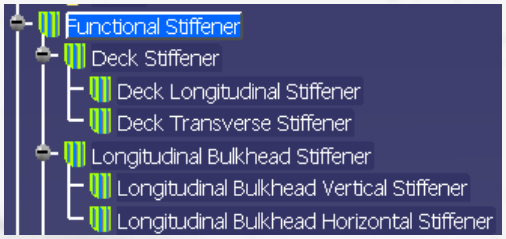
1. Open the SFD Sample Feature Dictionary (ensure that the CATfct file has write privileges). ***CATStrFunctionalDesignSample.CATfct***
2. Select the “Create Subclass” icon.
3. Add a new Functional Subclass (e.g. WeatherDeck) by activating the “Deck” node. Click OK.
4. The new functional class is added.







Note: Same data model for SFD and SDD, single user dictionary.



Note: Classes referenced by the feat file cannot be deleted.

Newly created subclass.

2.2 CATfct Integration: Creation/Management of Attributes

Addition of Attributes in the CATfct file and management of discrete attributes.

1. Activate the Functional Subclass that was added in the previous page.
2. Select the “Add Attribute” icon

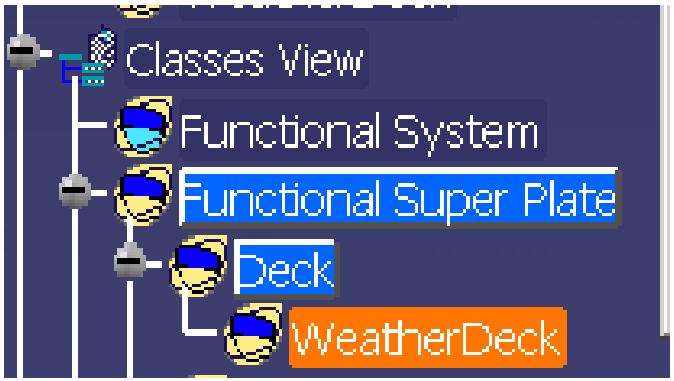
3. In the Add Attribute dialog box, key in the following:

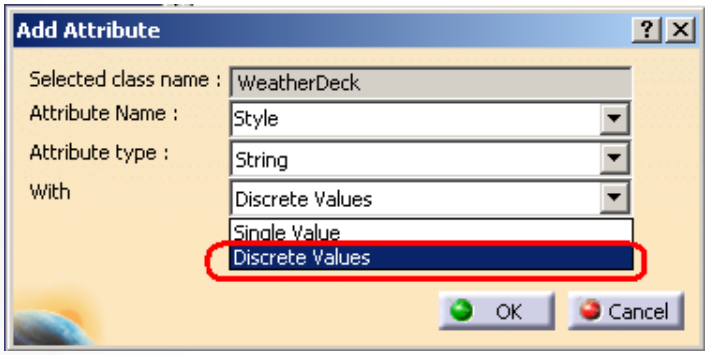
   Attribute name: Style

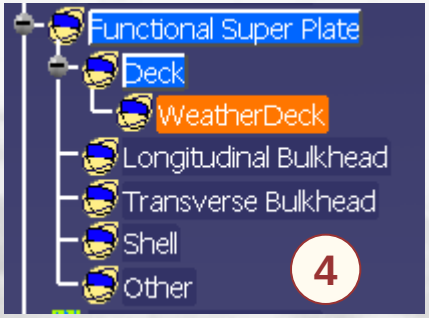
   Type: String

   This attribute will have discrete Values.

4. A discrete attribute is created. Save the Feature Dictionary.







Local attributes

Name	User	Type	Value
Style	User	String	<Discrete>

Note: Local attributes are propagated to the subclasses that belong to the superclass. For the subclasses, these attributes will reflect as inherited attributes.

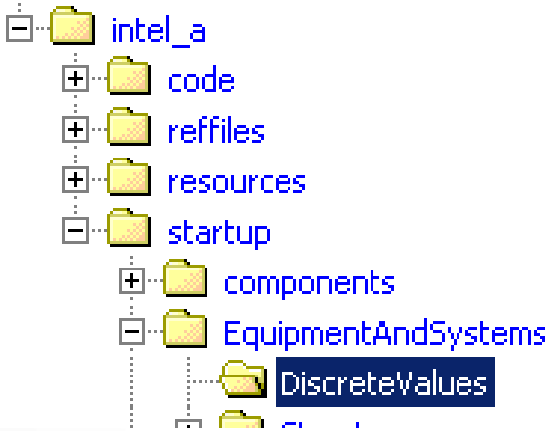
2.2 CATfct Integration: Creation/Management of Attributes ...continued

Creating the discrete list of attribute values.

1. In the startup *\intel_a\startup\EquipmentAndSystems\DiscreteValues* folder, create a file with the same name as the attribute name. (e.g. Style.txt).
2. Add the discrete attributes to the text file.

   Save the discrete list file.

1



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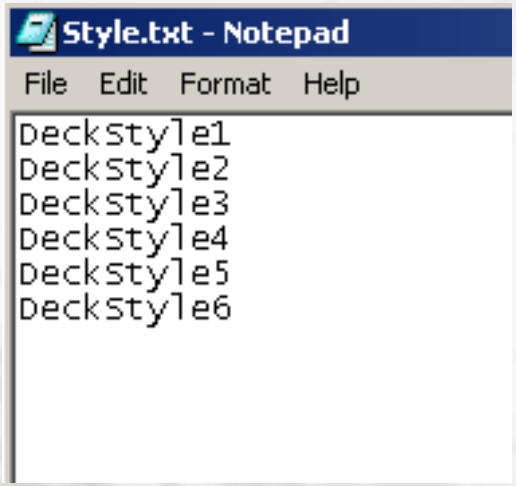
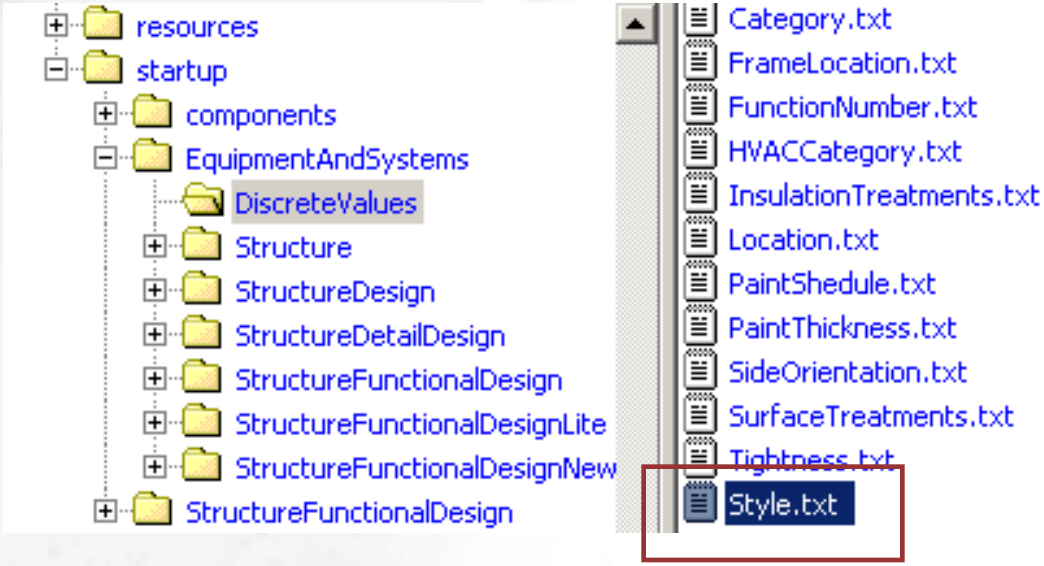
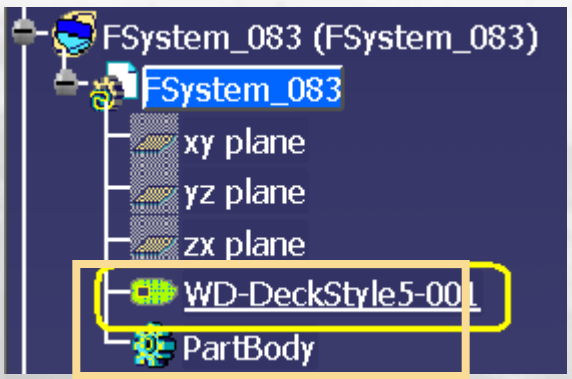




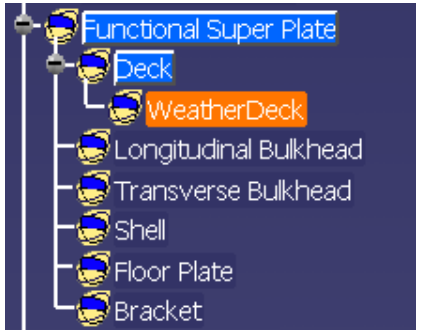
2.3 CATfct Integration: ID Schema Integration

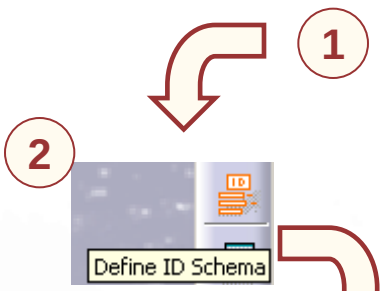
Creating an ID Schema for the Functional Class

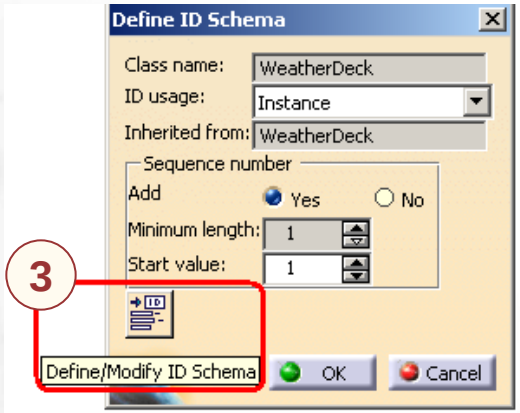
1. Open the Structures Feature Dictionary document. ***CATStrFunctionalDesignSample.CATfct***
2. Double-click (activate) the functional class that you created in the previous pages.
3. Select the “Define ID Schema” icon
4. From the “Define ID Schema” dialog box, select the “Define/Modify ID schema” button.
5. Modify the schema by adding a schema. (You can experiment with the other options that are available in this dialog box.
6. Click OK to complete the definition of the schema.
7. Click OK to exit the Define ID Schema dialog box..



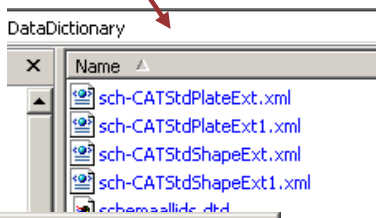
ID is reflected when placing the components into the design document.

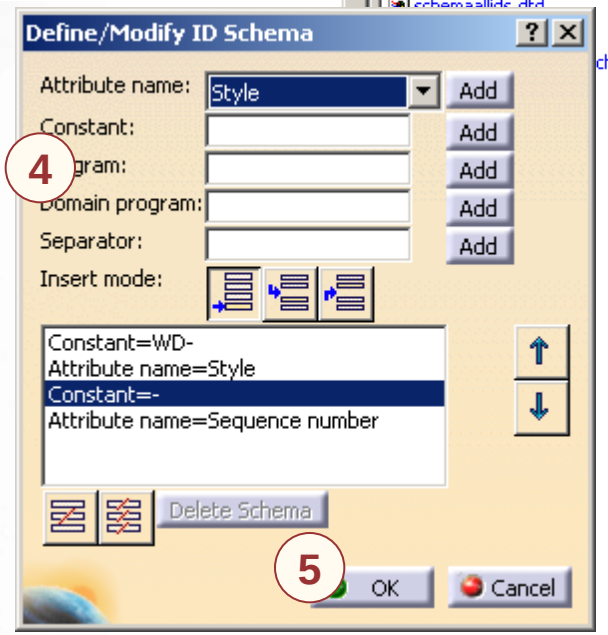






Note: ID schema is saved in the data dictionary folder. Child classes inherit the schema from parent if undefined.





2.4 Color Management based on Object Classes

Some Important Points for Color management.

1. Just as in ID Schema management, Color is managed via the PRM file.

```
************** Color SCHEMA RESOURCES ************** -->
<Resource Name="StrFunctionalDesignColorSchema" Description="Structure Functional Design Color Schema Directory">
        <ID  Type="Path" Driver="File" Location="${Startup_Directory}\StrFunctionalDesign\DataDictionary"/>
</Resource>
```

2. The default location referenced in the PRM file is:
..\..\..\intel_a\startup\EquipmentAndSystems\StrFunctionalDesign\DataDictionary

3. The color change is saved in the respective XML file. For example, when the color for the Deck is changed, the respective file **clr-DeckPanel.xml** will contain the reference to the new color.

```
<?xml version="1.0" ?>
<!DOCTYPE Doct (View Source for full doctype...)>
- <Doct>
    <schema_Color seq_RED="255" seq_BLUE="128" seq_GREEN="128" />
  </Doct>
```

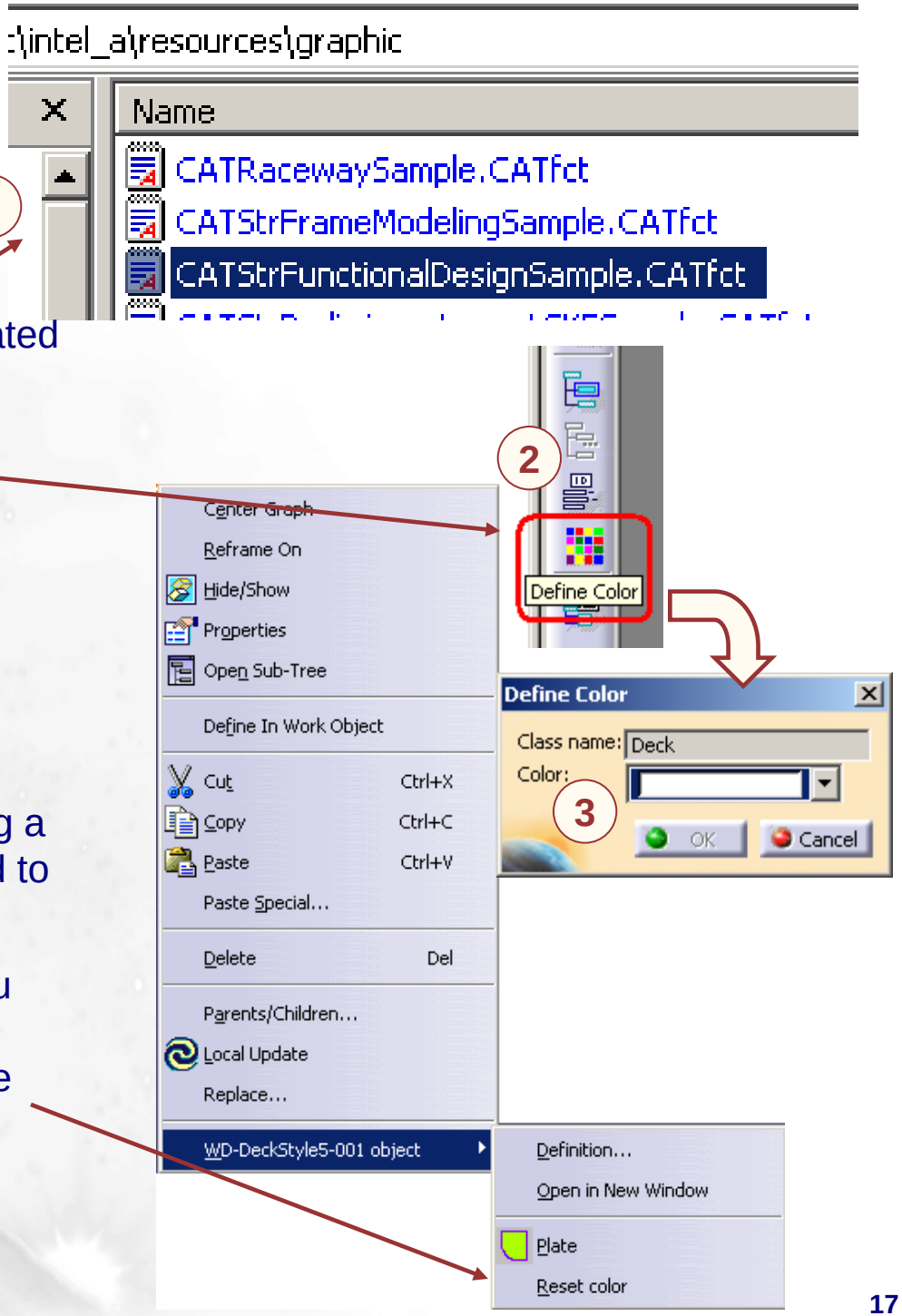
4. The data is saved into the xml file therefore, you need to ensure that you have write access to the files referenced by the PRM resource.

5. Just as in ID Schema, if color is not defined on a particular subclass, it is inherited from the parent class.

2.4 Color Management based on Object Classes ...continued

Management of object colors based on subclasses.

1. Open the SFD/SDD Feature Dictionary located in ..\..\..*intel_a\resources\graphic.*
2. Click on the “Define Color” Icon.
3. Select the Subclass (e.g. Deck), select the appropriate color and click OK to exit the “Define Color” dialog box.
4. Close the Feature Dictionary.
5. Restart Catia
6. The new color will be reflected when placing a component from the subclass that you used to define the color.
7. If you have changed the color manually, you can use the “ResetColor” command by rightclicking on the object or in the spec tree



3.1 Managing Sections: Use existing section and add the simplified representation

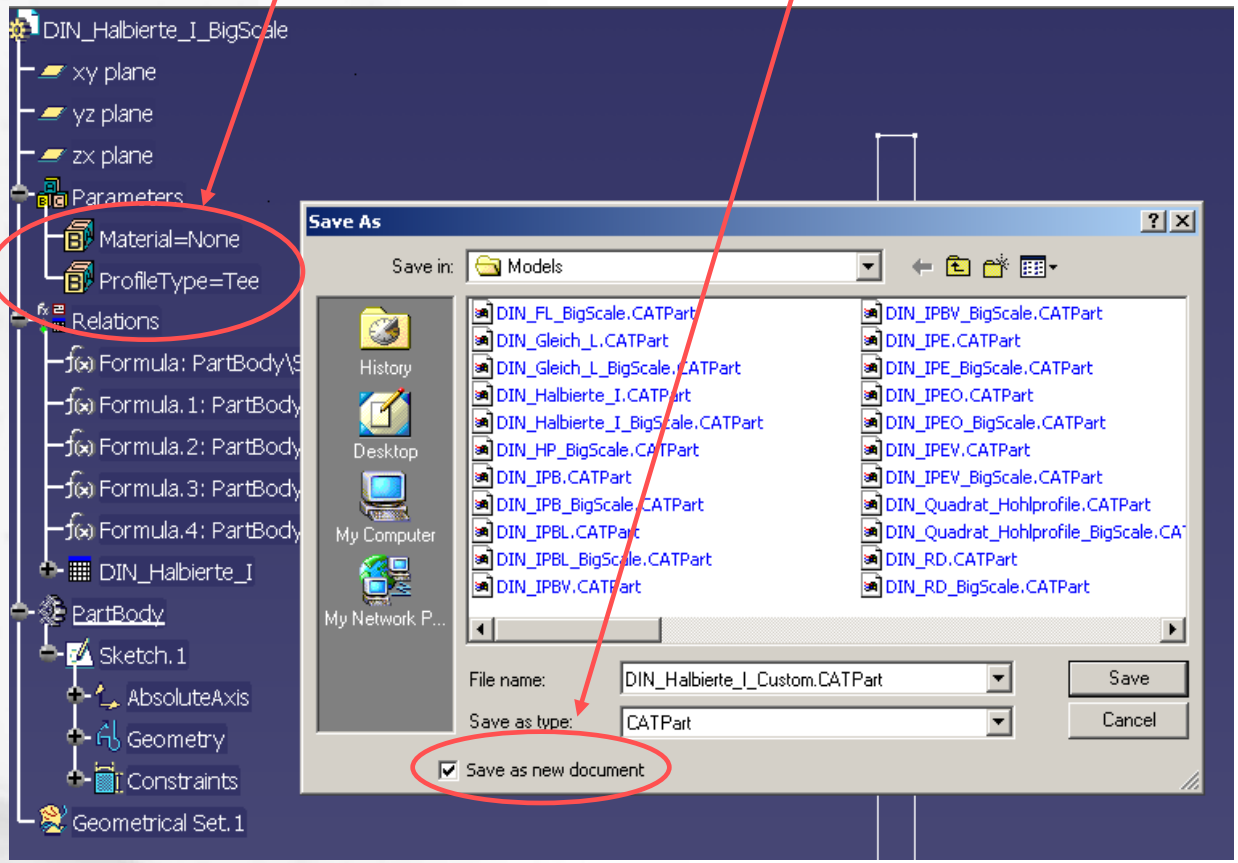
If a site needs to build a new section (parametric or resolved), it is the recommended best practice to start from an existing section and perform a "Save as New" on this custom section. By starting from an existing section, you are ensured that the mandatory parameters are already created and available for edition.

New R16

Open the CATPart (*DIN_Halbierte_I_BigScale.CATPart*) located in ..\\intel_a\startup\components\StructuralCatalogs\DIN\Models. (or a section that you would like to modify).

If you intend to customize this as a "new" section, use the "save as New" option. This may be necessary if you are creating a custom section for your project.

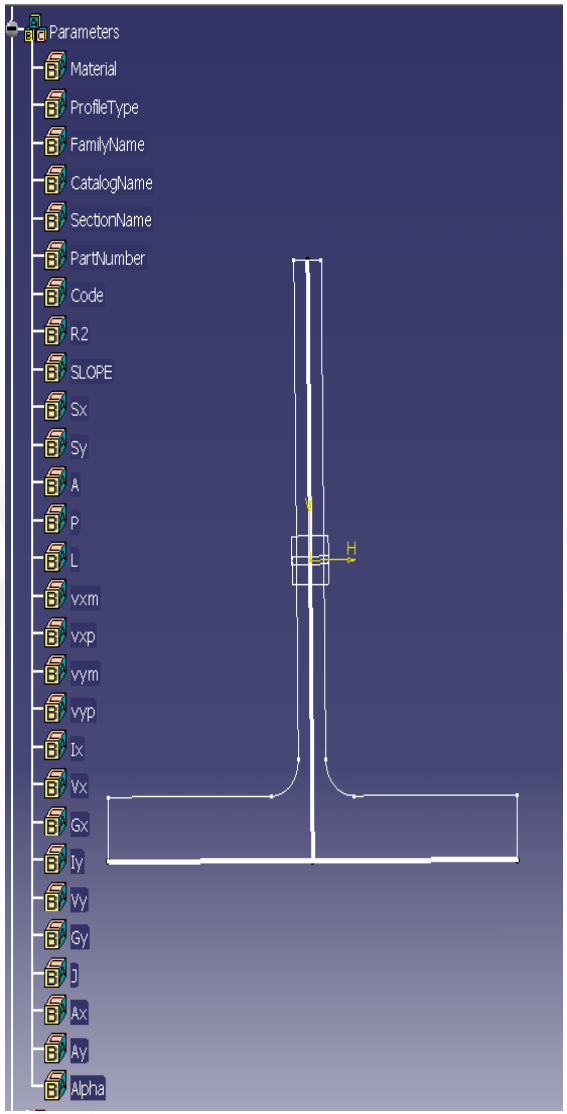
Before adding the single representations, you can modify the custom section and ensure that the user parameters are defined. (Please refer to next slide for list of mandatory parameters)



3.2 Managing Sections: Description of Section Parameters

Sections parameters description

- *Mandatory for structure application:*
  - SectionName: parameter coming from a key word of the section catalog
  - A: Cross-sectional area
  - ProfileType: Tee, Channel, RectangularBar, Beam, Angle, Pipe, RectangularHollow
  - FamilyName: parameter coming from a key word of the section catalog
  - CatalogName: parameter coming from a key word of the section catalog
  - R2: Radius parameter
  - SLOPE: Angle parameter
- *Mandatory for Analysis*
  - Sx: Section modulus along x axis
  - Sy: Section modulus along y axis
  - P: linear weight (kg/m assuming that the material used is steel: 7850kg/m3)
  - L: Span length
  - Vxm: Distance between COG and the farthest point on the section along –x
  - Vxp: Distance between COG and the farthest point on the section along x
  - Vym: Distance between COG and the farthest point on the section along -y
  - Vyp: Distance between COG and the farthest point on the section along y
  - Ix: Moment of inertia along x axis
  - Vx: Inertia modulus along x axis
  - Gx: Radius of gyration with respect to the x axis
  - Iy: Moment of inertia along y axis
  - Vy: Inertia modulus along y axis
  - Gy: Radius of gyration with respect to the y axis
  - J: Torsional constant of a cross-section
  - Ax: Computed Surface with respect to the x axis
  - Ay: Computed Surface with respect to the y axis
  - Alpha: Ratio of hybrid girder web yield stress to flange yield stress.
- *Legacy parameters:*
  - [PartNumber]: -Not used- Was mandatory for parametric design table in previous releases
  - [Material]: -Not used- Was created systematically in any CATPart in previous releases
  - [Code]: -Not used- Was mandatory for parametric design table in previous releases



3.3 Managing Sections: Adding the Web attributes for the molded conventions

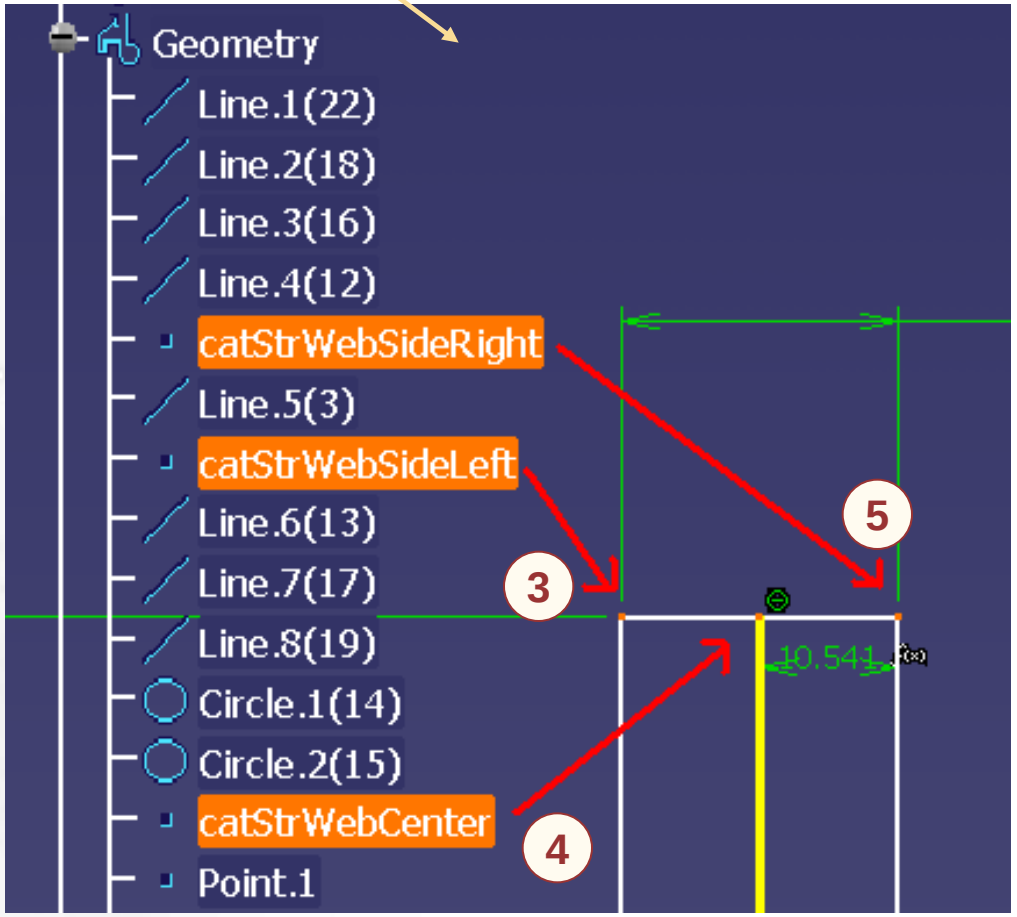
Adding a simplified representation to an existing section:

1. Using the Part Design Workbench, doubleclick the sketch to invoke the sketcher.

- Note: For parts that need the edge of the web to be welded to the plate, e.g. 'L', 'T', FL, 'Bulb' sections, you need to rename the points that define the left, center, and right of the web section. This will allow the section to locate correctly when placed on the plates.

3. Rename the left point in the sketcher as catStrWebSideLeft
4. Rename the center point as catStrWebCenter
5. Rename the rightmost point as catWebSideRight

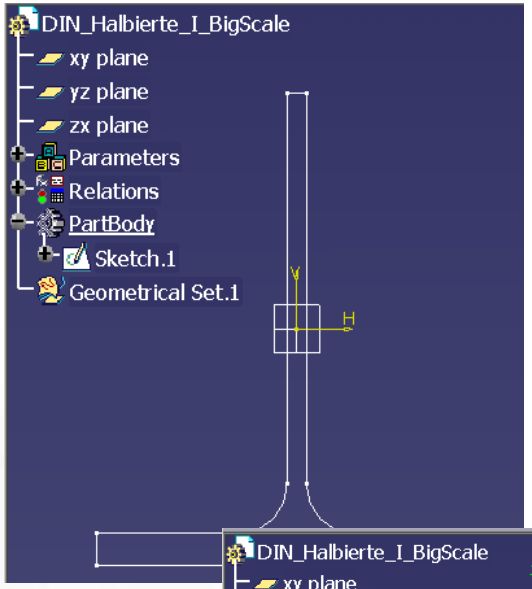
Rename points for molded conventions

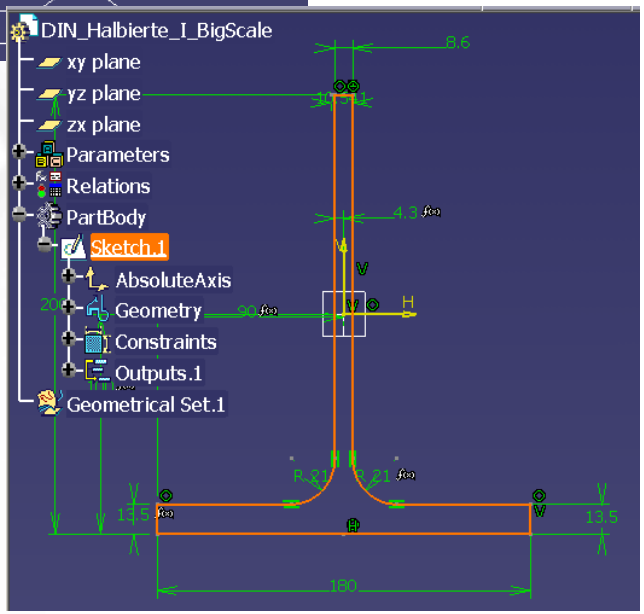


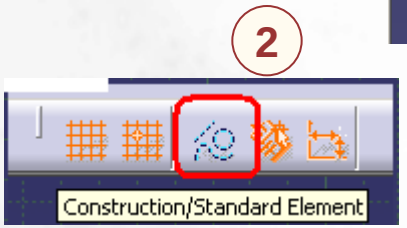
3.4 Managing Sections: Adding a simplified Representation

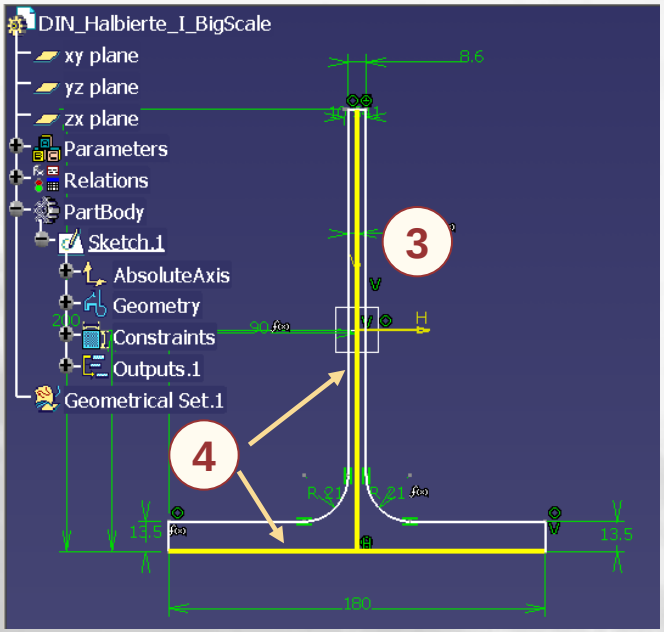
Adding a simplified representation to an existing section:

1. Using the Part Design Workbench, doubleclick the sketch to invoke the sketcher.
2. Ensure that the “Construction/Standard Element” option is not set.
3. Sketch the simplified representation.
4. Select the two lines that you created for the simplified representation,





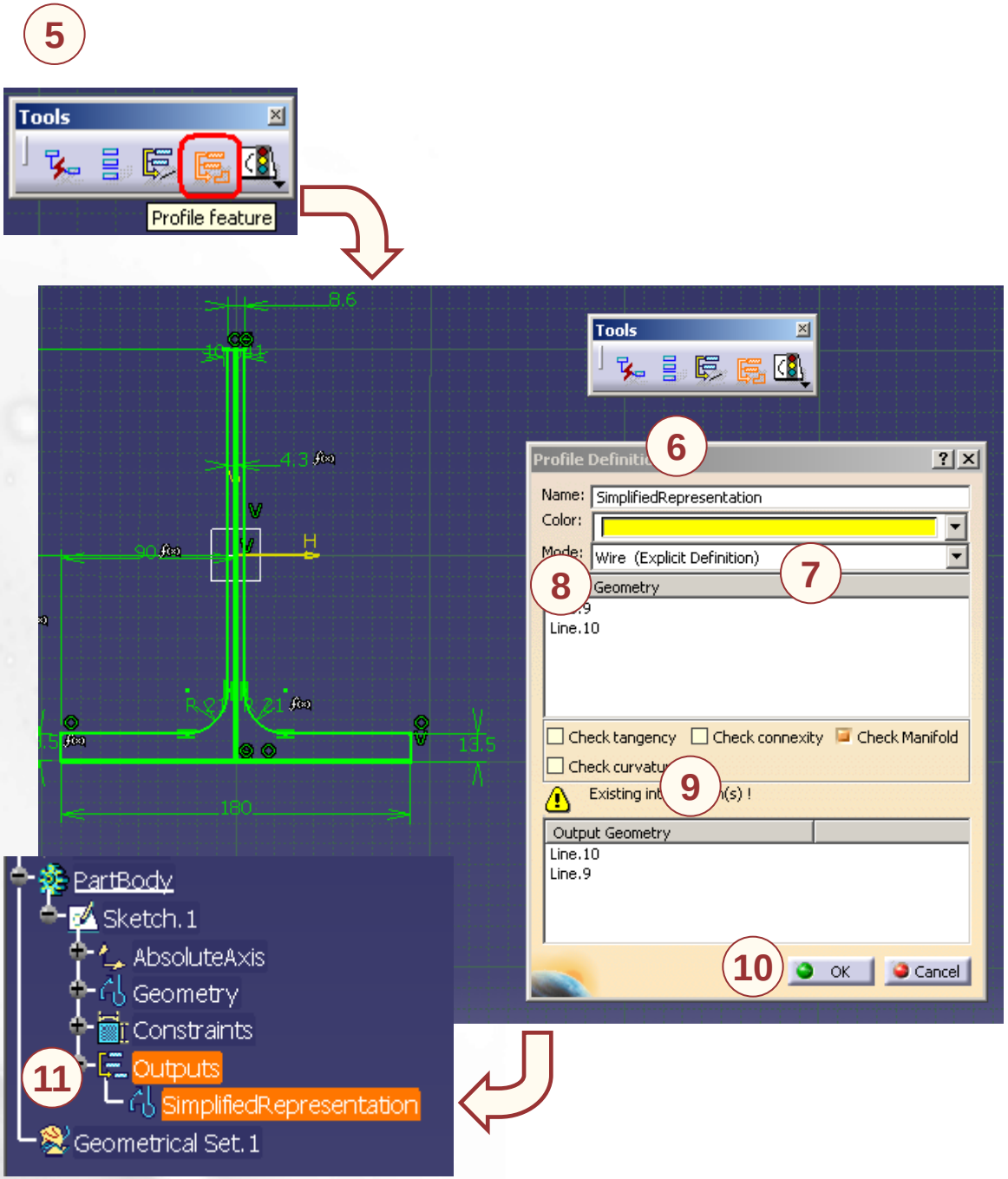




3.4 Managing Sections: Adding a simplified representation

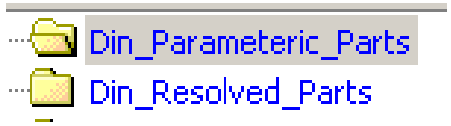
Cont..

5. In the “Tools” toolbar, select the “Profile Feature” button.
6. Change the Name to “SimplifiedRepresentation” and ensure that the Input Geometry and Output Geometry areas display the sketch lines that you have selected.
7. Change the Color (e.g. Yellow).
8. Change the “Mode” field to “Wire (Explicit Definition).
9. Ensure that the “Check Connexity” button is NOT set.
10. Click OK to exit the profile definition dialog box.
11. The simplified representation should display in the spec tree.
12. Save the CATPart.



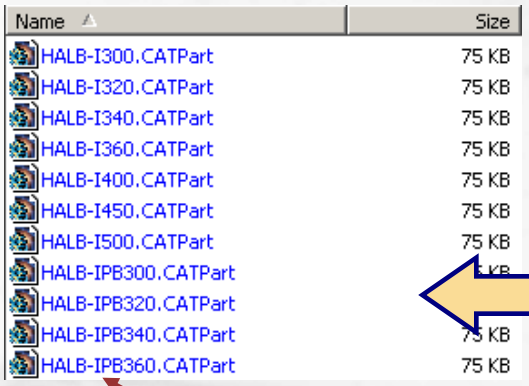
3.5 Managing Sections: Resolving the section containing the simplified rep.

1. Use the input directory containing the parametric sections
2. Create an output directory for the resolved sections.
3. Execute the command CATCloGenerateResolvedParts.bat located in ...\intel_a\code\command
4. Refer to the syntax and the required parameters below:



Remember to use the –appl Structure option

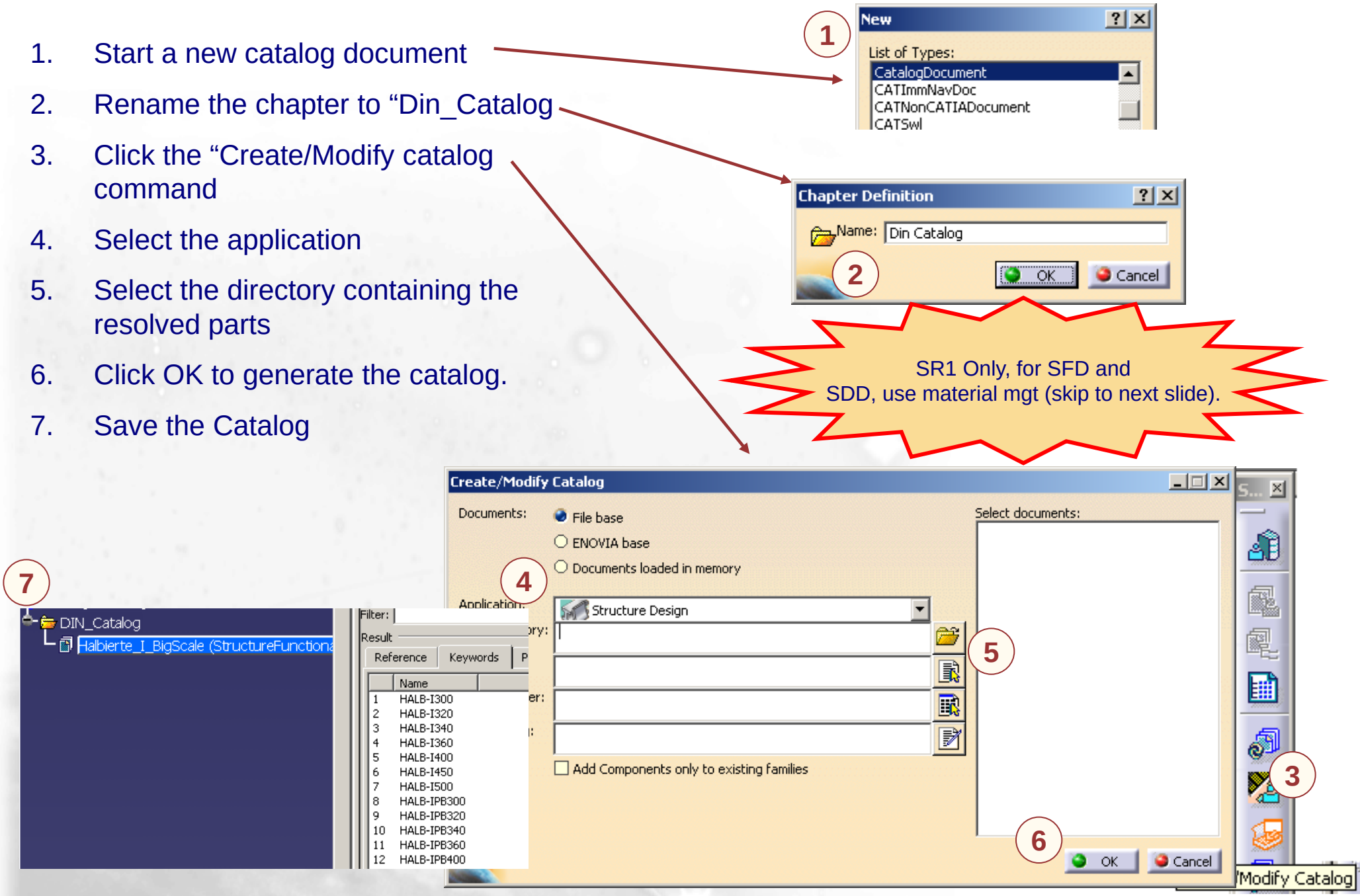
```
BATCH GENERATION OF V5 Resolved Parts from V5 Parametric Parts
   This batch program generates resolved V5 CATParts from
   parametric V5 CATParts with a design table containing
   part numbers and other parametric parameters.
   Linked CATShapes, when applicable, are also generated.

Usage:

   CATCloGenerateResolvedParts.bat -h
   CATCloGenerateResolvedParts.bat [-installdir dir] DirectoryPathIn [Dir

   -h                  : Print this help.
   -installdir dir     : CATIA installation directory.
   DirectoryPathIn     : Part Directory Path Name, full path name
                         to the directory containing the
                         parametric CATParts/CATShapes.
   DirectoryPathOut    : Part Directory Path Name, full path name
     (optional)          to the directory containing the generated
                         resolved CATParts/CATShapes.
   -appl applname      : Application name  (e.g., -appl Structure,
     (optional)          because structure has special handling.)

   If the CATIA installation directory is not specified, the batch
   assumes the directory is where the batch is located.
   It should be in installdir\intel_a\code\command.

D:\V5R15Dev\CXR15\intel_a\code\command>CATCloGenerateResolvedParts.bat -i
tructuralCatalogs\DIN\Din_Parameteric_Parts D:\V5R15Dev\prjapa15\intel_a\
```



Resolved sections are created in the referenced directory

3.6 Managing Sections: Adding the resolved sections to the catalog for SR1.

1. Start a new catalog document
2. Rename the chapter to “Din_Catalog
3. Click the “Create/Modify catalog command
4. Select the application
5. Select the directory containing the resolved parts
6. Click OK to generate the catalog.
7. Save the Catalog



3.6 Managing Sections: Catalog management for the resolved sections for SFD/SDD:

a) Manage the thickness CATpart(s).

b) Create your Structural Specifications catalog

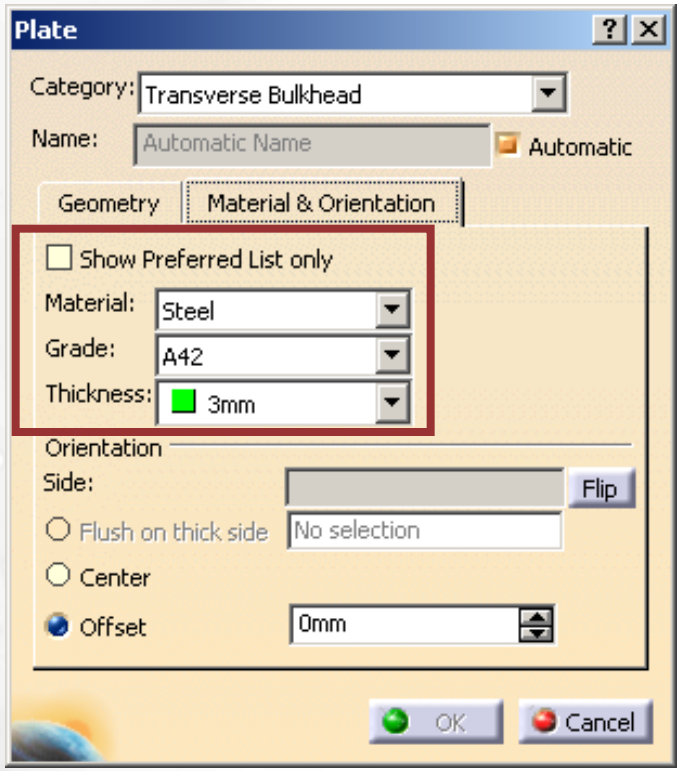
- Add the thickness part to each plates family
- Add the resolved sections to each profile family
- Manage keyword value (Y/N) for each section. Ignored at family level

c) PRM resource -> Standard and Specification Catalog

For R16, when placing structural components, there is a new concept – material mgt. Components are placed based on the structural standard, material, and grade.

New R16

SFD/SDD Only



3.6 (a) Managing Sections: Manage the thickness CATpart(s).

New R16

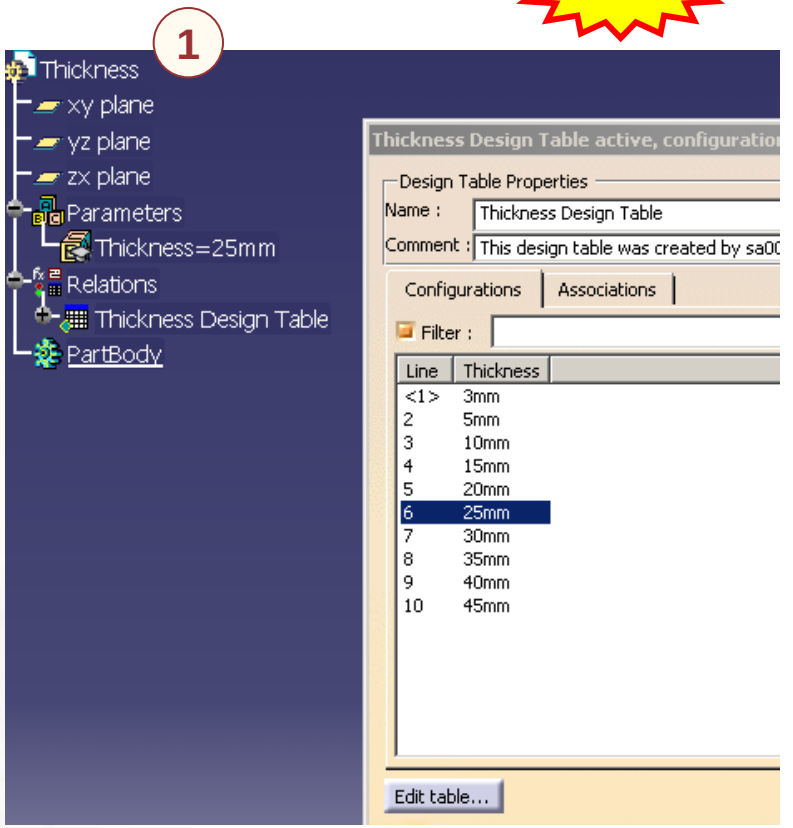
1. Open the sample Thickness CATPart provided to you. Location:

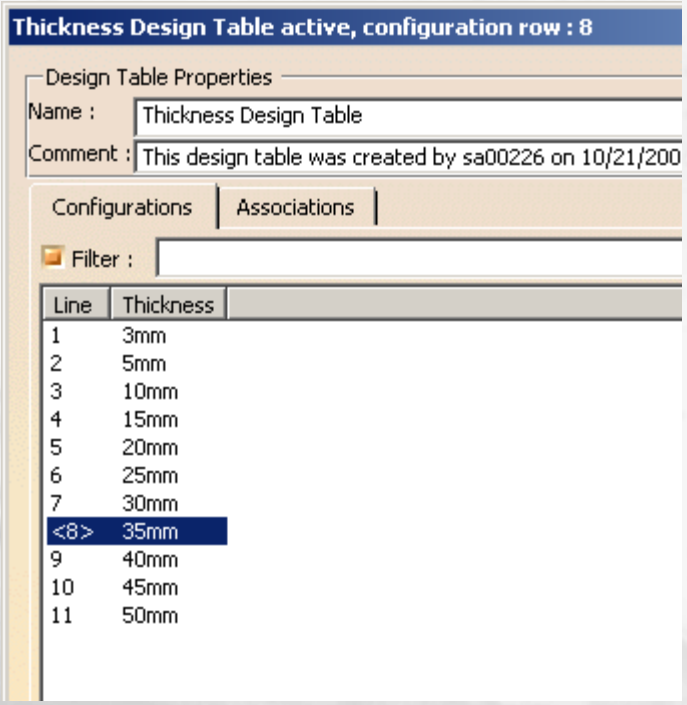
   \intel_a\startup\components\StructuralCatalogs\Materials.

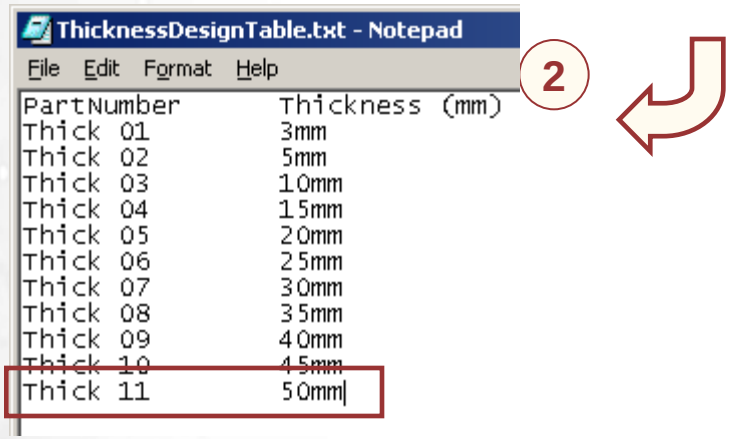
   Filename: Thickness.CATPart (Ensure that you have write access to the part and the design table text file).

2. Click on the “Edit Table” button and add a new thickness at the end of the list, add the entry Thick 11 – 50mm (tab delimited). Save the text file.

3. Save the thickness CATPart.



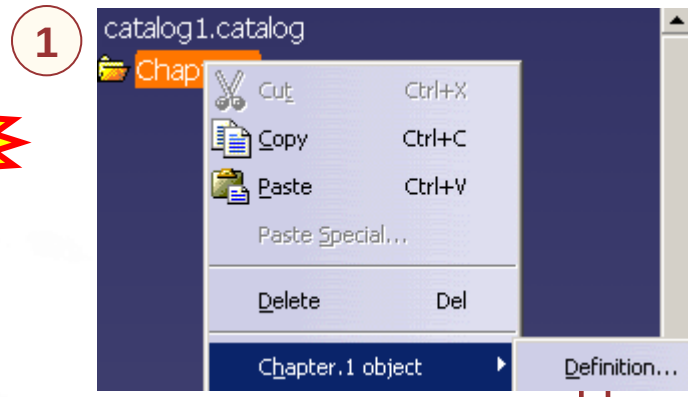


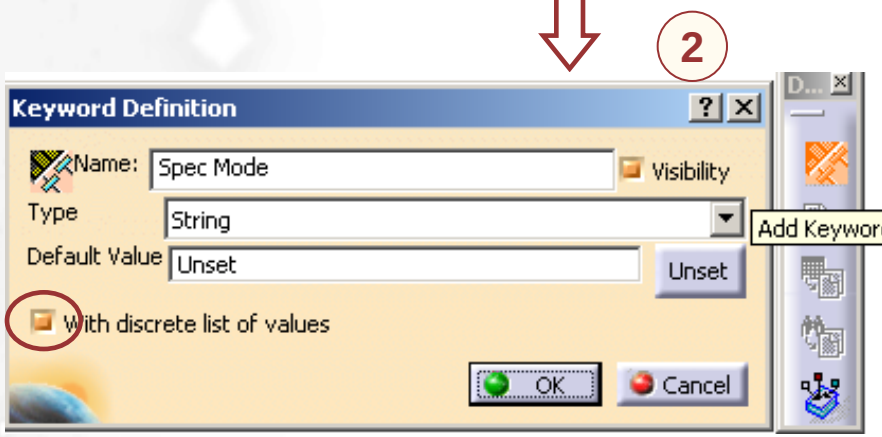


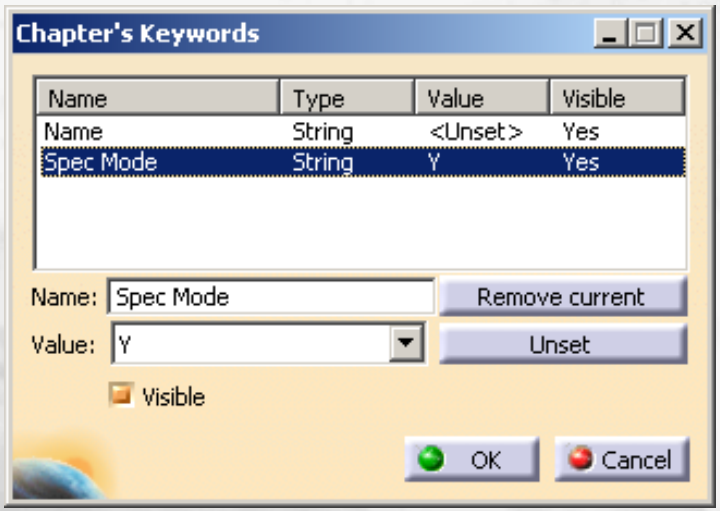
3.6 (b) Managing Sections: Catalog management for the resolved sections for SFD/SDD:

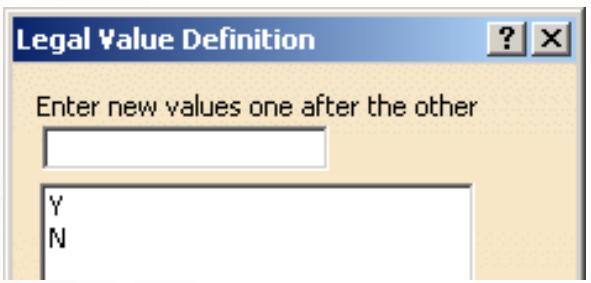
1. Start a new catalog document. Edit definition (right click) on the chapter and rename it (Specifications)
2. Add a new **Discrete** keyword (String) to the Specification chapter (Keyword name "Spec Mode"). Downstream, this keyword will act as a filter whether sections are to be flagged as spec or unspec. At the family level, you will be able to set the keyword (Y/N). Enter the legal values (upper case) Y and N. Ckick OK.
3. Set default to Y.

New R16









3.6 (b) Managing Sections: Catalog management for the resolved sections for SFD/SDD:

New R16

3. Note: the standard is reflected in the PRM file.

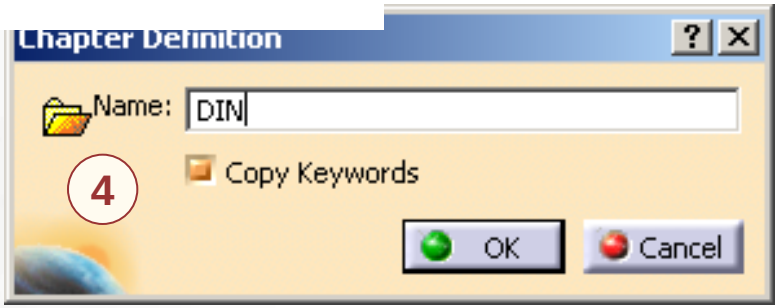
Default is AISC, we will change this standard to DIN in the PRM later

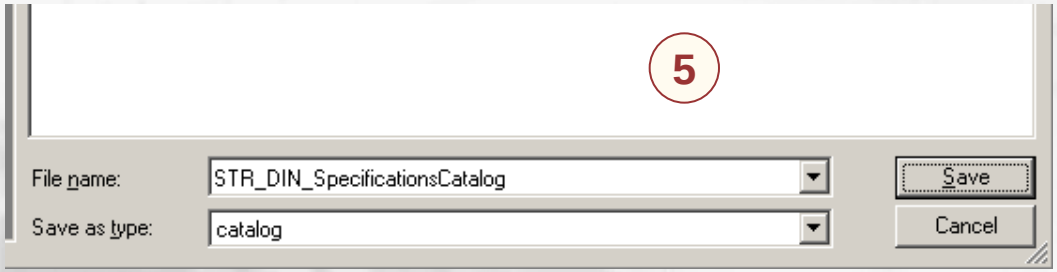
3

```
<!-- ************** Structure Standards ************** -->
     <Resource Name="StructureStandards" Description="Possible Standa
   <ID  Type="Misc" Driver="File" Location="AISC"/>
     </Resource>
```

4. Add the chapter for the Standard. Make sure to check the “Copy Keywords” option

5. Save your Catalog.

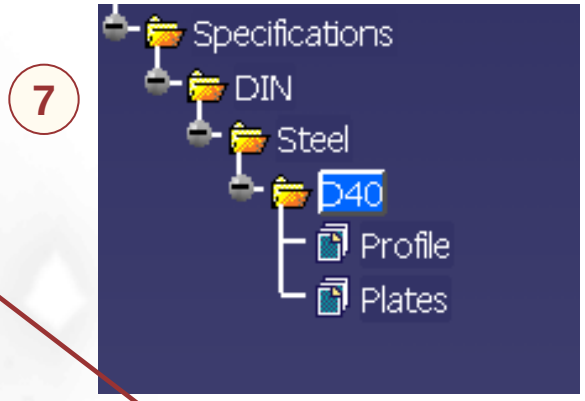




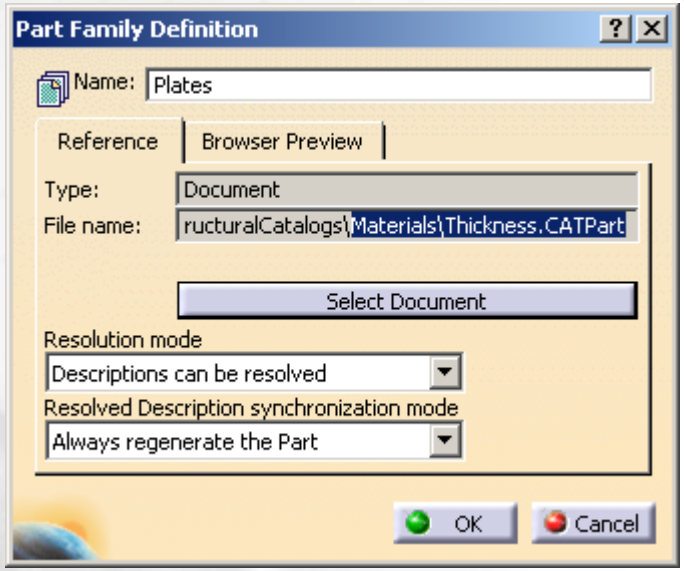
3.6 (b) Managing Sections: Catalog management for the resolved sections for SFD/SDD:

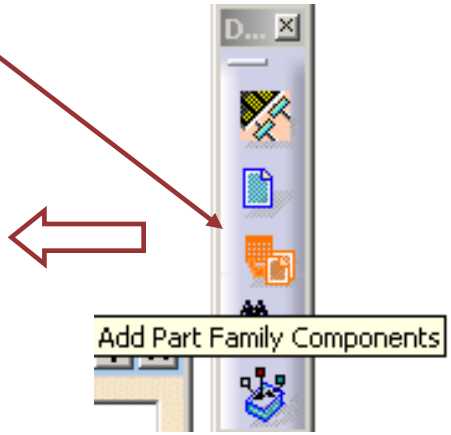
6. Add a chapter for the material (Steel) and add a chapter for the material grade (D40). – this is only an example, the actual DIN catalog will have specific grade names.

7. Add two families under the grade chapter.
   - Profile- For the Resolved Sections
   - Plates – For the Thickness



8. Add the thickness list in the Thickness CATpart to the plates family:
   - Activate the Plates family.
   - Select the “Add Part Family Components” icon.
   - Select the thickness CATpart.
   - Click OK

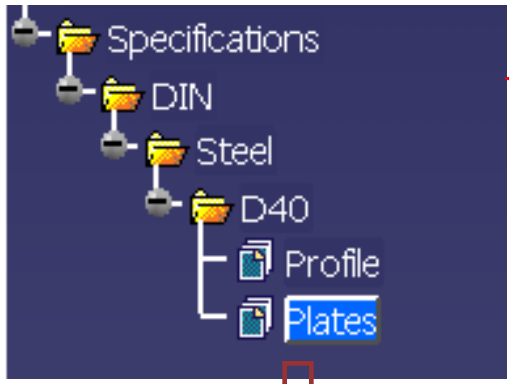


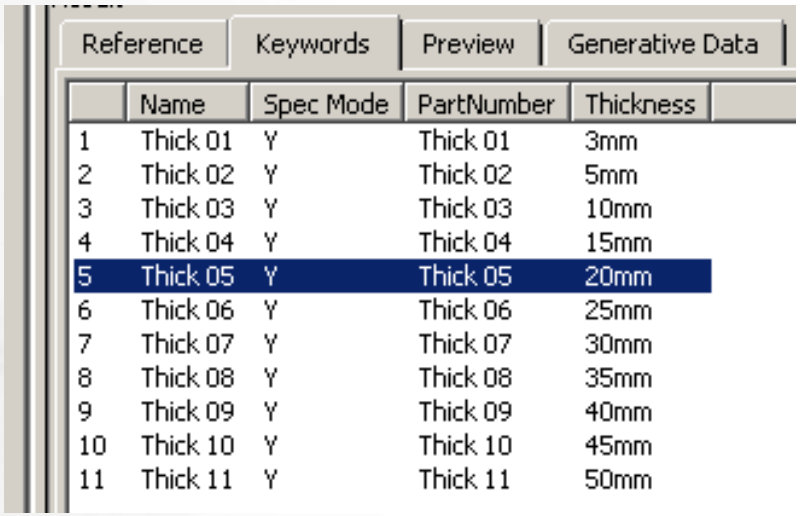


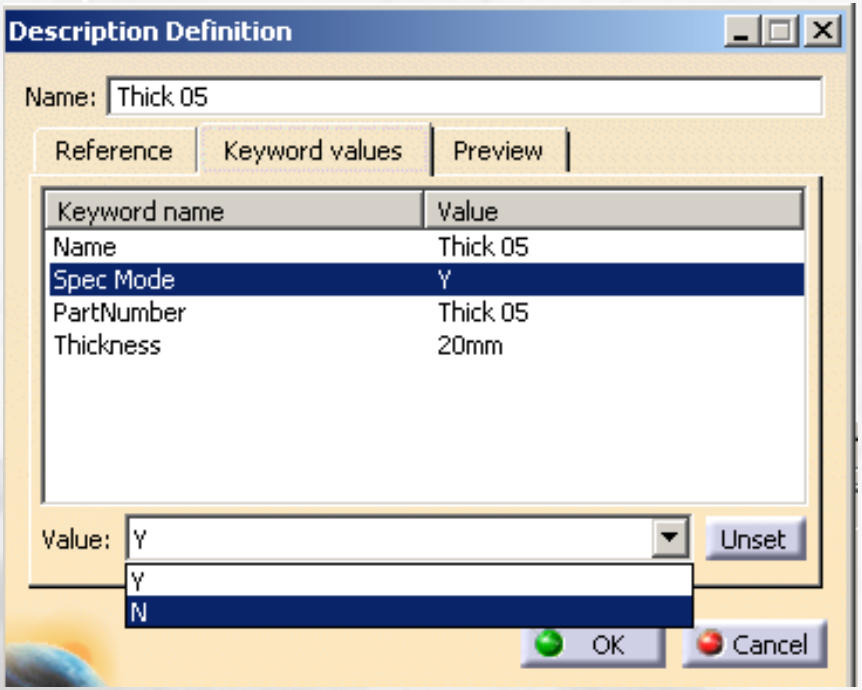
Note: Currently we only support “Plates” and “Profile” families.

3.6 (b) Managing Sections: Catalog management for the resolved sections for SFD/SDD:

9. The thickness list is resolved and added to the “Plates” family. You can change the keyword value of each of the thickness entries by double clicking it and by selecting individual descriptions.



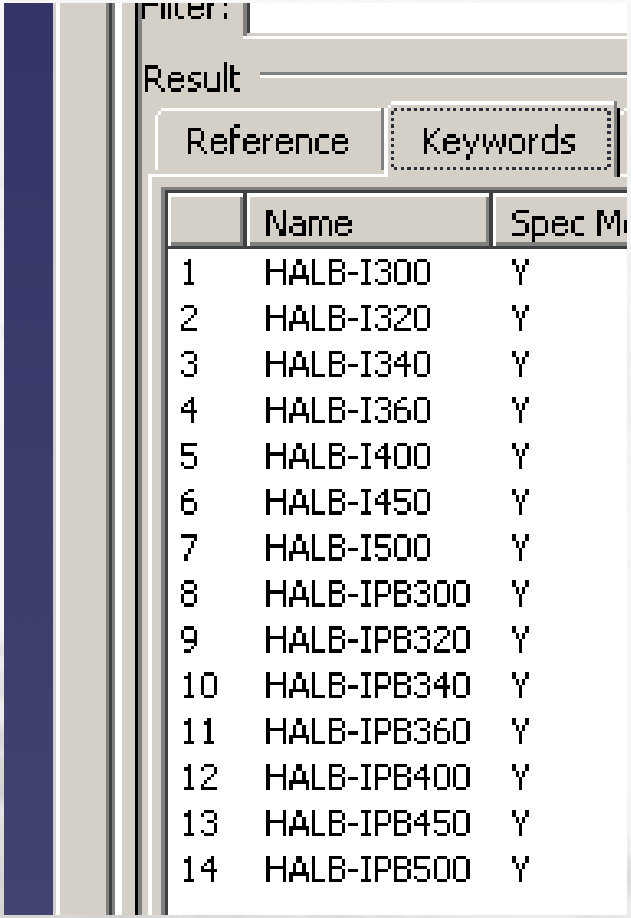


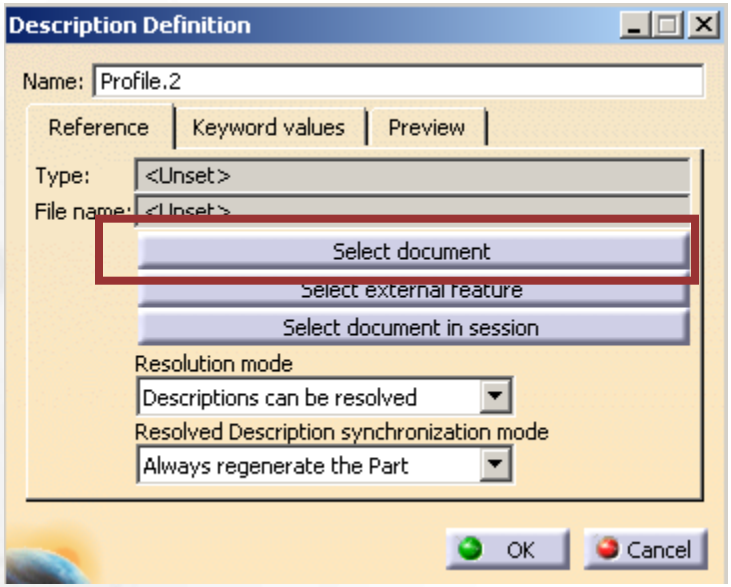


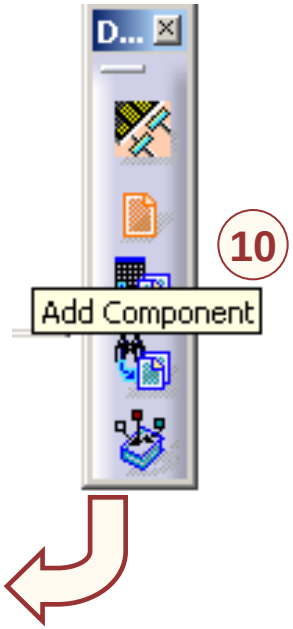
3.6 (b) Managing Sections: Catalog management for the resolved sections for SFD/SDD:

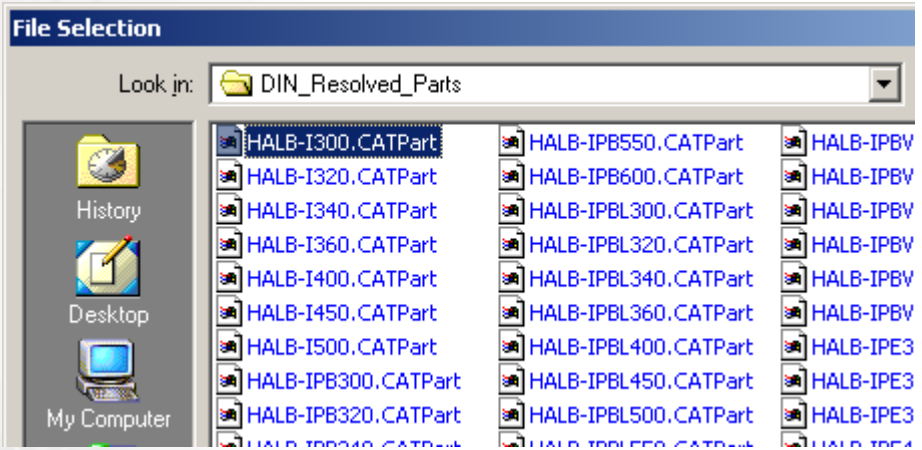
New R16

10. Adding the sections to the Profiles family: For adding the resolved sections to the Profile family, we will use the “Add Component” icon and select each resolved section. Add the following sections from the resolved catalog (for this exercise, we will add the first 14).





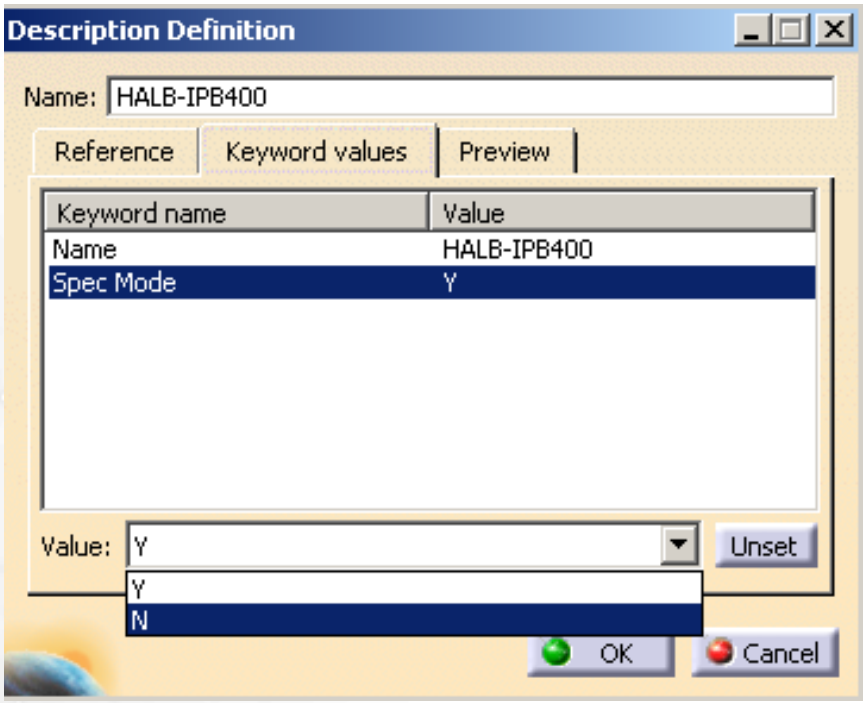




3.6 (b) Managing Sections: Catalog management for the resolved sections for SFD/SDD:

New R16

10. Using the same procedure as on page 30, set the keyword for the sections in rows 5 thru 10 to N by double-clicking each entry and changing the keyword value to N.



10

	Name	Spec M
1	HALB-I300	Y
2	HALB-I320	Y
3	HALB-I340	Y
4	HALB-I360	Y
5	HALB-I400	N
6	HALB-I450	N
7	HALB-I500	N
8	HALB-IPB300	N
9	HALB-IPB320	N
10	HALB-IPB340	Y
11	HALB-IPB360	Y
12	HALB-IPB400	Y
13	HALB-IPB450	Y
14	HALB-IPB500	Y

3.7 Managing Sections: Point to the catalog using the PRM resource for SFD/SDD

11. Change the Standard in the PRM file: Open the PRM, switch the standard from AISC to DIN.
12. Point to the Str. Specifications catalog you created in the previous steps. E.g.

```
<!-- ************** Structure Standards **************
     <Resource Name="StructureStandards" Description="P
   <ID  Type="Misc" Driver="File" Location="AISC"/>
     </Resource>
```

11

```
<!-- ************** Structure Standards ***********
     <Resource Name="StructureStandards" Descriptic
   <ID  Type="Misc" Driver="File" Location="DIN"/>
     </Resource>
```

```
 Specification Catalog ************** -->
ureSpecificationsCatalog" Description="Structure Specifications Catalog" Visible="yes">
.ver="File" Location="${Components_Directory}\StructuralCatalogs\Materials\StructureSpecifications.catalog"/>
```

12

```
 Specification Catalog ************** -->
:eSpecificationsCatalog" Description="Structure Specifications Catalog" Visible="yes">
/er="File" Location="D:\V5R16Dev\prjapa16_str_pc\intel_a\startup\components\StructuralCatalogs\Materials\STR_DIN_SpecificationsCatalog
```

New R16

13. Save your PRM file.

3.7 Managing Sections: Catalog management for the resolved sections for SFD/SDD:

Restart Catia.

13. The PRM that you modified should point to the updated standard and catalog.

New R16

StructureDetailDesignCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\EquipmentAndSystems\Structure\DetailingFeatures\DetailingFeatures.catalog
StructureSpecificationsCatalog	D:\V5R16Dev\prjapa16_str_pc\intel_a\startup\components\StructuralCatalogs\Materials\STR_DIN_SpecificationsCatalog.catalog
StructureThicknessCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\components\StructuralCatalogs\Materials\StructureThickness.catalog
NamingSectionCharacteristics	CATStrSectionNamingKeys
OrientNamingConvFileName	CATStrOrientNamingUSAConv
StructureSectionsCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\components\StructuralCatalogs\AISC\AISC_Resolved.catalog
StructureMarginSizeList	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\EquipmentAndSystems\Structure\Tables\MarginTables\MarginSizeListSample.txt
StructureThicknessList	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\components\StructuralCatalogs\ThicknessTables\ThicknessListSample.txt
StructureOpeningsCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\components\StructuralCatalogs\OPENINGS\SFD_Openings_BigScale.catalog
StructureMaterialsCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\components\StructuralCatalogs\Materials\StructureMaterials.CATMaterial
StructureDetailDesignOpeningCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\EquipmentAndSystems\StructureDetailDesign\FeatureCatalogs\Parametric\Ope...
SddDesignTemplatesCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\EquipmentAndSystems\StructureDetailDesign\FeatureCatalogs\Parametric\Desi...
StructureDrawingSymbolsCatalog	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\components\StructuralCatalogs\DrawingSymbols\Structure2DSymbols-Cust.cat...
ProjectParameters	R:\A_to_Z Structure\STR_CVI_ENV\ProjectParameters\ProjectParameters.xml
MoldedConventions	R:\A_to_Z Structure\STR_CVI_ENV\Molded Conventions\SFDLiteMoldedConventions.xml
ProjectReferencePlanes	R:\A_to_Z Structure\STR_CVI_ENV\Planes\ReferencePlanesSystem.xml
StructureHullModel	R:\A_to_Z Structure\STR_CVI_ENV\Hull\HullCVI.CATPart
StructureHullFeatureName	HULL001
StructureFunctionalDesignMappingClass	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\EquipmentAndSystems\StructureFunctionalDesign\DataDictionary\StructureFun...
ProjectEnvelope	R:\A_to_Z Structure\STR_CVI_ENV\Envelope\CATShipProjectEnvelope.xml
StructureStandards	DIN
CompAccessPlateGenerationOptions	\\na001dsa\cxr2dsa\prjapa16_pc\intel_a\startup\EquipmentAndSystems\CompartmentAccess\CompartmentAccessDesign\Sampl

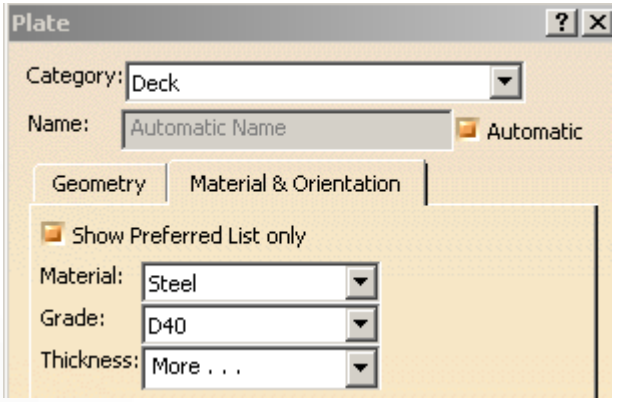
13

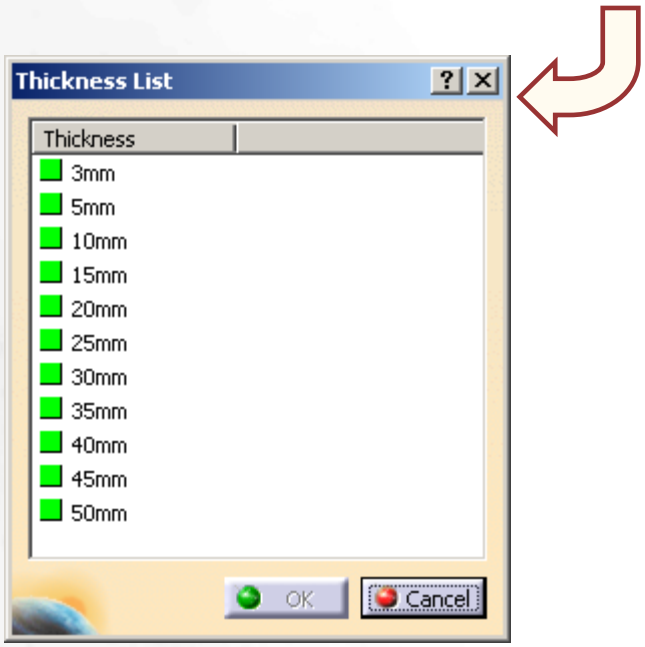
3.8 Managing Sections: Catalog management for the resolved sections for SFD/SDD:

New R16

Restart Catia.

14. Place a Deck: The material thicknesses are displayed.

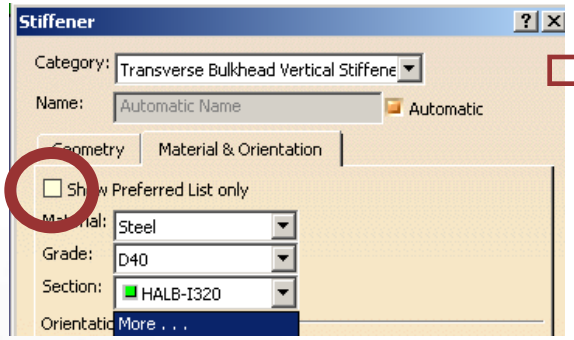


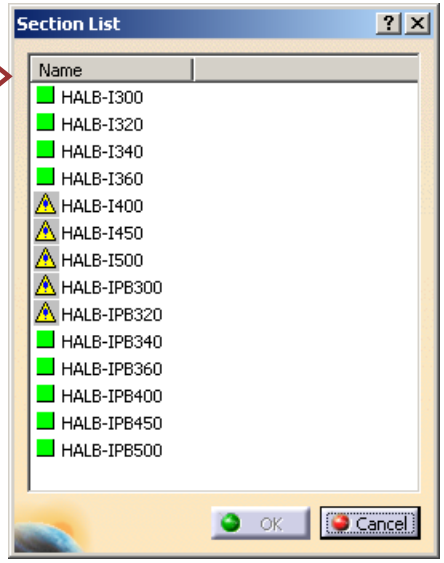


3.8 Managing Sections: Place the custom section into a design document.

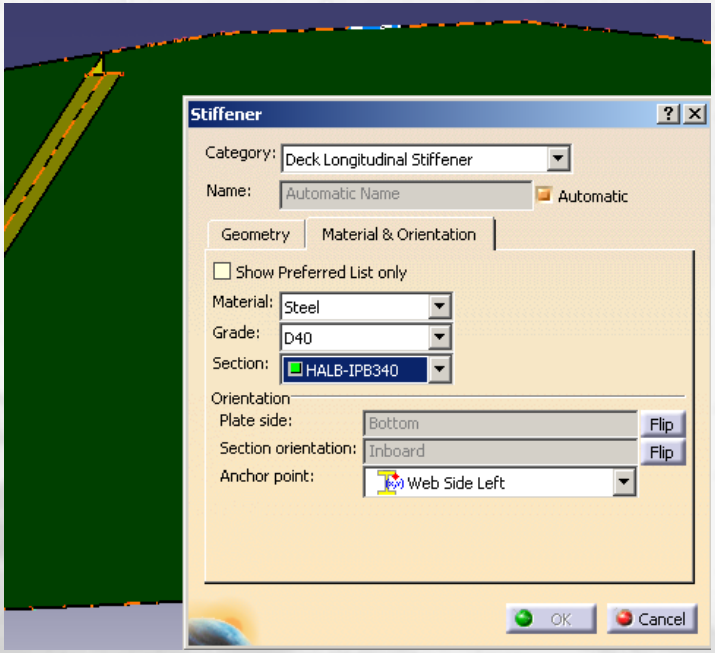
15. Place a Stiffener: The material thicknesses are displayed and the Sections that you have created as displayed.

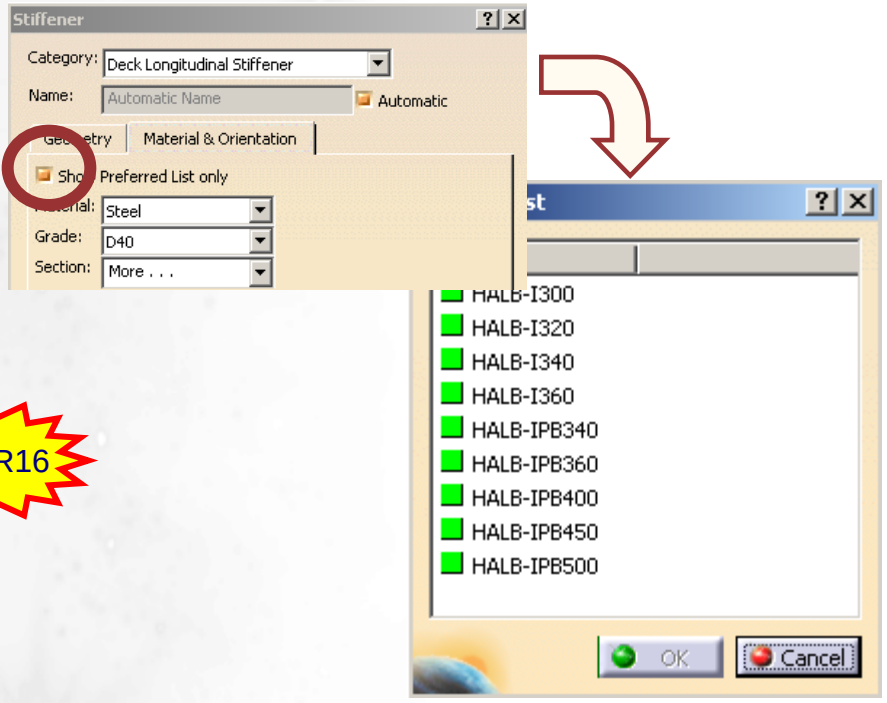
- Note the difference between the sections with the Spec Mode keyword flagged as ‘Y’ Green) vs. ‘N’ (Caution icon).





Preferred List Display





New R16

3.9 Managing Sections: Management of the Preferred List via PRM

New R16

- Management of the “Preferred List” in PRM. The PRM resource: MaterialManagementMode is used to manage the preferred list.

```
<!-- ***** Material Grade Preferred List mode - None, ActiveUnSpec, ActiveSpec  ***** -->
 <Resource Name="MaterialManagementMode" Visible="yes">
    <ID  Type="Misc" Driver="File" Location="ActiveUnSpec"/>
 </Resource>
```

The possible entries for this resource are : “ActiveUnSpec”, “ActiveSpec” and “” (Blank).

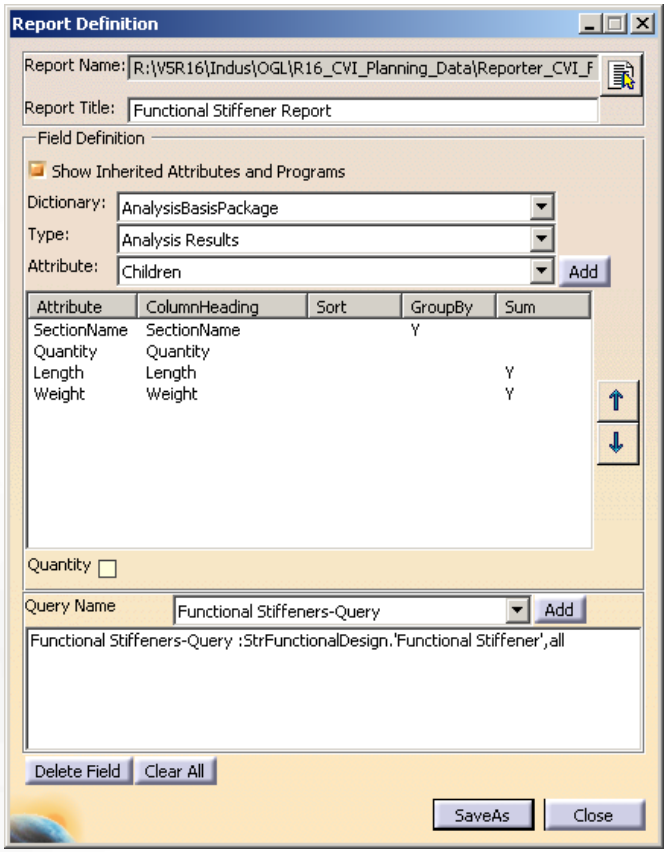
ActiveUnSpec: This means that the preferred list mode is not enabled by default. The entries shown in the panel are both preferred and non-preferred values. The user can click on the check box to temporarily override the option and then only preferred entries are shown. However when the user exits the command and re-enters, then the mode is unchecked. The mode is not stored in the CATSettings.

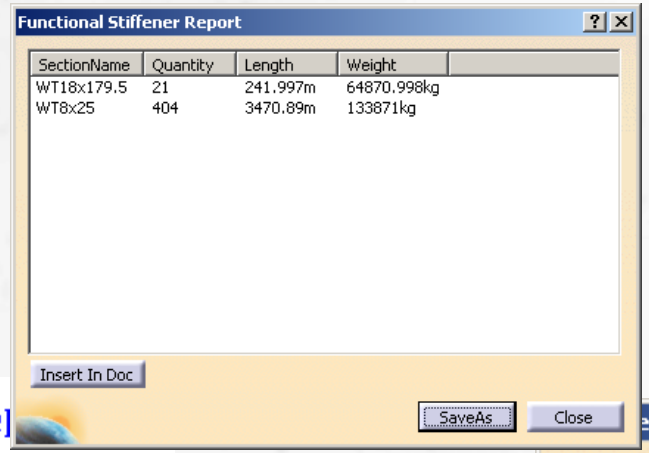
ActiveSpec: This means that the preferred list mode is enabled by default. The entries shown in the panel are only preferred values. The user can click on the check box to temporarily override the option and then both preferred and non-preferred entries are shown. However when the user exits the command and re-enters, then the mode is checked. The mode is not stored in the CATSettings.

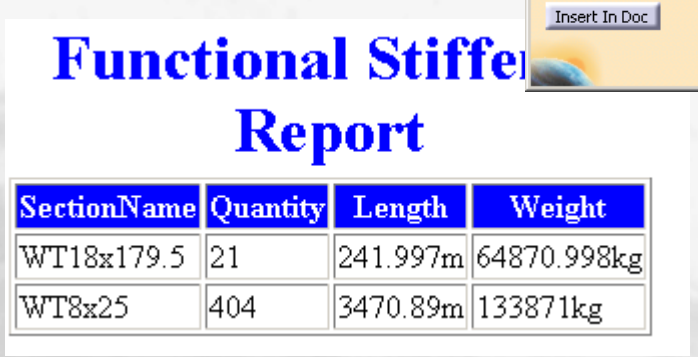
“” (Blank): This means that the user intends to read the mode from the CATSettings file. In this case, when the user overrides the mode and leaves the command and re-enters it, it remains set to the previous one.

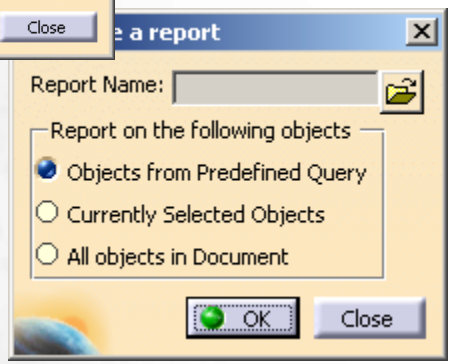
4. Reporter: Report Definition and Execution

- **Execution of customized reports based on the attributes defined in the Feature Dictionary.**
- **Administrators can define customized queries.**
- **Calculation of weight based on material type and section length.**
- **Save reports as excel files, html files, txt files.**





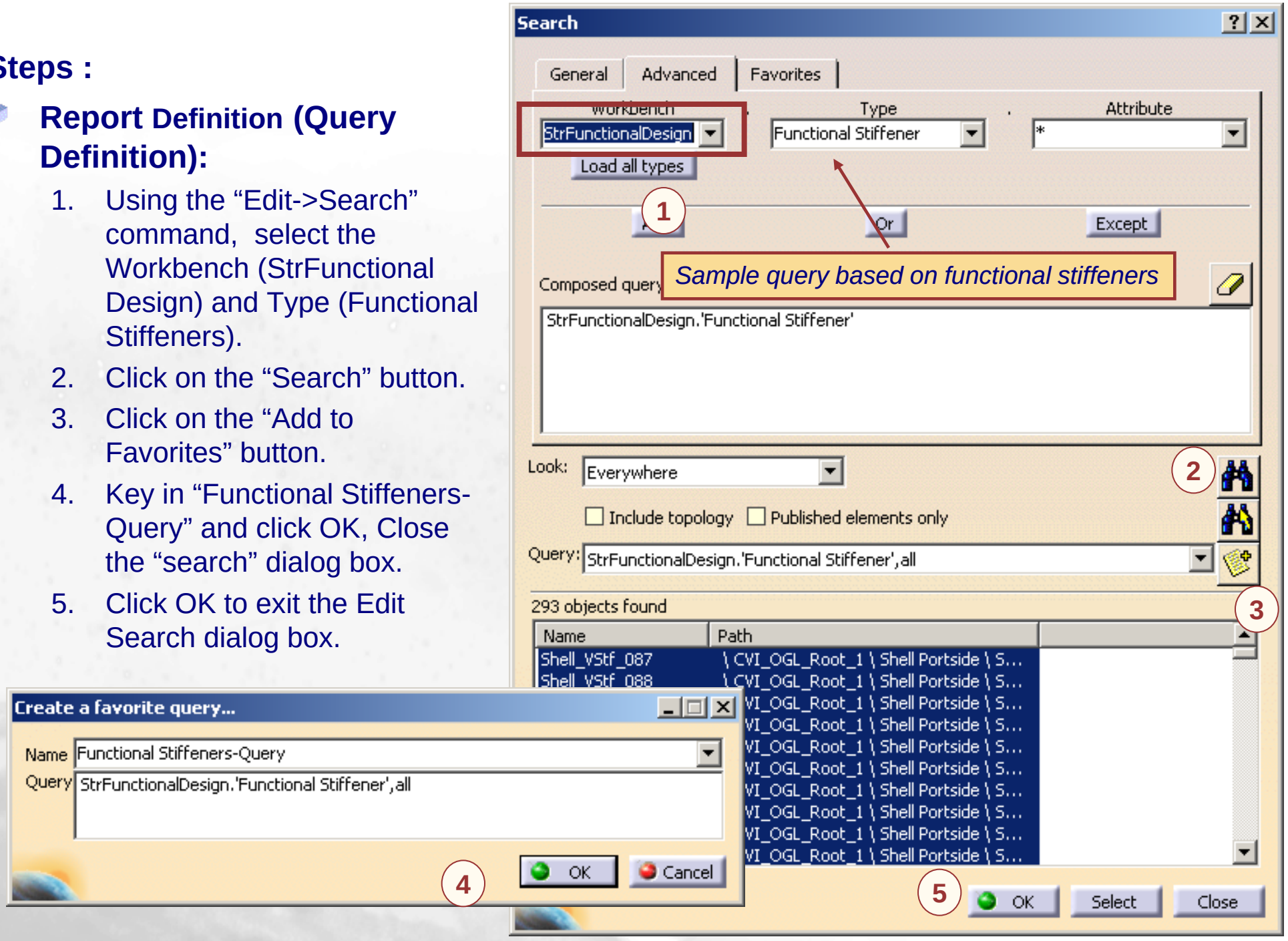




4.1 Reporter: Defining a Query

Steps :

- **Report Definition (Query Definition):**
  1. Using the “Edit->Search” command, select the Workbench (StrFunctional Design) and Type (Functional Stiffeners).
  2. Click on the “Search” button.
  3. Click on the “Add to Favorites” button.
  4. Key in “Functional Stiffeners-Query” and click OK, Close the “search” dialog box.
  5. Click OK to exit the Edit Search dialog box.

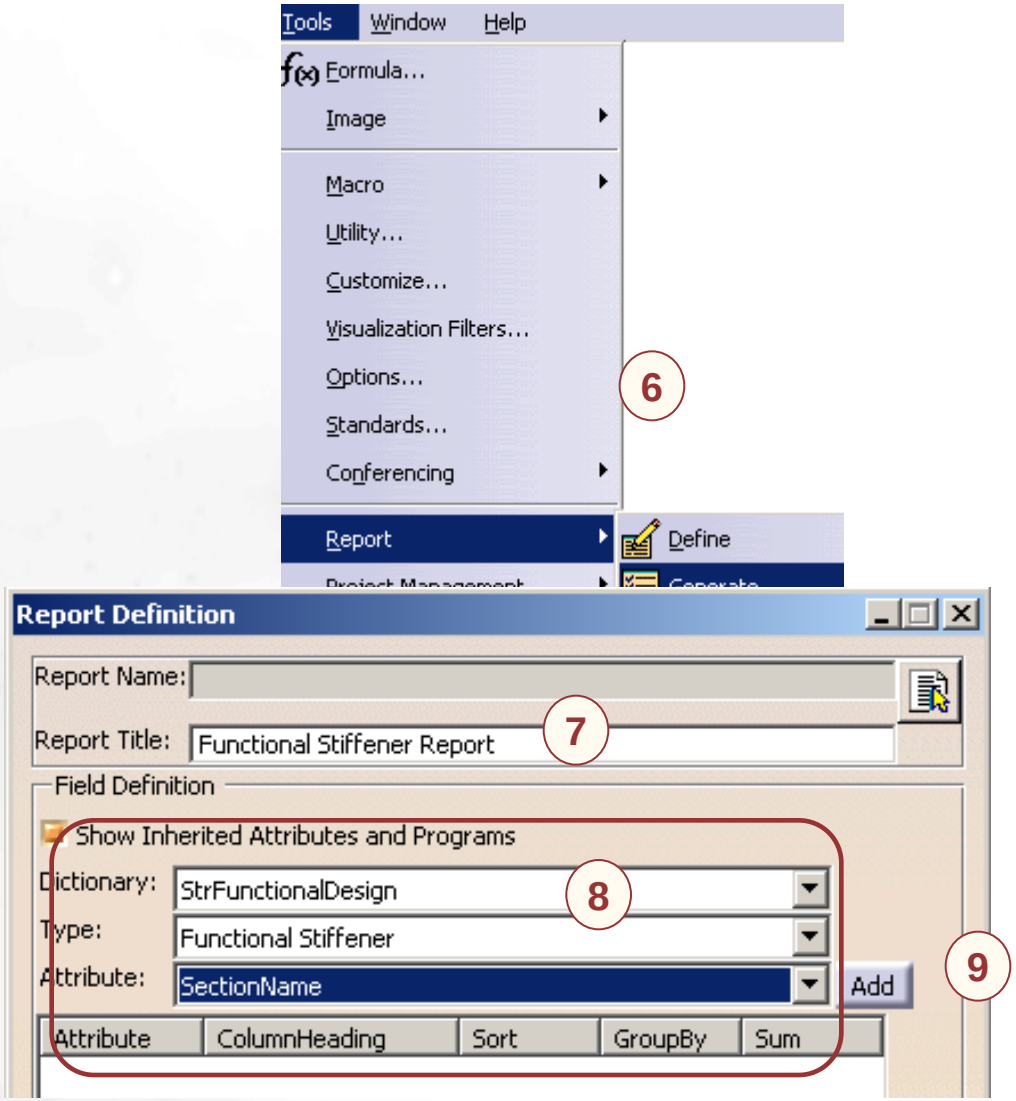


4.1 Reporter: Report Definition (2)

Steps:

- **Report Definition :**
  6. Select the Tools -> “Report Define” command. The “Report Definition” dialog box is displayed
  7. Key in the Report Title: Functional Stiffener Report
  8. Select the appropriate entries:
     1. Dictionary: StrFunctionalDesign
     2. Type: Functional Stiffener
     3. Attribute: Section Name
  9. Click “Add” in the Attribute Row.

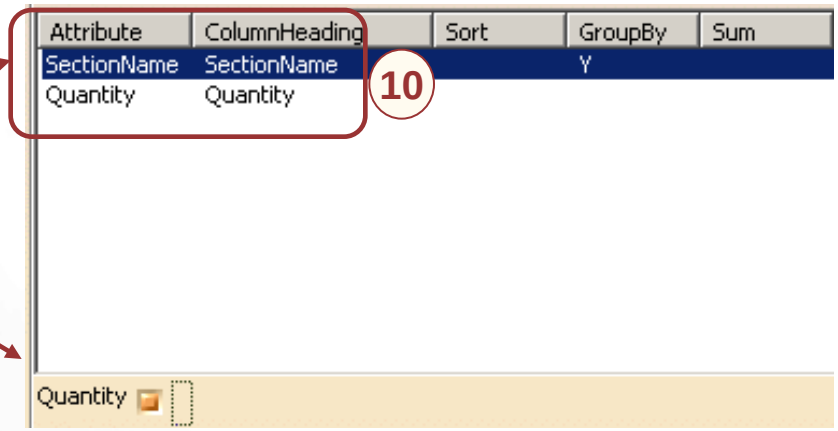
For this exercise, we will create a simple reporter for a List of functional stiffeners based upon the section type. . The report will include the Length, Weight and quantity.

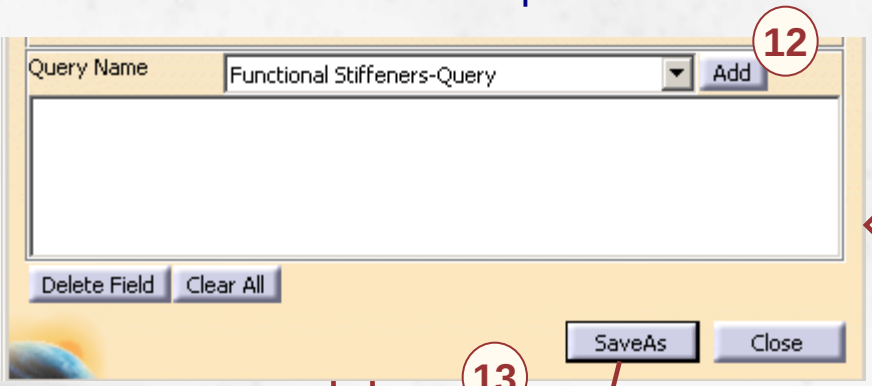


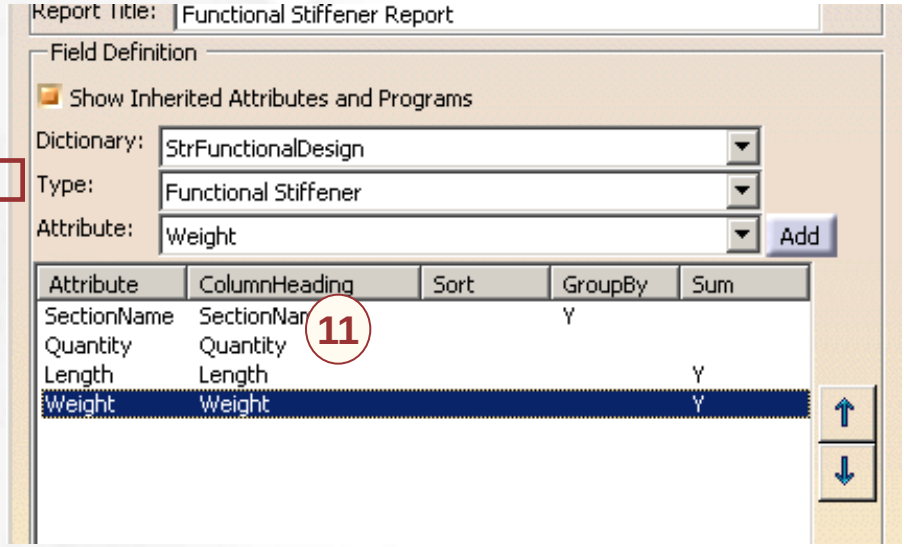
4.1 Reporter: Report Definition (3)

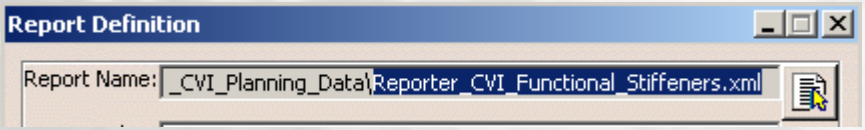
Steps (cont):

- **Report Definition :**
  10. Click in the “GroupBy” field and select the “Quantity” button. This allows you to report the quantity of each type of section.
  11. Add the Length and weight Attributes and click on the “sum” fields.
  12. Add the query that you defined using the Edit Search command.
  13. Save the Report file.







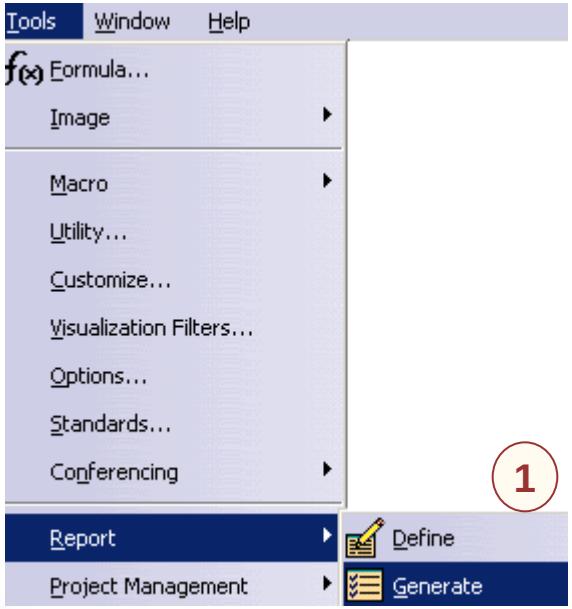


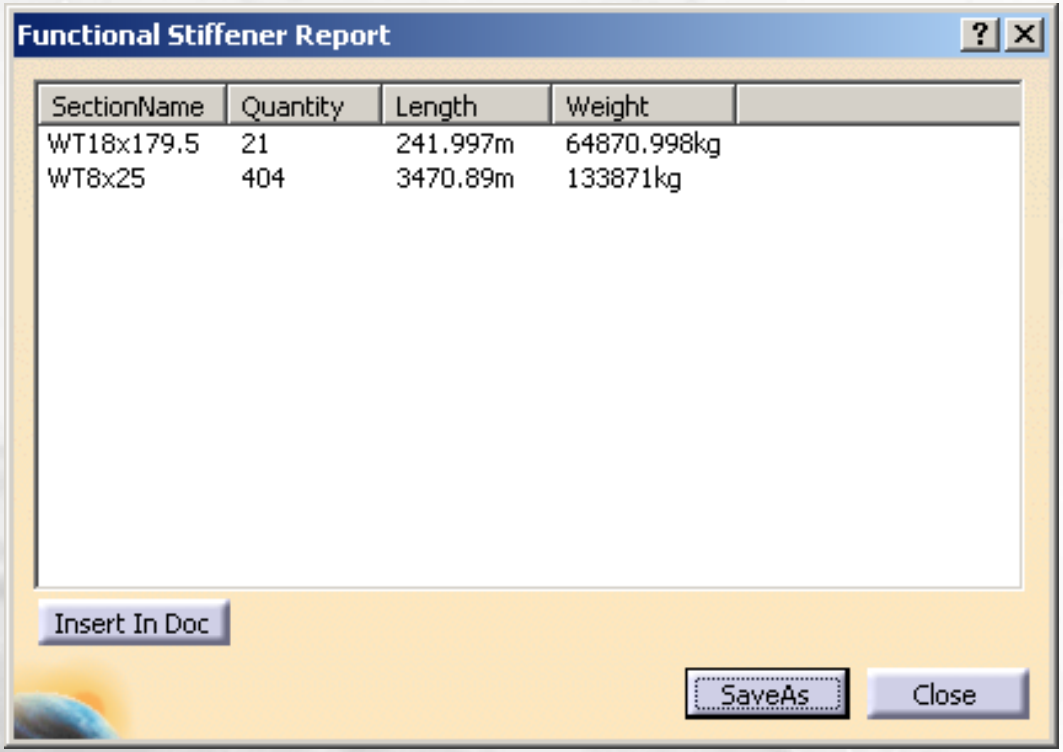
4.2 Report Generation (1 of 2)

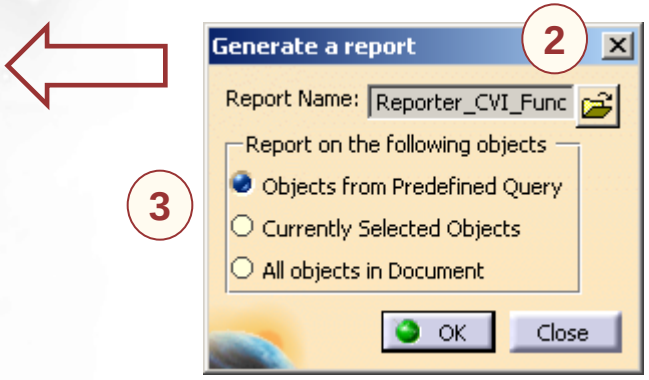
Steps:

- **Report Generation:**

1. Select the “Report Generation” command from Tools command
2. Select the reporter that you have created in the previous steps.
3. Using the option “Objects from Predefined Query”, click OK. The report preview is displayed.



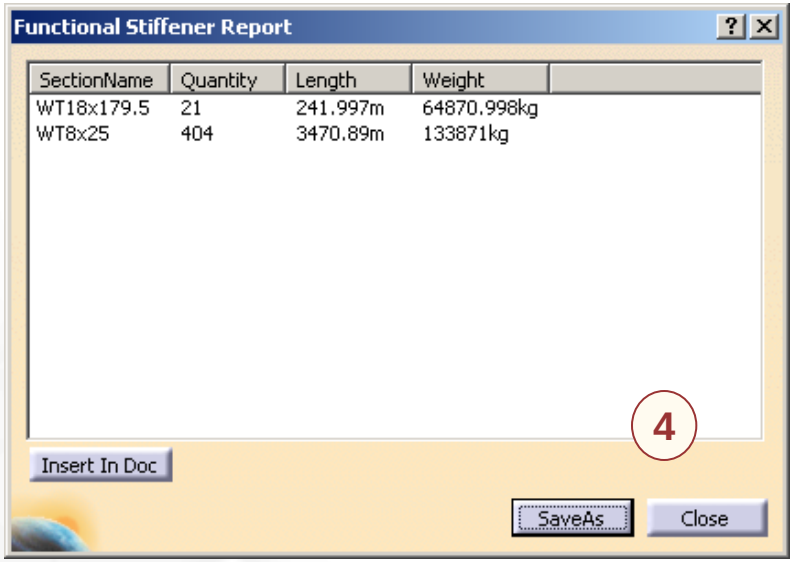




4.2 Reporter: Report Generation (2 of 2)

Steps (cont):

- **Report Generation:**
  4. You can also use the “Save As” option and save the report as a file of html, txt,csv, xml, xls format or insert the report into an existing 2D Document. We will save the report as an HTML file and open it using the browser. Use the “SaveAs” button to save the report as an htm file.
  5. Using the browser (e.g. Internet Explorer), open the output file.



5

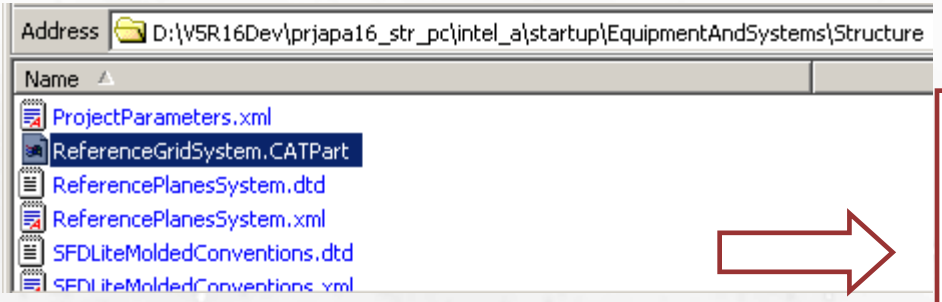
Functional Stiffener Report

SectionName	Quantity	Length	Weight
WT18x179.5	21	241.997m	64870.998kg
WT8x25	404	3470.89m	133871kg

5.1 Definition of Project Plane Systems - Overview

New R16

The project plane systems that are common to the project will be defined in the **ReferencePlanesSystem.xml** file. By default this file contains Plane Systems with planes named LONG, DECK and CROSS. Planes defined in this xml would appear under Project data whenever a new functional system is created.



Reference Planes XML

```
<?xml version="1.0" encoding="windows-1252"?>
<!DOCTYPE ReferencePlanesSystem SYSTEM "ReferencePlanesSystem.dtd">

<ReferencePlanesSystem>

   <GeometricData LengthUnit="mm">

     <PlaneSystem Name ="DECK">

         <Origin  X = "0"      Y = "0"    Z = "0"  />

         <Primary_Attribute   RED="0"   BLUE="0"   GREEN="255" Thk="0.1" />

         <Secondary_Attribute RED="0"   BLUE="255" GREEN="255" Thk="0.1"/>

         <Direction  X = "0"   Y = "0"    Z = "1" />

         <Definition>
          <!-- Note: Do not use plus sign ("+") for the Name's value.(e.g.
              <Plane  Name ="DECK.0" TYPE="PRIMARY" OFFSET = "0"     />
              <Plane  Name ="DECK.1" TYPE="PRIMARY" OFFSET = "5000"  />
              <Plane  Name ="DECK.2" TYPE="PRIMARY" OFFSET = "10000" />
              <Plane  Name ="DECK.3" TYPE="PRIMARY" OFFSET = "19000" />
              <Plane  Name ="DECK.4" TYPE="PRIMARY" OFFSET = "20000" />
              <Plane  Name ="DECK.5" TYPE="PRIMARY" OFFSET = "25000" />
              <Plane  Name ="DECK.6" TYPE="PRIMARY" OFFSET = "30000" />
              <Plane  Name ="DECK.7" TYPE="PRIMARY" OFFSET = "35000" />
              <Plane  Name ="DECK.8" TYPE="PRIMARY" OFFSET = "40000" />
              <Plane  Name ="DECK.9" TYPE="PRIMARY" OFFSET = "45000" />
```

The following changes can be made to the project planes:

1. The offset values for the planes can be modified.
2. New planes can be added e.g, DECK.10, DECK.11 etc.
3. Name of the sub-system e.g DECK can be modified
4. Names of the planes e.g, DECK.1, DECK.2,....etc can be modified.

5.2 Plane system hierarchy within a system - Overview

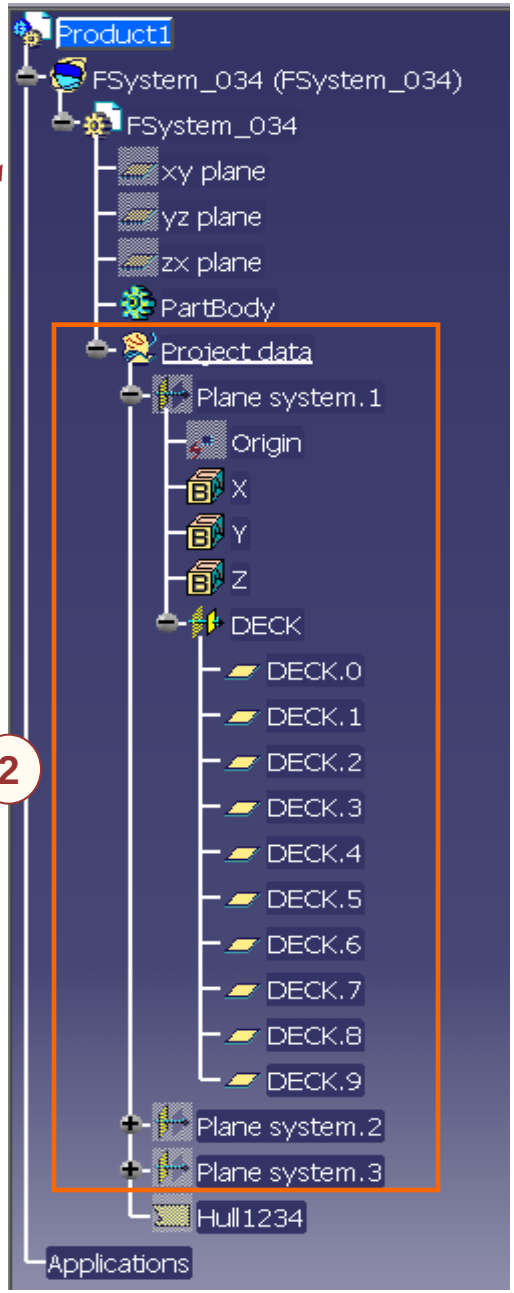
New R16

1. Once the administrator defines the Project planes in the reference planes XML file, the end users can create a Structure Functional System from the Structure Functional System Design workbench.
2. Notice all the planes defined in the reference planes XML are now seen inside the Project data.
3. Make sure you point to the correct resource in the PRM file for the Plane Systems before creating a functional system..

NOTE: Creation of plane systems is an administrator task

Plane Systems defined in this XML file are seen inside the Project data under each Structure Functional System and Structure Detail CATPart(s).

NOTE: Minimum of three plane systems are required



3 Project XML file

```
<!-- ************** Project Reference Planes *********** -->
  <Resource Name="ProjectReferencePlanes" Description="Defines the reference planes definition" Visible="yes">
     <ID  Type="Path" Driver="File" Location="${Startup_Directory}\Structure\ReferencePlanesSystem.xml"/>
  </Resource>
```

5.3 Plane System Definition - Exercise

New R16

1. Open the ReferencePlanesSystem.xml file and perform the modifications shown below:

Located in ... \intel_a\startup\EquipmentAndSystems\Structure

Original XML

```
<Definition>
 <!-- Note: Do not use plus sign ("+") for the Name's value.(e.g.
      <Plane  Name ="DECK.0"    TYPE="PRIMARY" OFFSET = "0"     />
      <Plane  Name ="Tank.Top" TYPE="PRIMARY" OFFSET = "1770" />
      <Plane  Name ="DECK.1"    TYPE="PRIMARY" OFFSET = "3000"  />
      <Plane  Name ="DECK.2"    TYPE="PRIMARY" OFFSET = "6000"  />
      <Plane  Name ="DECK.3"    TYPE="PRIMARY" OFFSET = "9000"  />
      <Plane  Name ="DECK.4"    TYPE="PRIMARY" OFFSET = "12000" />
      <Plane  Name ="DECK.5"    TYPE="PRIMARY" OFFSET = "14000" />
```

NOTE: This task should be performed before beginning your project.

Modified XML

1

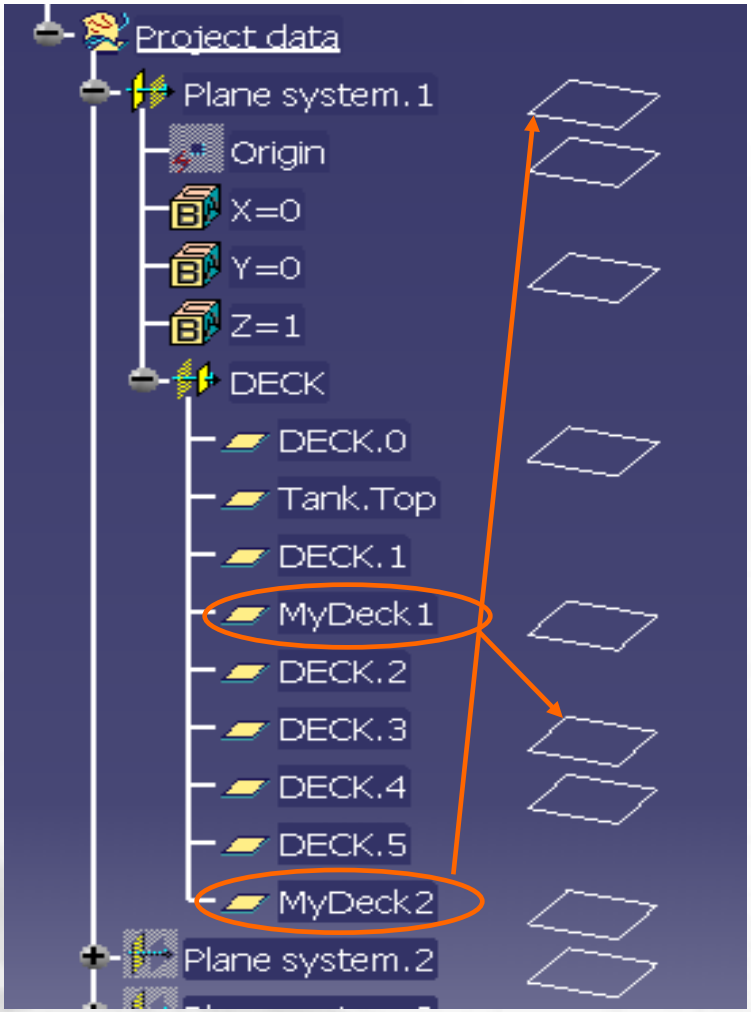
```
<Definition>
 <!-- Note: Do not use plus sign ("+") for the Name's value.(e.g. use
      <Plane  Name ="DECK.0"    TYPE="PRIMARY" OFFSET = "0" />
      <Plane  Name ="Tank.Top" TYPE="PRIMARY" OFFSET = "1000" />
      <Plane  Name ="DECK.1"    TYPE="PRIMARY" OFFSET = "3000"  />
      <Plane  Name ="MyDeck1"    TYPE="PRIMARY" OFFSET = "4000" />
      <Plane  Name ="DECK.2"    TYPE="PRIMARY" OFFSET = "6000"  />
      <Plane  Name ="DECK.3"    TYPE="PRIMARY" OFFSET = "9000"  />
      <Plane  Name ="DECK.4"    TYPE="PRIMARY" OFFSET = "12000" />
      <Plane  Name ="DECK.5"    TYPE="PRIMARY" OFFSET = "14000" />
      <Plane  Name ="MyDeck2"    TYPE="PRIMARY" OFFSET = "15000" />
```

Add these two new plane definitions. Plane names can be any e.g MyDeck1 and MyDeck2.

5.3 Plane System Defined in XML: Exercise ...continued

New R16

2. After Modifying save and close the Reference Plane XML.
   Now in Structure Functional Design workbench create a Functional System.



Notice the new planes that were defined in the XML appear in the design document and in Specification tree.

5.4 Plane System Synchronization - Overview

New R16

Plane system synchronization refers to updating the planes in the 3D whenever Reference plane XML undergoes changes. When these changes are made in the middle of the design process, the synchronize plane command will update the planes as well as all the structural objects that are affected by the new plane system definition. The Synchronize Plane Systems command supports the following changes.

1. **Plane Name change**

   Change of name of any plane in the XML. Make sure that you have the write access on the XML. Now save and close the XML. In the CATIA session right click on the project data inside the Function System Part and click on the Plane System synchronization option. Notice that the new name of the plane would be seen in the specification tree.

   Limitation: The changes to the sub-system names e.g DECK, CROSS, LONG won't be synchronized. Synchronization only works with the name changes of planes e.g Deck.1, Long.1 etc

2. **Plane Offset value change**

   Change the offset value of any plane or planes. As above repeat the plane synchronization step. Notice that the plane would move to respect the new offset value in the XML. Any structural object if defined on this plane would also move to follow the plane.

3. **Addition of new planes**

   Addition of new planes in the Reference Planes XML as discussed in section 5.3 can be synchronized using the "Synchronize Planes System".

These changes are shown pictorially in the next slide.

5.5 Changes supported for Plane Synchronization

New R16

1. The names of the planes can be modified. Now on existing Functional Systems choose “Synchronize Planes” option so that the name changes are applied. New Functional Systems will automatically assume the new plane names.

2 The shown offset value changes can be synchronized. Just make sure that the changes follow the ascending order. For example, you should not change 10000 for Deck.2 in this example to 4000. It should have an offset value between 5000 and 19000.

The planes defined here are in ABSOLUTE not RELATIVE

```
<ReferencePlanesSystem>

   <GeometricData LengthUnit="mm">

     <PlaneSystem Name ="DECK">

          <Origin  X = "0"      Y = "0"    Z = "0"  />

          <Primary_Attribute   RED="0"   BLUE="0"   GREEN="255" Thk="0.1" />

          <Secondary_Attribute RED="0"   BLUE="255" GREEN="255" Thk="0.1"/>

          <Direction  X = "0"   Y = "0"    Z = "1" />

          <Definition>
           <!-- Note: Do not use plus sign ("+") for the Name's value.(e.g. use DECK.1 not DECK.+1) -->
               <Plane  Name ="DECK.0" TYPE="PRIMARY" OFFSET = "0"     />
               <Plane  Name ="DECK.1" TYPE="PRIMARY" OFFSET = "5000"  />
               <Plane  Name ="DECK.2" TYPE="PRIMARY" OFFSET = "10000" />
               <Plane  Name ="DECK.3" TYPE="PRIMARY" OFFSET = "19000" />
               <Plane  Name ="DECK.4" TYPE="PRIMARY" OFFSET = "20000" />
               <Plane  Name ="DECK.5" TYPE="PRIMARY" OFFSET = "25000" />
               <Plane  Name ="DECK.6" TYPE="PRIMARY" OFFSET = "30000" />
               <Plane  Name ="DECK.7" TYPE="PRIMARY" OFFSET = "35000" />
               <Plane  Name ="DECK.8" TYPE="PRIMARY" OFFSET = "40000" />
               <Plane  Name ="DECK.9" TYPE="PRIMARY" OFFSET = "45000" />

          </Definition>
```

1 2 3

3. To define a new plane, a complete row should be added as shown. Make sure that the offset value for this plane follow the ascending order.

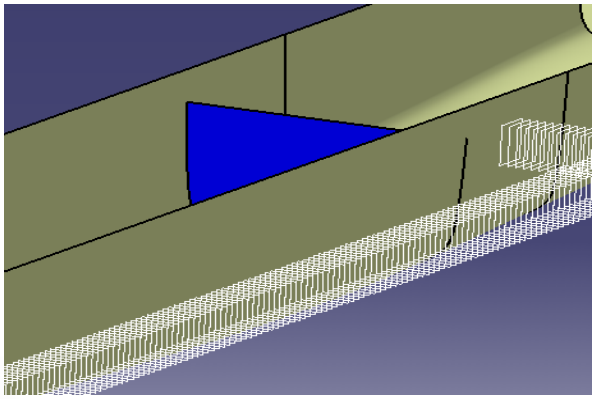
5.6 Plane System Synchronization: Exercise

New R16

Steps:

1. Create a Structure Functional System. In this system create a Transversal Bulkhead on a CROSS plane e.g, CROSS.64. Limit it using the Hull and a DECK plane e.g DECK.3. \
2. Place Transversal Bulkhead Vertical Stiffeners as shown on right side. For support use planes LONG.10, LONG.12, LONG.14, LONG.16.
3. Open the ReferencePlanesSystem.xml file and enable write access. Do the following modifications to this xml as shown below:

With Original XML 1



Original XML

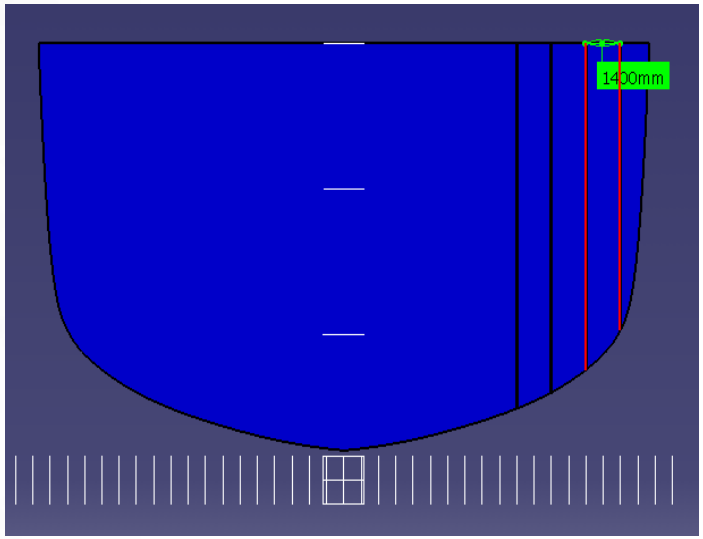
```
<Plane Name ="LONG.10"   TYPE="PRIMARY" OFFSET =   "+7000"  />
<Plane Name ="LONG.11"   TYPE="PRIMARY" OFFSET =   "+7700"  />
<Plane Name ="LONG.12"   TYPE="PRIMARY" OFFSET =   "+8400"  />
<Plane Name ="LONG.13"   TYPE="PRIMARY" OFFSET =   "+9100"  />
<Plane Name ="LONG.14"   TYPE="PRIMARY" OFFSET =   "+9800"  />
<Plane Name ="LONG.15"   TYPE="PRIMARY" OFFSET =   "+10500" />
<Plane Name ="LONG.16"   TYPE="PRIMARY" OFFSET =   "+11200" />
```

Modify the offset values

2

Modified XML 3

```
<Plane Name ="LONG.10"   TYPE="PRIMARY" OFFSET =   "+7500"  />
<Plane Name ="LONG.11"   TYPE="PRIMARY" OFFSET =   "+8500"  />
<Plane Name ="LONG.12"   TYPE="PRIMARY" OFFSET =   "+9500"  />
<Plane Name ="LONG.13"   TYPE="PRIMARY" OFFSET =   "+10500"  />
<Plane Name ="LONG.14"   TYPE="PRIMARY" OFFSET =   "11500"  />
<Plane Name ="LONG.15"   TYPE="PRIMARY" OFFSET =   "+12500" />
<Plane Name ="LONG.16"   TYPE="PRIMARY" OFFSET =   "+13500" />
<Plane Name ="LONG.17"   TYPE="PRIMARY" OFFSET =   "+14500" />
<Plane Name ="LONG.18"   TYPE="PRIMARY" OFFSET =   "+15000" />
<Plane Name ="LONG.19"   TYPE="PRIMARY" OFFSET =   "+16500" />
```

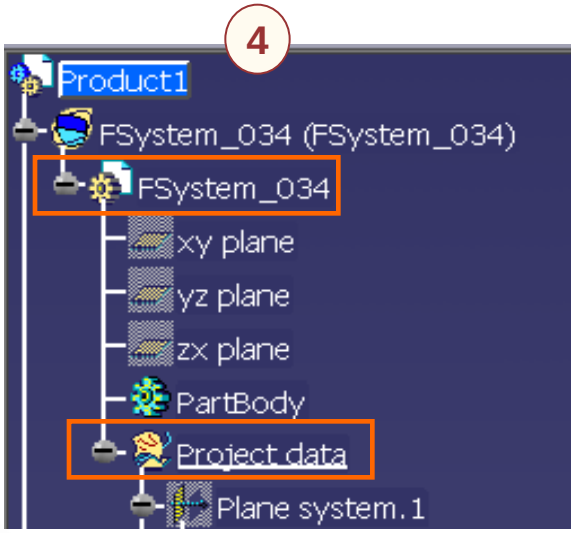


4. After Modifying save the Reference Plane XML.

5.6 Plane System Synchronization: Exercise ...continued

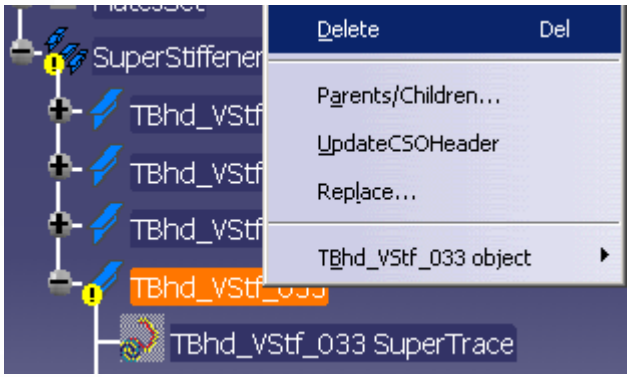
New R16

4. Activate the Part level and Invoke Structure Functional Object Design workbench.
Right-click on the Project Data and select “Synchronize the Planes” command.



5. The following error message will be generated. This is because the planes that no more coincide with the Bulkhead due to a change in their offset values can no longer be used as supports for placing the stiffeners. Click OK.

6. Notice the planes move to their new offset locations. Stiffener TBhd_VStf_33 whose plane is out of bounds is seen in red. Delete this stiffener manually.



5.7 Hull CATPart: New Resource in PRM

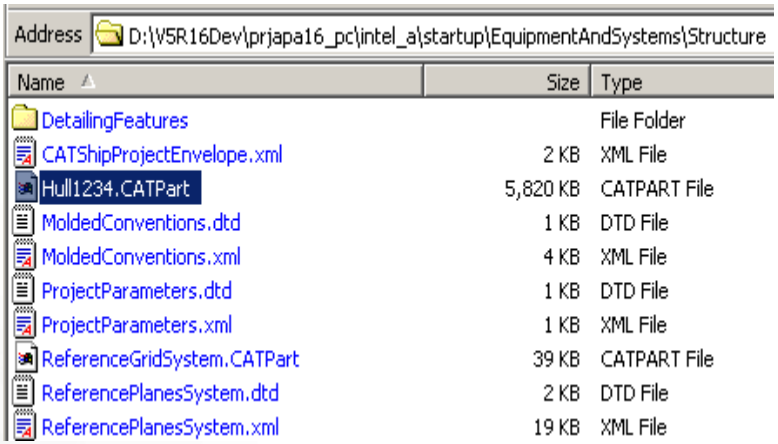
New R16

The default Hull CATPart is also a new resource pointed to by the PRM. By default it is named Hull1234.CATPart. This resource is seen under each Structural System.

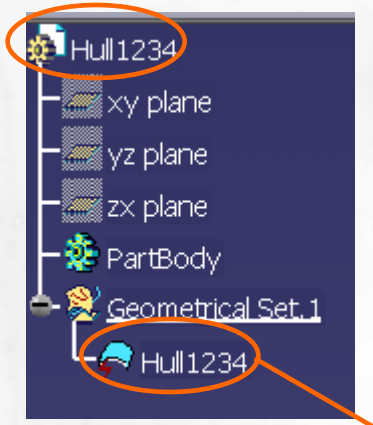
1. Location of the default Hull1234.CATPart
2. Open the Hull1234.CATPart. Notice the Hull1234 feature inside the Geometrical Set.1
3. Upon creation of a Functional System this Hull feature is copied under the Project data.

Before starting working make sure that the PRM file points to the correct Hull feature. Check the name and the location of the resources.

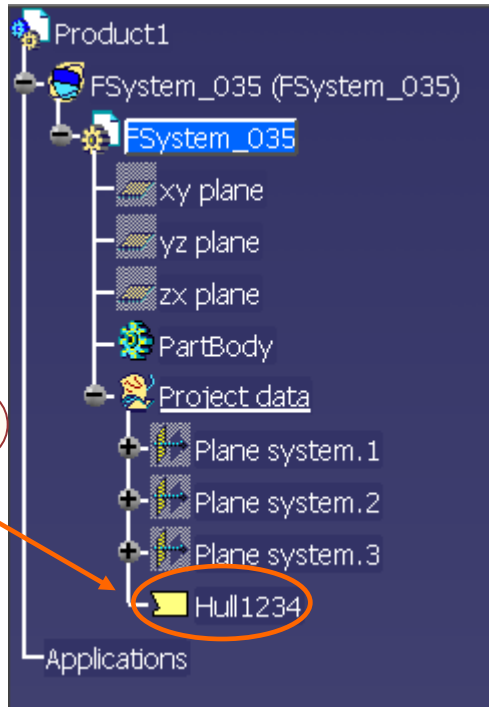
1



2



3




```
<!-- ***** System Hull Model  ***** -->
  <Resource Name="StructureHullModel" Description="The Hull model used for structure functional and detail de
     <ID Type="Catia" Driver="File" Location="$(Startup_Directory)\Structure\Hull1234.CATPart" Access="R" />
  </Resource>

<!-- ***** System Hull Feature Name  ***** -->
  <Resource Name="StructureHullFeatureName" Visible="yes">
     <ID  Type="Misc" Driver="File" Location="Hull1234"/>
  </Resource>
```

Hull CATPart

Hull Feature

5.8 Hull Synchronization: Overview

New R16

Hull Synchronization refers to updating the design document once the Hull definition changes during the design process. Hull definition change could be any of the following.

Administrator could make several changes to the Hull resource, e.g:

Case1: Use a new HullCVI.CATPart and point to it in the PRM.
Case2: Same Hull1234.CATPart and same feature Hull1234 names with a different geometry.
Case3: Same Hull1234.CATPart but different feature name and geometry.

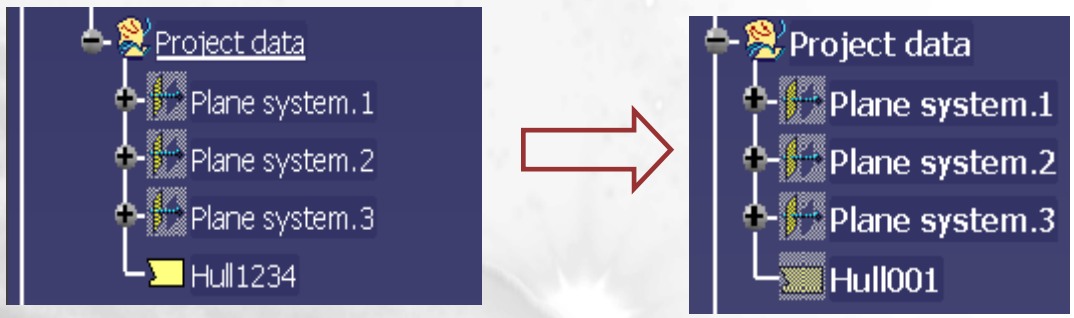
Case 1:

```
<!-- ***** System Hull Model  ***** -->
  <Resource Name="StructureHullModel" Description="The Hull model used for structure functional and detail des
     <ID Type="Catia" Driver="File" Location="${Startup_Directory}\Structure\HullCVI.CATPart" Access="R" />
  </Resource>

<!-- ***** System Hull Feature Name  ***** -->
  <Resource Name="StructureHullFeatureName" Visible="yes">
     <ID  Type="Misc" Driver="File" Location="Hull001"/>
  </Resource>
```

Before: Hull1234

Before: Hull1234.CATPart

Note: Make sure this new Hull is present at the location to which PRM points. Also change the Midship and centerline location values in the ProjectParameters.xml to match the new Hull.



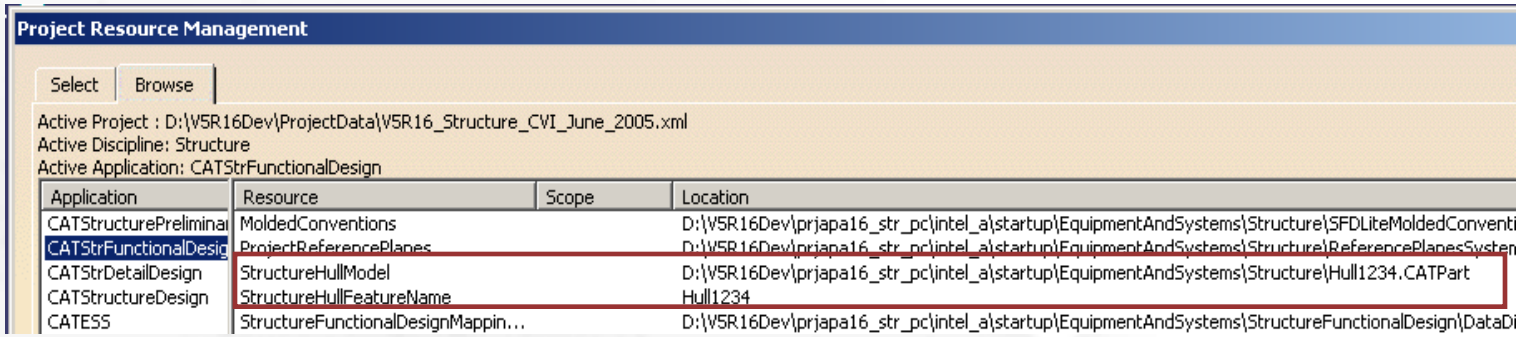
5.9 Hull Synchronization: Exercise continued...

New R16

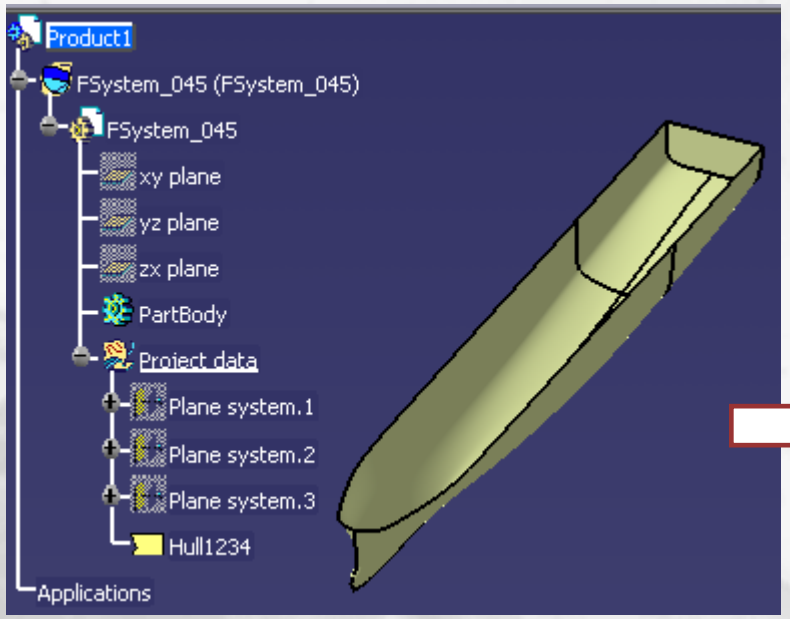
Exercise Case 1:

1. Check the PRM to point to resources Hull1234.CATPart and to feature Hull1234
2. Create a Structural Functional System. The default Hull1234 feature will be copied under the Project Data.
3. Create two Transversal Bulkheads on any two different cross planes e.g, CROSS.30 and CROSS.60. Limit it by Hull1234 feature and DECK.2 planes.

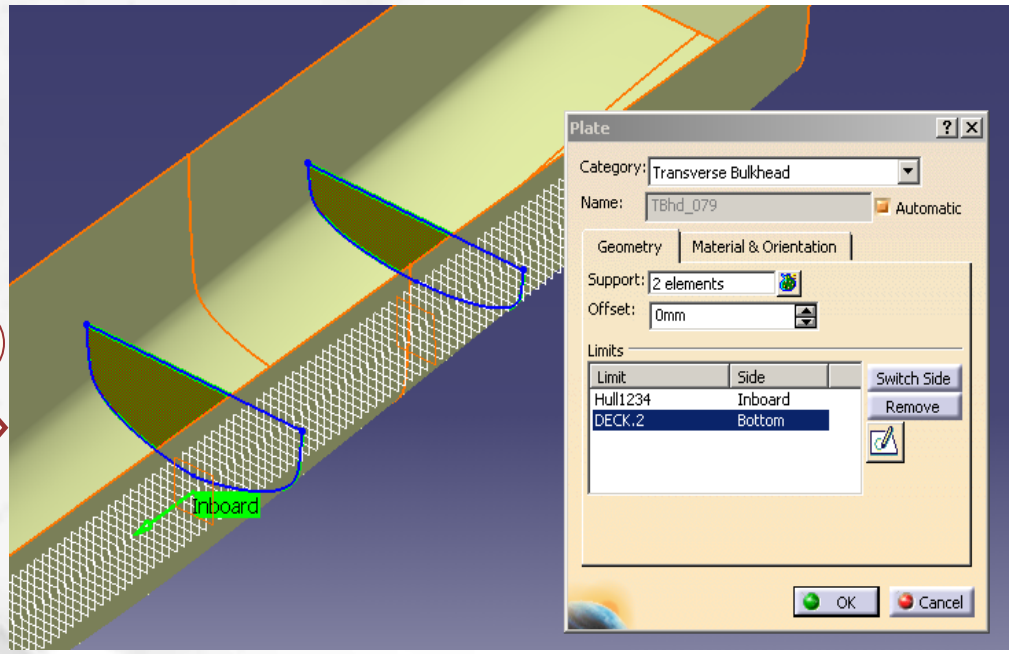
1



2



3



5.9 Hull Synchronization: Exercise continued...

New R16

Exercise Case 1: ...continued

4. Point to a new Hull and Hull Feature in the PRM e.g, change Hull1234.CATPart to HullCVI.CATPart and from Hull1234 to Hull001 feature in the project XML file.
5. Save changes to PRM. Do “Save Management” on the design document and close CATIA session. Restart CATIA session and open the saved document.

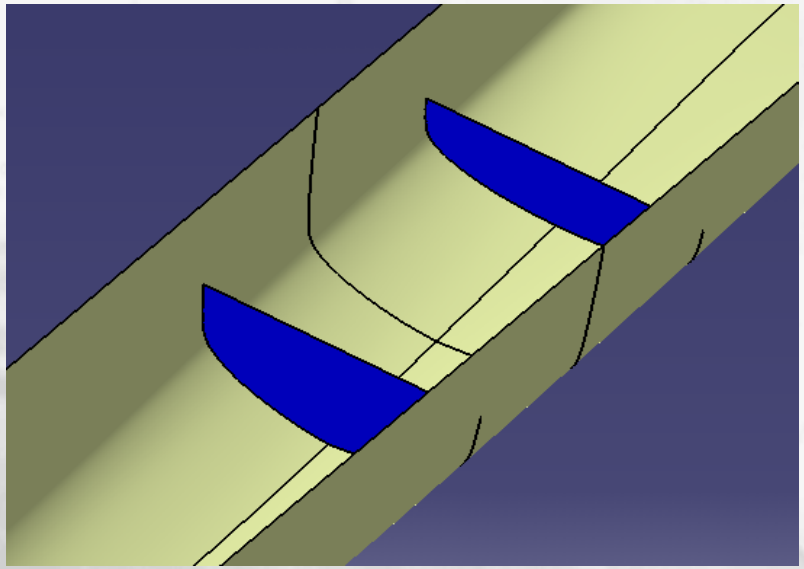
PRM:

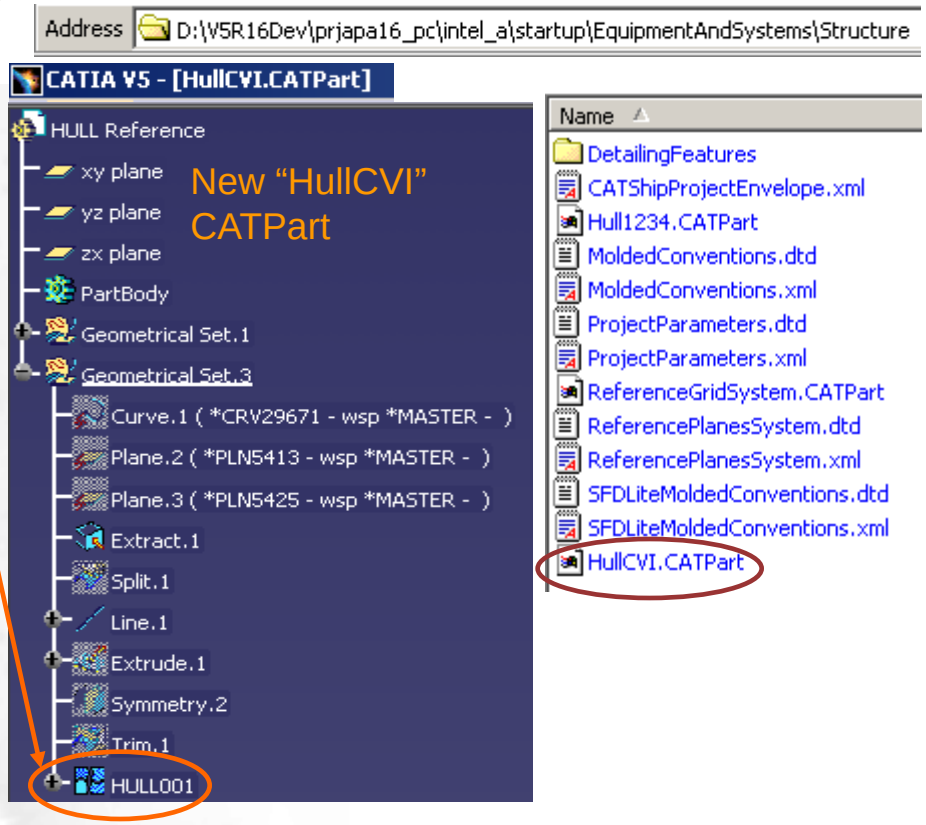
4

```
<!-- ***** System Hull Model  ***** -->
  <Resource Name="StructureHullModel" Description="The Hull model used for structure functional and detail c
     <ID Type="Catia" Driver="File" Location="${Startup_Directory}\Structure\HullCVI.CATPart" Access="R" />
  </Resource>

<!-- ***** System Hull Feature Name  ***** -->
  <Resource Name="StructureHullFeatureName" Visible="yes">
     <ID  Type="Misc" Driver="File" Location="HULL001"/>
  </Resource>
```

Note: Make sure that the new Hull that you point to in the PRM is also present in the location specified.

5



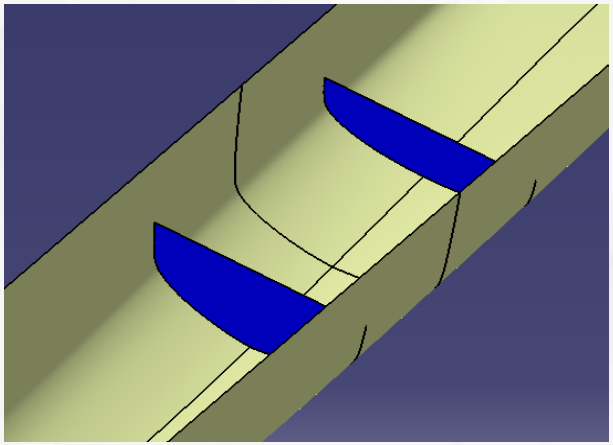


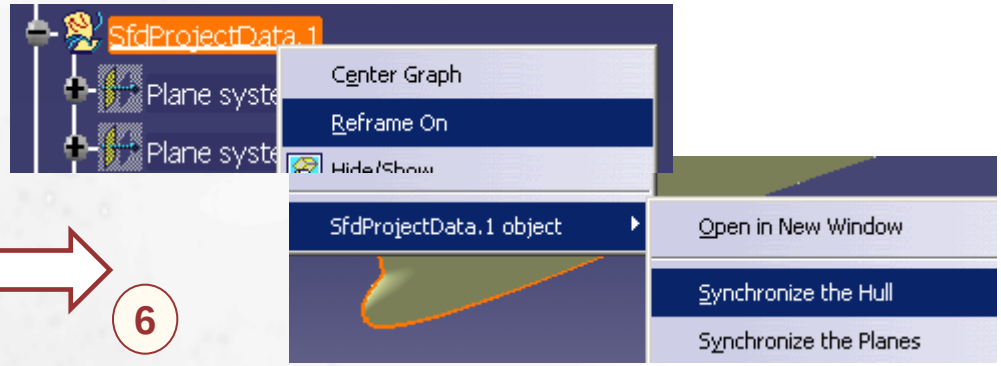
5.9 Hull Synchronization: Exercise continued...

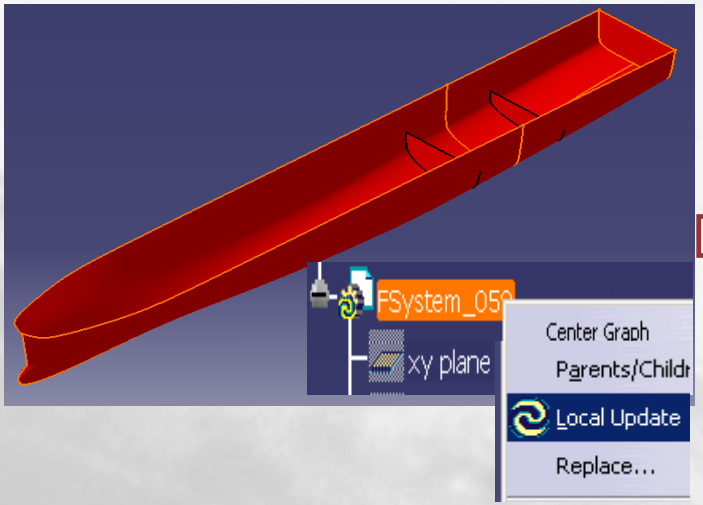
New R16

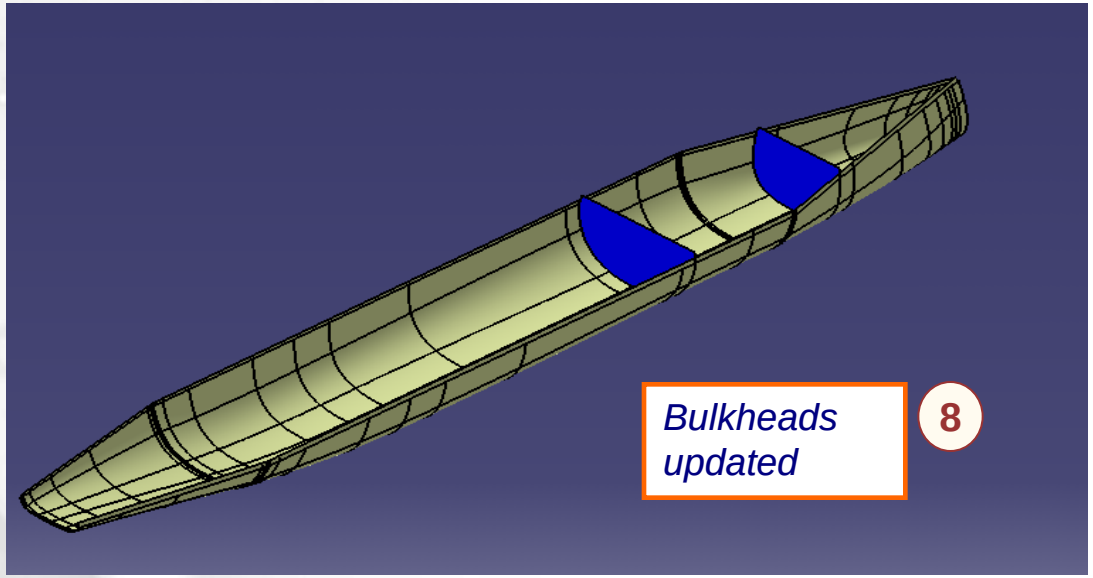
Exercise Case 1:...continued

6. Activate the Part level and right-click on SfdProjectData. Select the “Synchronize the Hull” command.
7. Right-click on Structure Functional System CATPart and select “Local Update”.
8. Notice the Bulkheads update for the new Hull









6.1 Define EndCut using UDF technology

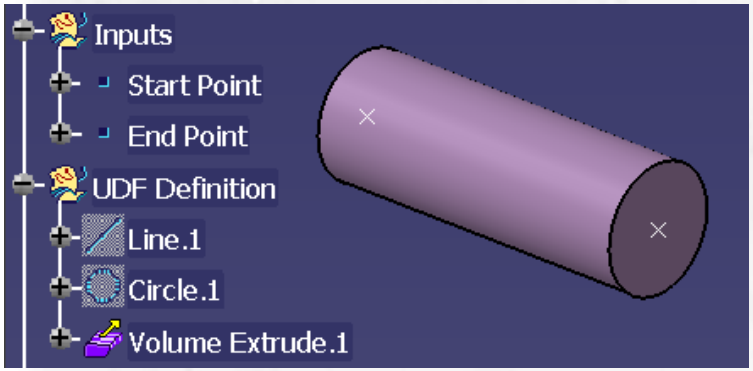
New R16

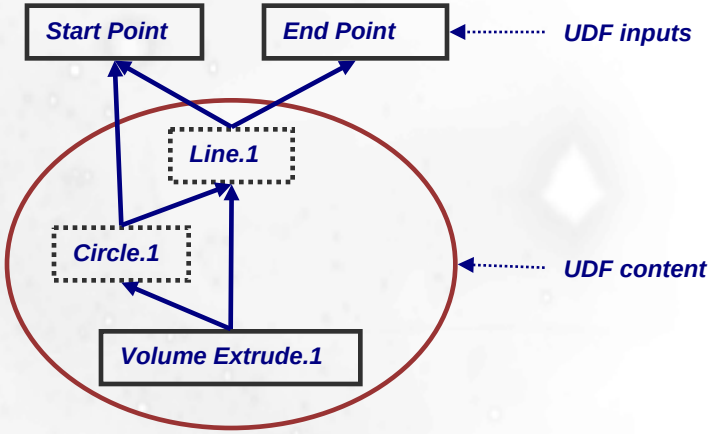
To define a new EndCut, the administrator has to create a UDF and add it in the catalog of detailing features.
The end user will then be able to place it in its design using a dedicated contextual menu in the stiffener command.

Simple description of "User Define Feature" concept:

Defining a UDF is a way to group a set of features so that they are seen as only one feature. This new feature can then be reused in new contexts.

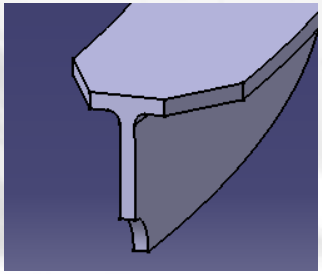
Example: I want to create a new type of object: the cylinder between two points.

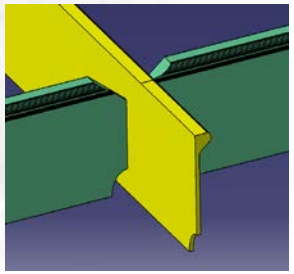


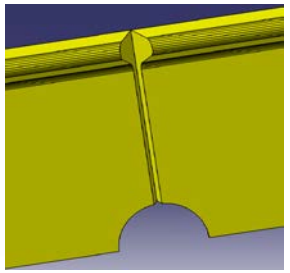


Inputs of a UDF
are deduced from its content

EndCuts are UDF with the following characteristics:
1- The result of the UDF must be a volume. (This volume will be removed from the profile to display the proper result)
2- The inputs of the UDF (characteristic edges/faces of a profile) have to follow a particular naming convention to be automatically retrieved when placing the endcut.





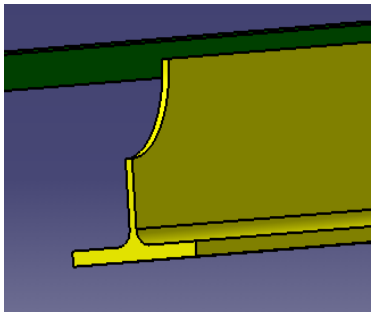


6.1 Define EndCut using UDF technology ...continued

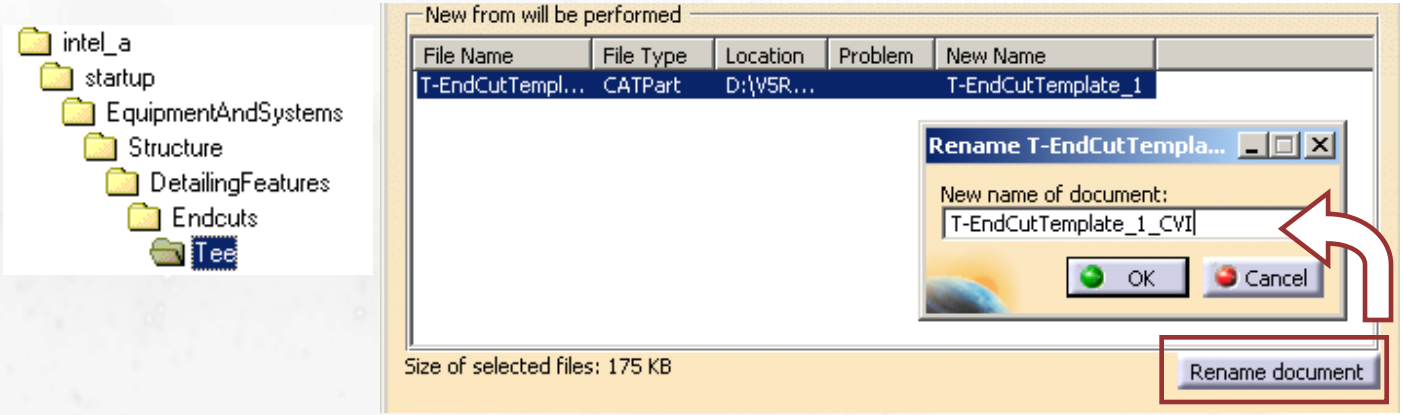
New R16

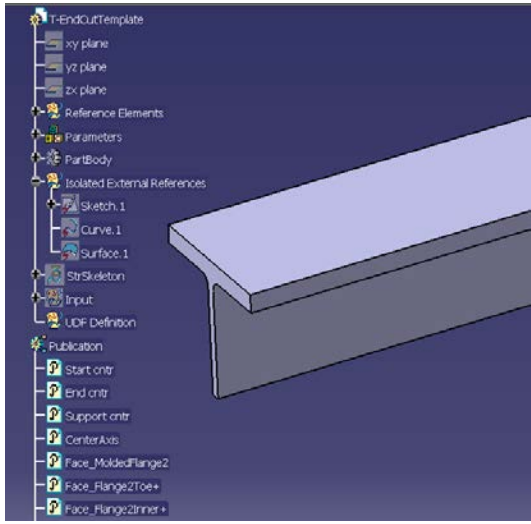
We will start from a sample CATPart which contains a profile

We want to create this Endcut on a stiffener:



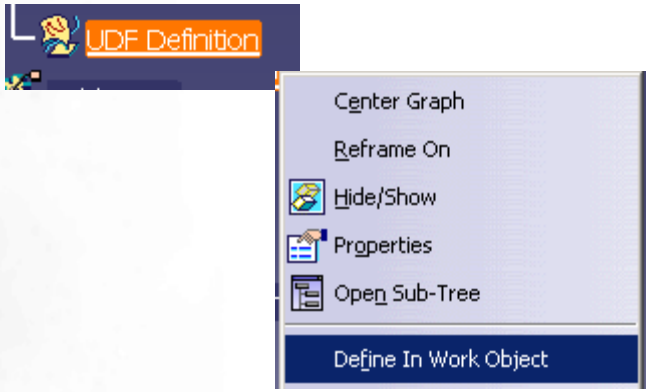
1. File → New from intel_a\ ...\Tee\T-EndCutTemplate.CATPart + Rename document





2. File → Save

3. Right-click on UDF definition feature from the tree and select "Define In Work Object". We will now define the geometry required for the UDF Definition.

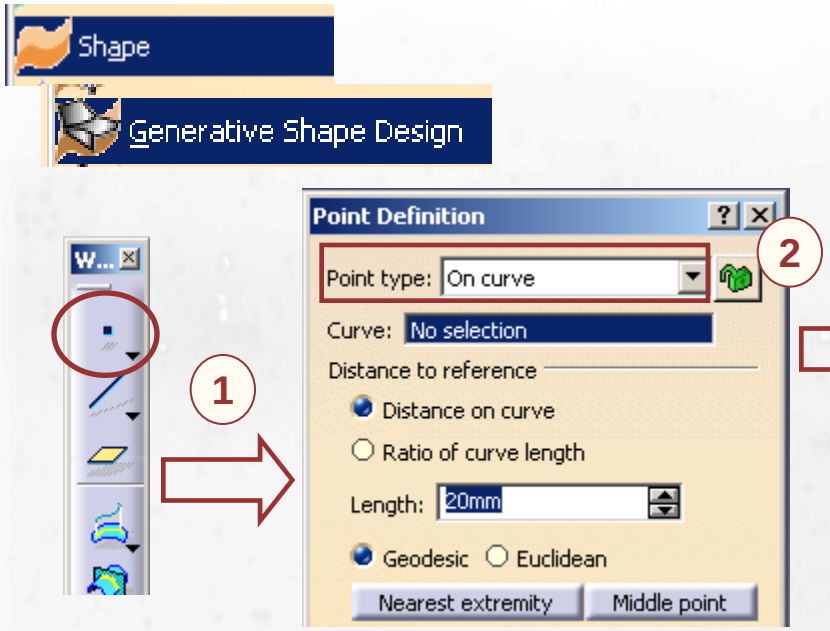


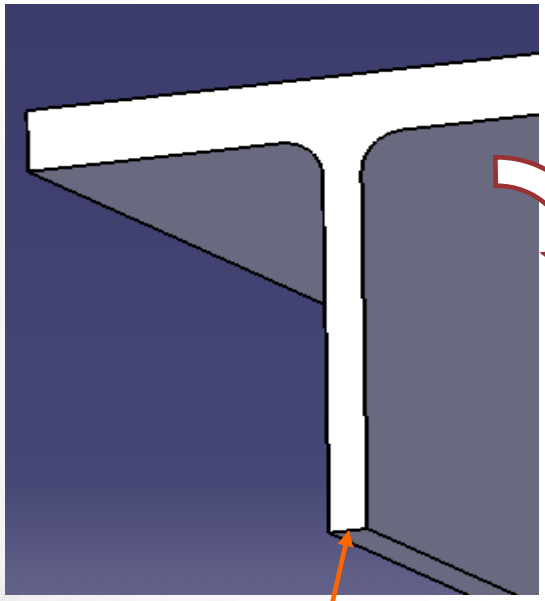
NOTE: In the next slide we will define UDF features: Point, Plane, Circle, Extruded Volume

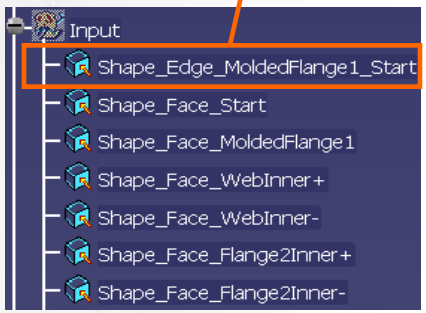
6.1 Define EndCut using UDF technology ...continued

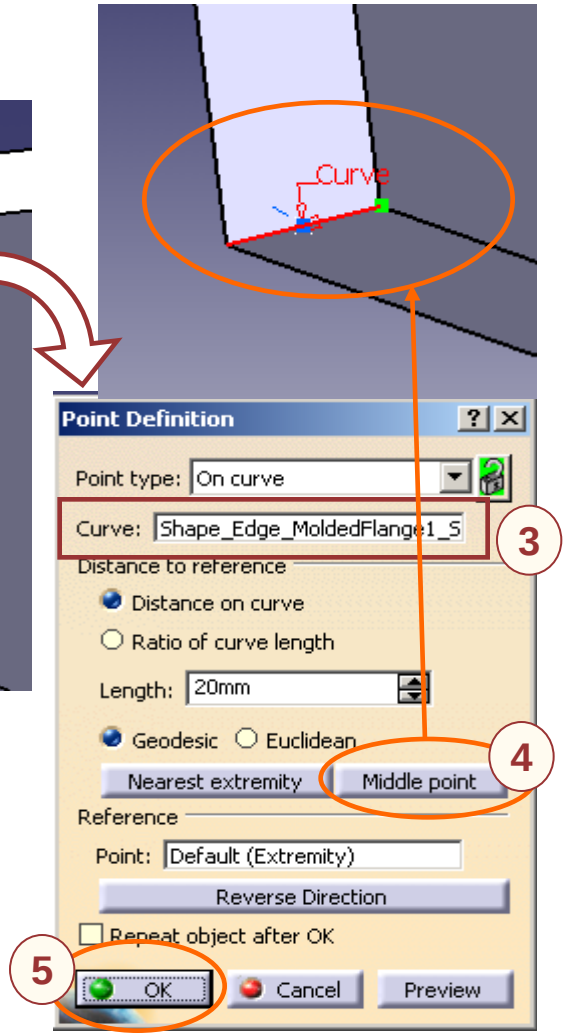
New R16

Point Definition: Under the currently activated "UDF Definition" GeometricalSet, create a point at the middle of MoldedFlange1 start edge by following the steps below:



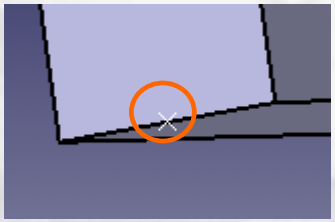






1. Click on the GSD point command
2. For "Point type" field select "On Curve".
3. For the "Curve" field select Shape_Edge_MoldedFlange1_Start from "Input" Geometrical set.
4. Select "Middle Point" option
5. Click OK

Result →

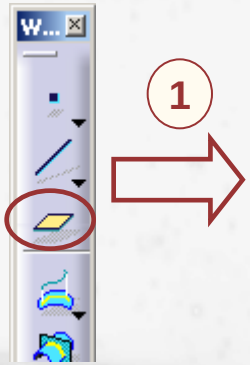


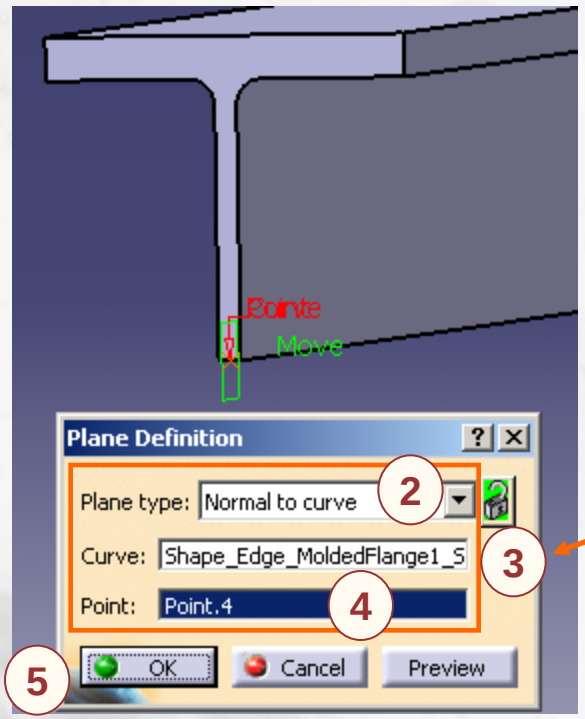
6.1 Define EndCut using UDF technology ...continued

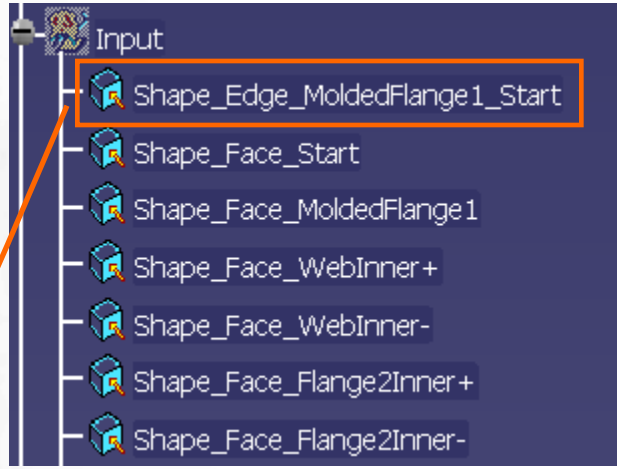
New R16

Plane Definition: Under the currently activated “UDF Definition” GeometricalSet, create a Plane normal to MoldedFlange1 start edge passing through the previously created point.

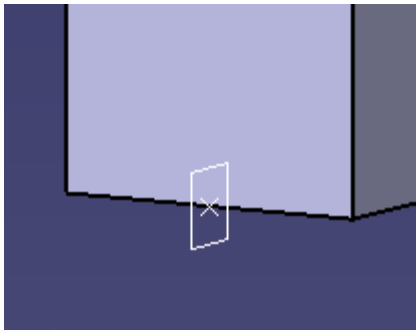
1. Select the GSD “Plane” command.
2. For the “Plane Type” field choose “Normal to Curve”
3. For the “Curve” field choose the “Shape_Edge_MoldedFlange1_Start” from the GeometricalSet named “Input”.
4. For the “Point” field choose previously created point.
5. Click OK







Result →

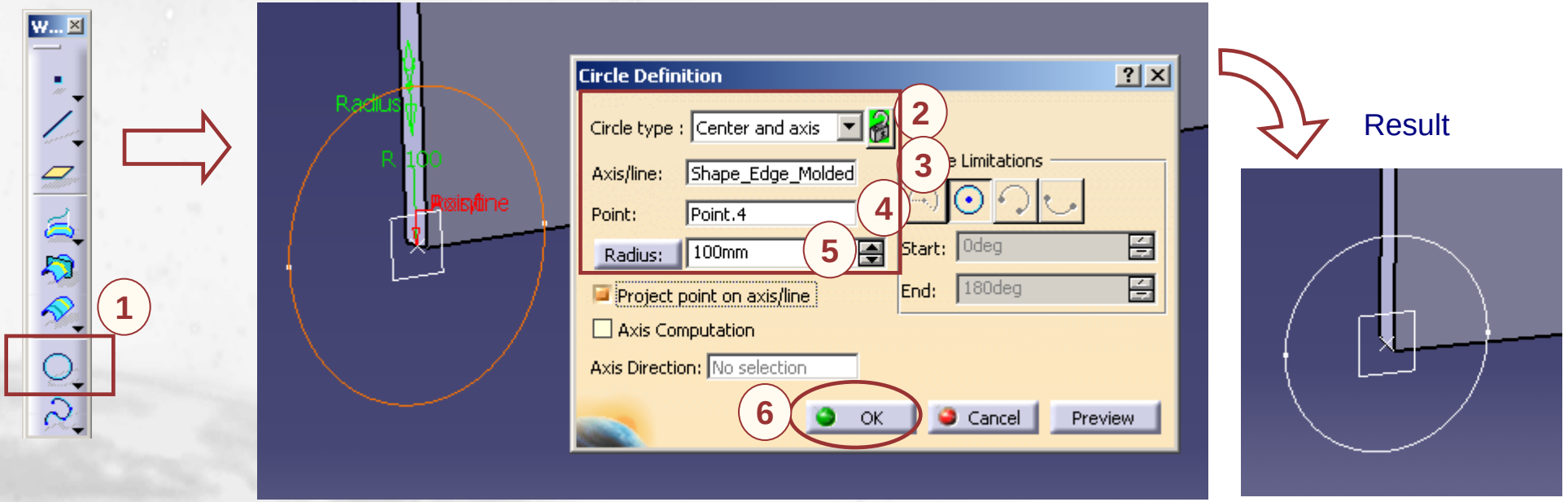


6.1 Define EndCut using UDF technology ...continued

New R16

Circle Definition: Under the currently activated "UDF Definition" GeometricalSet, create a Circle centered on the previously created point.

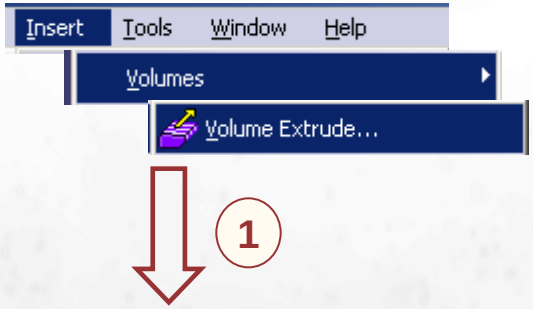
1. Select the GSD "Circle" command.
2. For the "Circle Type" field choose "Center and axis".
3. For the field "Axis/Line" field pick "Shape_Edge_MoldedFlange1_Start" from the GeometricalSet named "Input".
4. For the "Point" field choose previously created point.
5. Specify a Radius of 100mm.
6. Click OK.

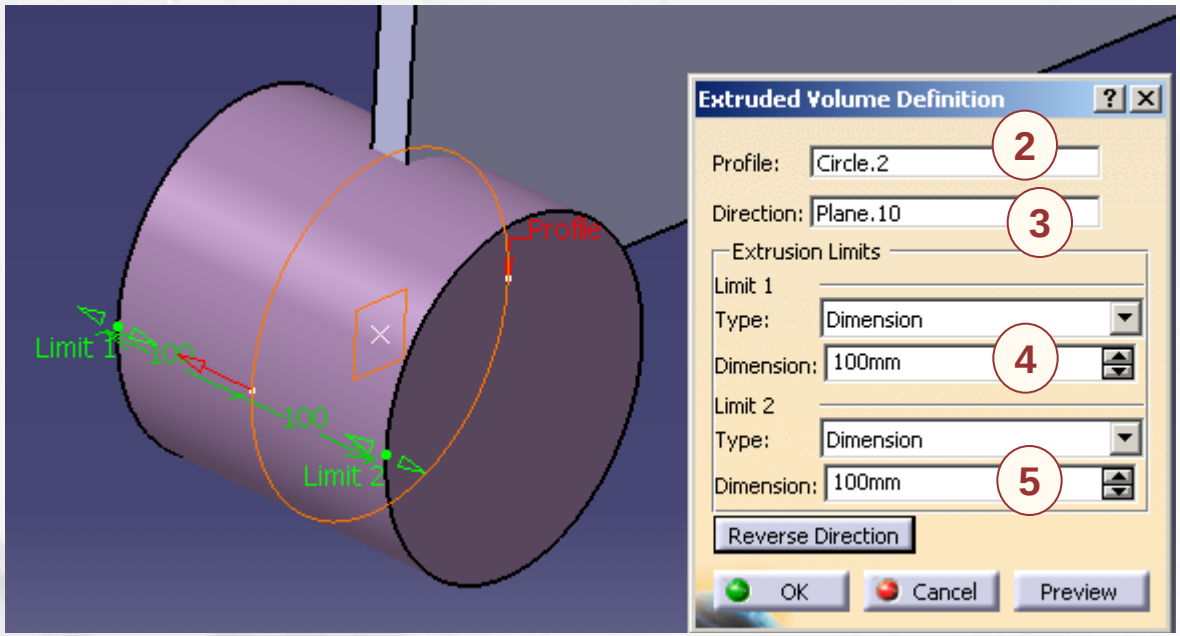


6.1 Define EndCut using UDF technology ...continued

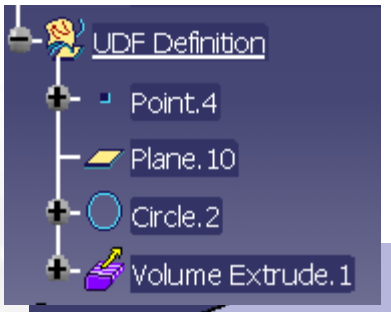
New R16

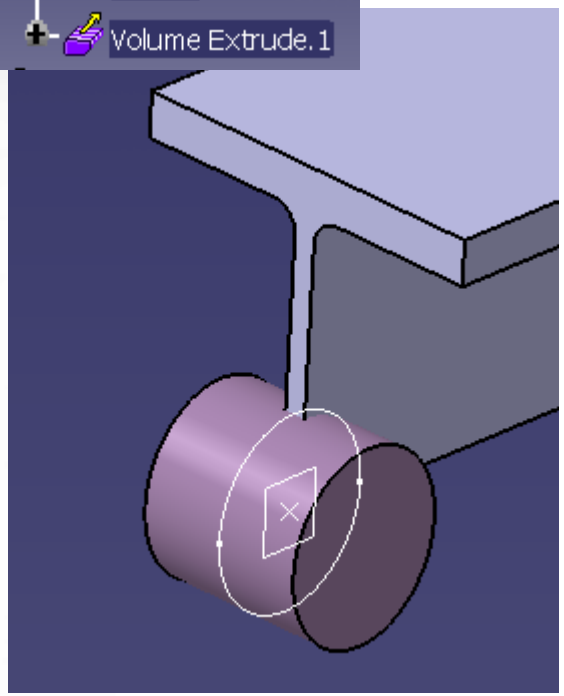
Volume Definition: Create a Volume Extrude from the circle using the plane as direction.





So far UDF definition GeometricalSet in the spec tree looks like this:





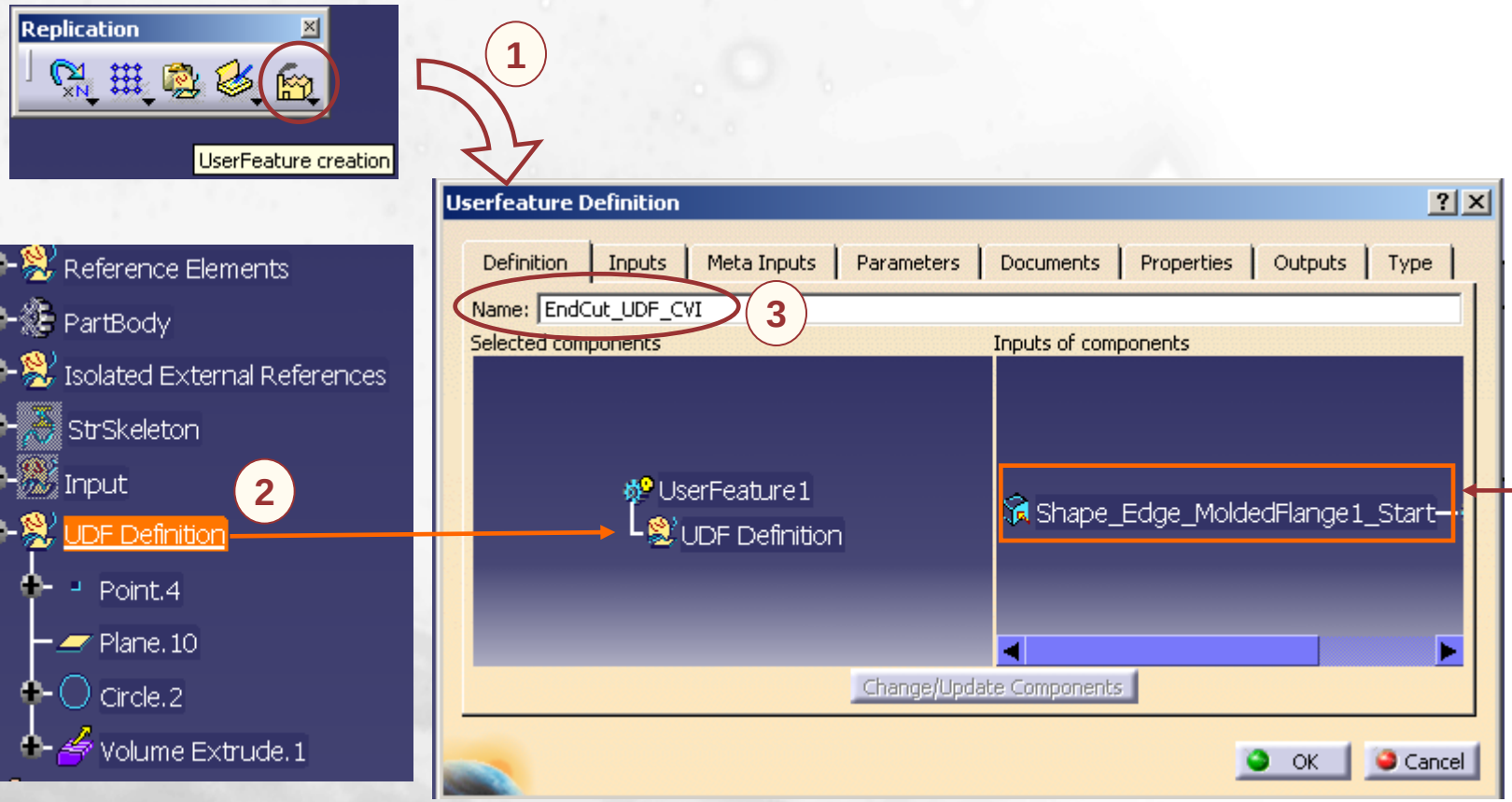
6.1 Define EndCut using UDF technology ...continued

New R16

UDF Definition:

Now our construction geometry is ready, we can create the UDF.

1 In GSD Replication toolbar select Userfeature Creation command.
2 While the Userfeature Definition dialog box is open select the UDF Definition GeometricalSet from the tree.
3. Give any custom name to your UDF.

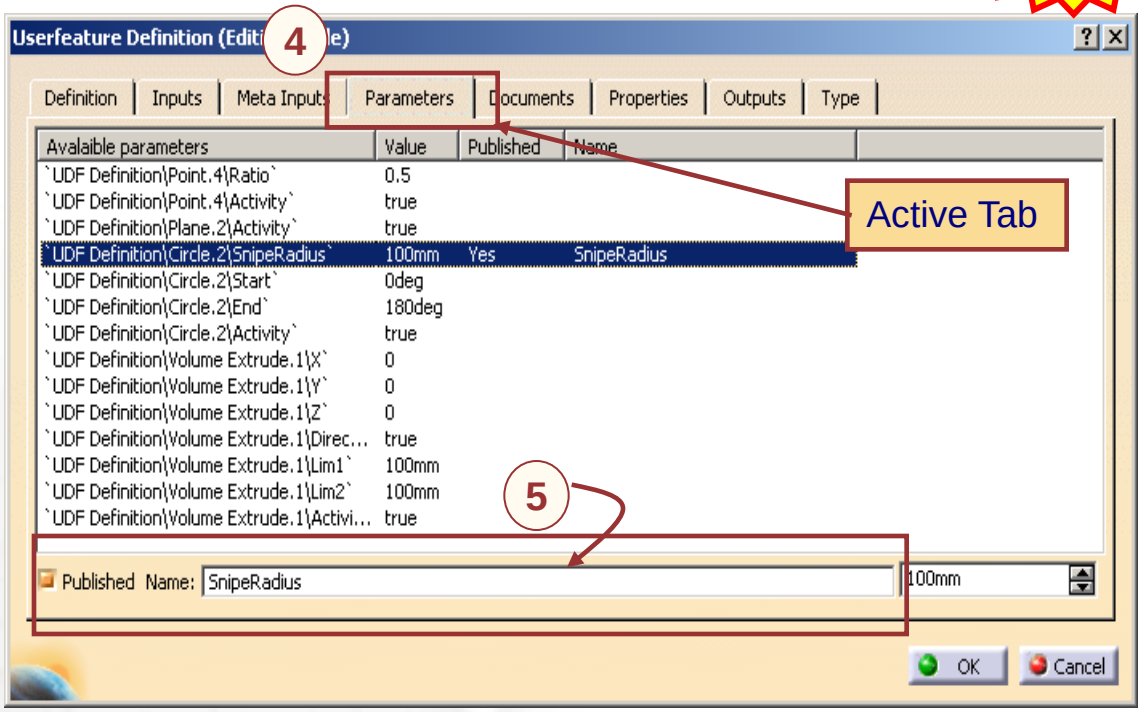


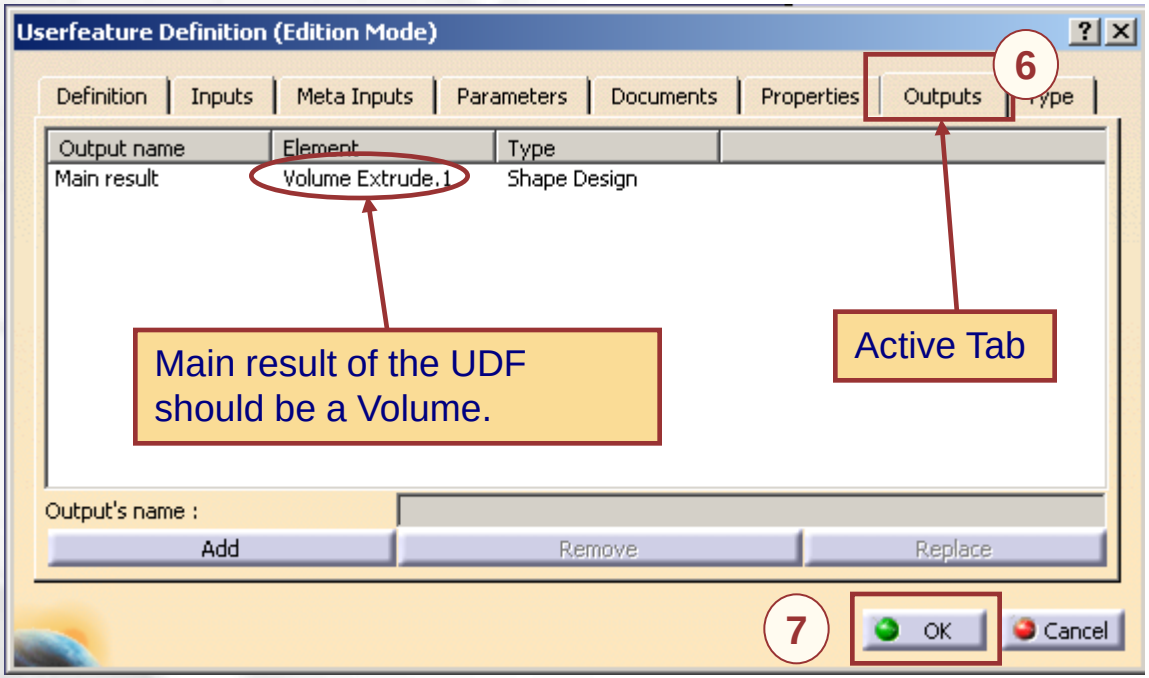
6.1 Define EndCut using UDF technology ...continued

New R16

UDF Definition: ...continued

4. Activate the Parameters Tab
5. Administrator can Publish any parameter so that the EndUser can modify it at the Instantiation time. Publish Radius parameters and rename it.
6. Activate the Output Tab. Notice Output is a volume
7. Click OK.
8. Right-click on the UDF from specification tree and select Local Update.



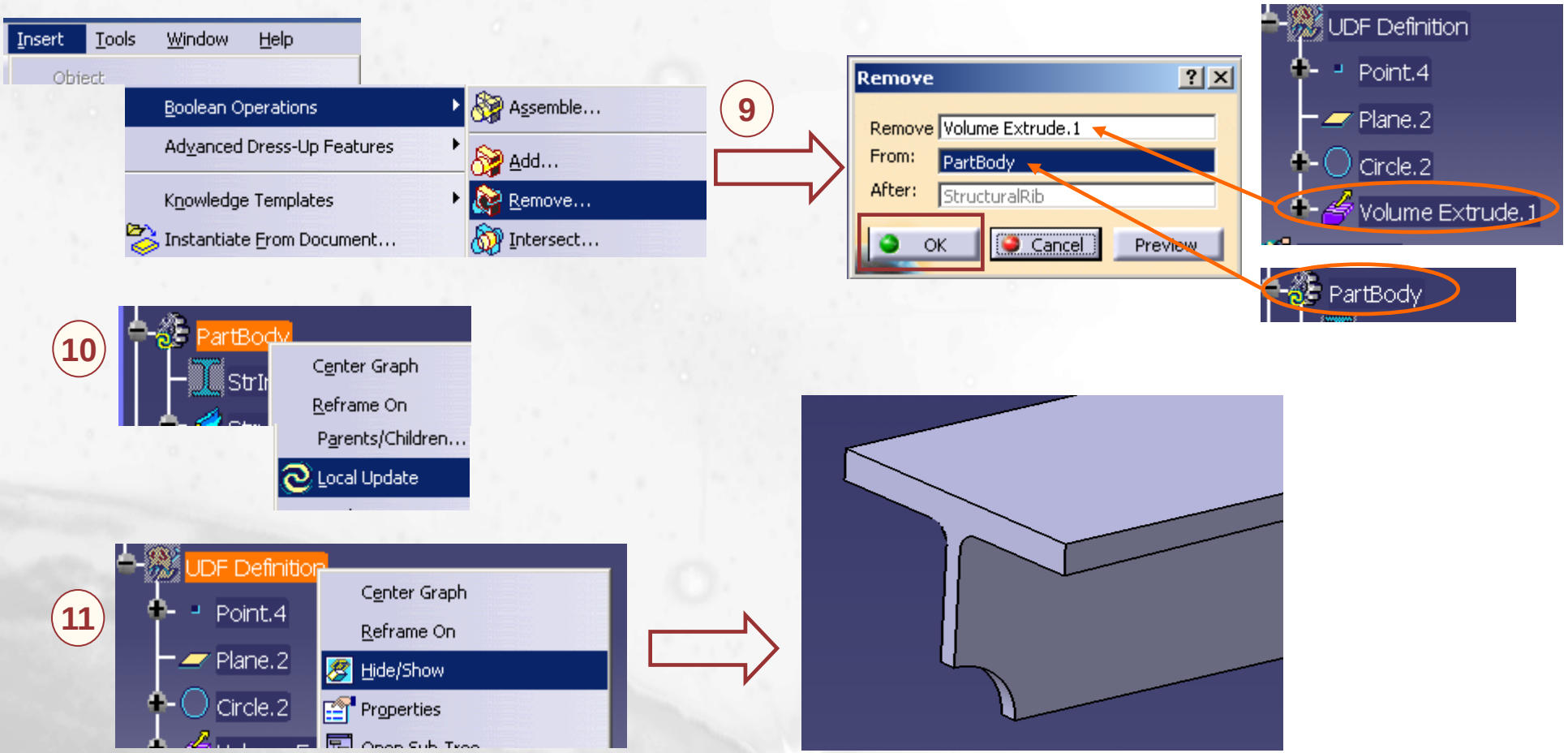


6.1 Define EndCut using UDF technology ...continued

New R16

UDF Definition: ...continued

9. Now we will add Boolean remove feature to the Part body so that we do not see the Cylinder volume in the preview.
   Insert → Boolean Operations → Remove
   For "Remove" field select Volume Extrude and for "From" field select PartBody. Click OK.
10. Do Local Update on PartBody
11. Hide the UDF Definition from the specification tree.

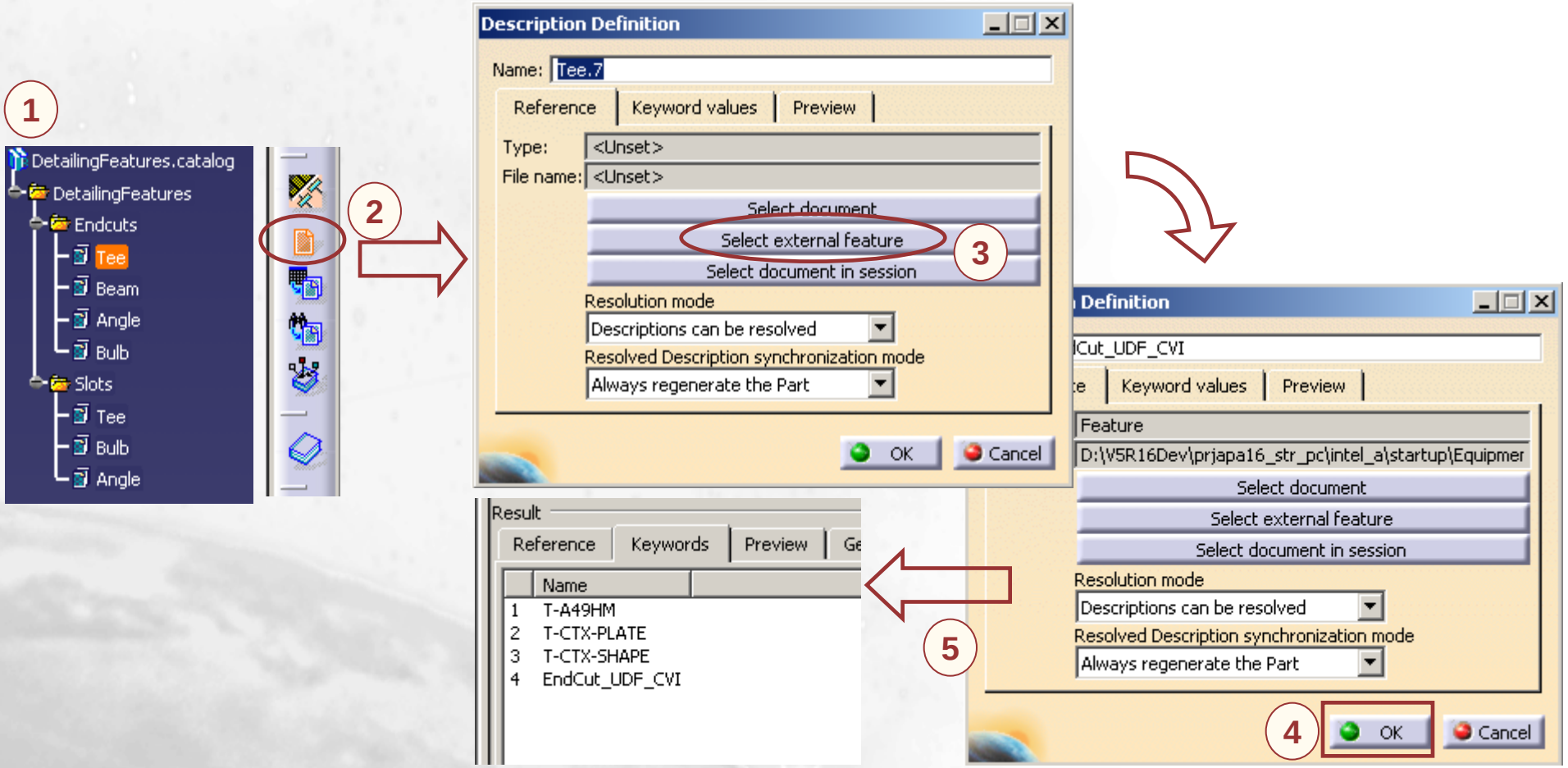


6.2 Add EndCut to the detailing features catalog

New R16

1. Open the DetailingFeatures catalog. This is a catalog of UDFs for EndCuts and Slots.
2. Activate the chapter “Tee” and click on the “Add Component” command.
3. Click on the “Select external feature” command and from the design document select the UDF from the tree under the Knowledge template.
4. Click OK.
5. Notice the UDF is added to the catalog.
6. Save the catalog.

DetailingFeatures catalog →

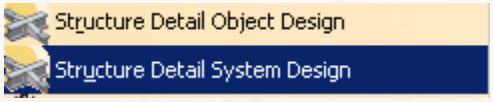


EndUser Task: Instantiation of the EndCut

New R16

1. Open Structure Detail System Design workbench
2. Check project resources to make sure it points to the correct detailing features catalog.
3. Create a Design Unit.
4. Invoke Structure Detail Object Design Workbench and create one Deck and two transversal Bulkheads using the Plate command.

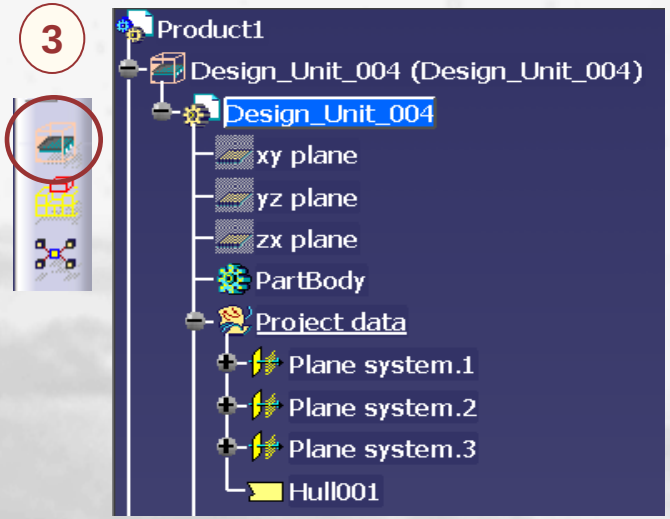
1



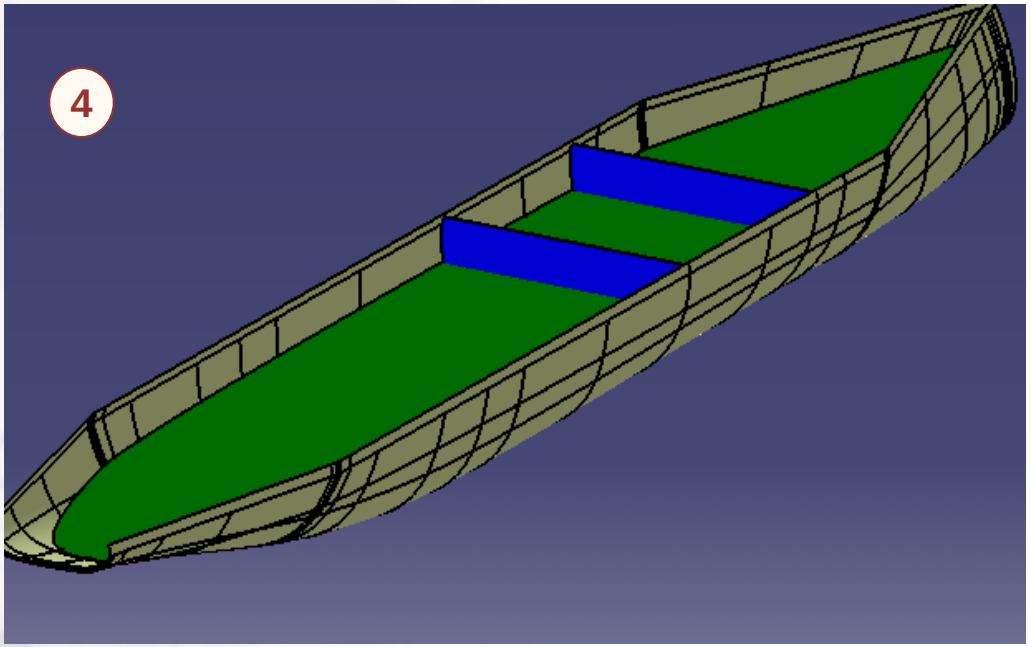
2

Resource	Scope	Location
StrFunctionalDesignColorSchema		D:\V5R16Dev\prjapa16_str_pc\intel_a\startup\EquipmentAndSystems\StrFunctionalDesign\DataDictionary
FunctionalToDetailClassMapping		D:\V5R16Dev\prjapa16_str_pc\intel_a\startup\EquipmentAndSystems\StructureDetailDesign\FunctionPhysicalClassMapping.txt
StructureDetailDesignCatalog		D:\V5R16Dev\prjapa16_str_pc\intel_a\startup\EquipmentAndSystems\Structure\DetailingFeatures\DetailingFeatures.catalog
StructureSpecificationsCatalog		D:\V5R16Dev\prjapa16_str_pc\intel_a\startup\components\StructuralCatalogs\Materials\StructureSpecifications.catalog

3



4



EndUser Task: Instantiation of the EndCut

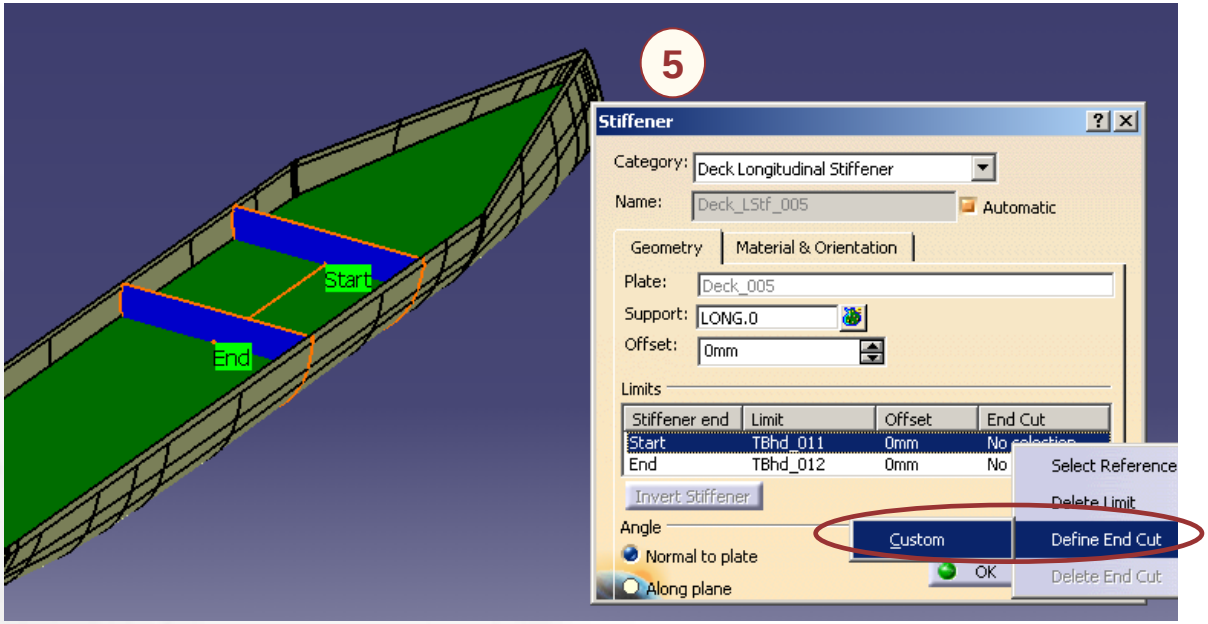
New R16

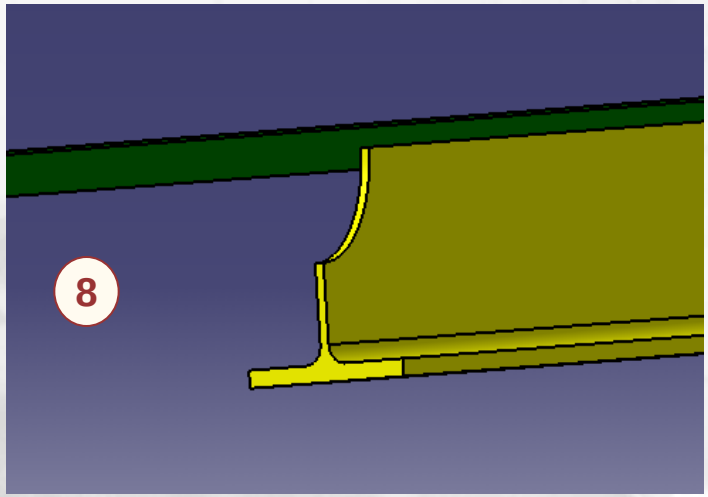
5. Place stiffeners on the Deck using “Stiffener” command and limit it by the Transversal Bulkheads as shown.
   For this exercise pick the section WT8X25 from Material & Orientation tab.

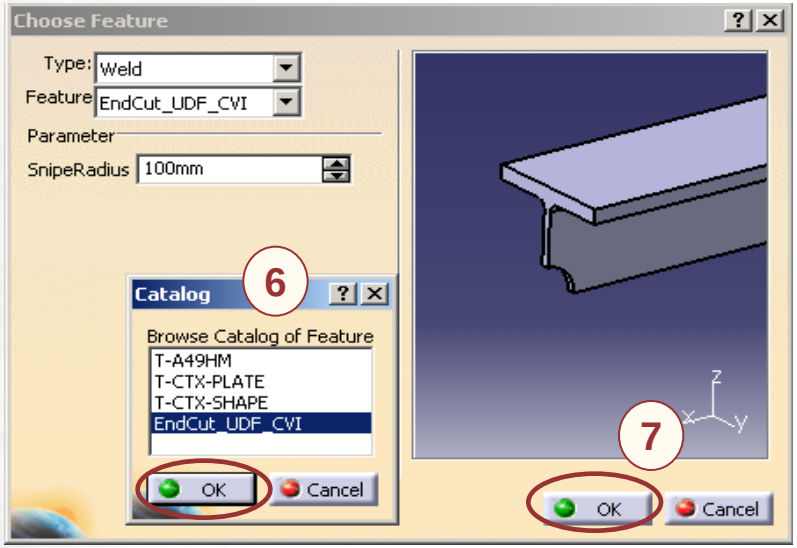
6. Define an end cut at one of the extremities of the stiffener. From the catalog feature browser window pick EndCut_UDF_CVI that we added to the catalog. Click OK.

7. click OK on “Choose Feature” dialog box.

8. Zoom in to see the Endcut on the stiffener.







END