

WHEN TRUST MATTERS

SESAM USER COURSE

GENIE WORKSHOP

PLN EXPORT – FOWT FOUNDATION



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1 ABOUT THE WORKSHOP



This workshop will guide you through how to create a section model .pln file from a floating offshore wind turbine (FOWT) foundation model in GeniE. The following steps will be explained:

- Create curves from existing surfaces in GeniE
- Prepare curves and export .pln file
- Optional: Import the section model .pln file into HydroD

The following files will be needed:

- FOWT_Model.js
- Optional: FOWT_PLN_Export.js (Note: Contains all command lines of all steps described in this workshop)



2 CREATE CURVES

A .pln file consists of several patches, where each patch contains a set of curves, and each curve contains a set of point coordinates. These point coordinates are retrieved from the Guide Curves which will be created in this chapter.

The number of curves will influence the quality of the .pln file. Patches are assumed to be linear between each point, thus curved edges and surfaces require a sufficient discretization.

2.1 GeniE workspace

The first step is to create a new GeniE workspace and prepare the FOWT foundation model.

- Open GeniE V8.11 and create a new GeniE workspace. Make sure to set the user interface mode as full mode.
- Select File > Read Command File and browse the FOWT_Model.js file to create the FOWT foundation model.



2.2 Create curves for upper column

(This sub-section explains the line 1~81 in the optional file FOWT_PLN_Export.js)

2.2.1 Change default names for guide curves

Before creating the curves, it is better to change the default names of new Guide Curves. This is for easy categorization of existing curves.

• Select Edit > Rules > Default Names



Edit View Guiding Geom	etry Structure	Loads Mesh & Analysis Re
Image: Second Structure Image: Second Structure Image: Second Structure Image: Second Structure </td <td>mes Ctrl+Z Ctrl+U Ctrl+T Del</td> <td>" © © © X ↔ ↔ erty I ✓ I ∕ S • / • ↓ × ↓ • ↓ BX IX A ~ K & X</td>	mes Ctrl+Z Ctrl+U Ctrl+T Del	" © © © X ↔ ↔ erty I ✓ I ∕ S • / • ↓ × ↓ • ↓ BX IX A ~ K & X
Rules Licenses / features Capacity Compartments Environment Equipment Properties Structure User Defined Objects Utilities	Analysis Capacity Capacity Compartments Environment Equipment Properties Structure User Defined O Utilities	Beam creation Iransformation Joint <u>c</u> reation Joint <u>d</u> esign Iolerances Connected <u>m</u> ove <u>G</u> eometry Meshing Rules m/s <u>U</u> nits Sets Compatibility <u>D</u> efault Names

- In Customize dialog:
 - Change **Prefix** of **Guide Curve** to "UpperColumn_RevolveSection"
 - Change Counter of Guide Curve to "1"

🛄 Customize 🔶 🗙								
Default names								
Default Shor	t Names D	efault Lor	ng Names	Use copy clone name rule				
	Prefix	Counter	Suffix	Example:				
Plate:	PI	45		Pl45				
Beam:	Bm	571		Bm571				
Joint:	Jt	1		Jt1				
Equipment:	Equipment	1		Equipment1				
Load case / combination:	LC	49		LC49				
Support:	Sp	4		Sp4				
Guide Plane:	GuidePlane	2		GuidePlane2				
Point:	Point	1		Point1				
Guide Curve:	UpperColur	1		UpperColumn_RevolveSection1				
Material:	Mat	4		Mat4				

• Click **OK**

2.2.2 Create curves

Create the curves of the upper column of set Column_1.

• Select **PI7**and **PI8** (i.e. the highlighted shells/plates in picture below) or select them in the Browser folder.



FOWT_PLN_Export_worshop	Name	Description	Section	Needs r
🗄 🧰 Analysis	Connections	Folder		
Capacity	Details	Folder		
Compartments	External Matrices	Folder		
	Features	Folder		
	Holes	Folder		
Properties	PI1	Curved Shell		Yes
E- Structure	Pl2	Curved Shell		Yes
	PI3	Curved Shell		Yes
	Pl4	Curved Shell		Yes
Eeatures	PI5	Curved Shell		Yes
- Holes	PI7	Curved Shell		Yes
Point Masses	PI8	Curved Shell		Yes
	PI9	Curved Shell		Yes
Supports	Pl 10	Curved Shell		Yes

• Select Guiding Geometry > Curves on Surfaces > Plate/Shell Intersections with Family of Planes.

Guiding Geometry	Structure Loads Mesh & Analysis Results Help
Points	▶ ??`````````````````````````````</td
Lines Polylines	Property 1 🔽 📝 🔯
Conic Sections	· · · · · · · · · · · · · · · · · · ·
Free-Form Curve Split/Join Curves	5 · III IA A ~ K 🔍 K 🗈 🗳 🕂 ላ 🖾
Curves on Surfac	es 🔸 🛀 Model Curve
Planes	Shortest Curve on Edges Shortest Curve on Faces
Point Sets	Plate/Shell Intersection with Plane
Point Grids	Plate/Shell Intersections with Family of Planes
Modelling Grids	Project Curve on Plate/Shell

- In the opened dialog, set the parameters as given below:
 - Select Y Plane
 - \circ **YCoord** = 0 m
 - Radial Planes' step: 180/39
 - Number of planes: 39
 - Around Axis Point: Point(-28.87 m,0 m,12 m)
 - Around Axis Direction: 0 0 1



Create a set of curves by cutting the selected surfaces with a family of plan	nes <u>? x</u>				
Selected Plates/Shells PI7;PI8;					
Select Planes					
X Y Z Point/Vector 3-Points YCoord: 0 ि, m					
Parallel Planes' step m Radial Planes' step 180/39 deg Around Axis					
Point -28.87 0 12 Direction 0 0 1	R,m R,m				
Number of planes 39 Preview OK	Apply				

- Toggle the Preview option to show the preview
- Click OK
- Go to browser folder **Utilities Guiding Geometry Curves**, observe that 40 new guide curves (Guide NURBS) named as *UpperColumn_RevolveSection1~40* are generated.





2.3 Create curves for lower column

2.3.1 Create curves for top circle of lower column

(Line 83~163 in FOWT_PLN_Export.js)

- Change default names of guide curve to set appropriate prefix and counter
 - Change Prefix of Guide Curve to "TopCircle_RevolveSection"
 - Change Counter of Guide Curve to "1"

Cuide Current	TopCircle E	1	TopCircle RevolveSection1
Guide Curve:	Topolice_r	1	Topolicie_Kevolvesecuori

- Select Pl14 and Pl16.
- Create curves using the **Plate/Shell Intersections with Family of Planes** again. (Note: No need to change settings in the dialog, since previous settings are remembered.)

Create a set of curves by cutting the selected surfaces with a family of planes
Selected Plates/Shells Pl14;Pl16; ©
Select Planes X Y Z Point/Vector 3-Points YCoord: 0 Dm
C Parallel Planes' step m Radial Planes' step 180/39 deg Around Axis Point -28.87 0 12 b, m Direction 0 0 1 b, m
Number of planes 39
V Preview OK Cancel Apply

• In browser folder **Utilities - Guiding Geometry - Curves**, observe that 40 new guide curves named as *TopCircle_RevolveSection1~40* are generated.

2.3.2 Create curves for side plates of lower column

(Line 165~245 in FOWT_PLN_Export.js)

- Change default names of guide curve to set appropriate prefix and counter
 - Change Prefix of Guide Curve to "LowerColumn_RevolveSection"
 - Change Counter of Guide Curve to "1"

Guide Curve:	LowerColur	1	LowerColumn_RevolveSection1
--------------	------------	---	-----------------------------

- Select Pl1 and Pl2.
- Create curves using Plate/Shell Intersections with Family of Planes (Note: No need to change settings in plate/shell intersections with family of planes dialog, since previous settings are remembered.)



Create a set of curves by cutting the selected surfaces with a family of planes
Selected Plates/Shells
₽.
Select Planes X Y Z Point/Vector 3-Points
YCoord: 0 k m
C Parallel Planes' stepm
Number of planes 39
V Preview OK Cancel Apply

• In browser folder **Utilities - Guiding Geometry - Curves**, observe that 40 new guide curves named as *LowerColumn_RevolveSection1~40* are generated.

2.4 Create curves for bottom plate

Guide curves for bottom plate will be divided into outer part and inner part of the circle.

2.4.1 Create curves for circle outer part of bottom plate

(Line 247~355 in FOWT_PLN_Export.js)

- Change default names of guide curves to set appropriate prefix and counter
 - Change **Prefix** of **Guide Curve** to "Bottom_CircleOuterSection"
 - Change Counter of Guide Curve to "1"

Guide Curve:	Bottom_Cir	1		Bottom_CircleOuterSection1	
--------------	------------	---	--	----------------------------	--

- Select PI5.
- Create curves using **Plate/Shell Intersections with Family of Planes** and change parameters as given below.
 - Radial planes' step: 180/40
 - Number of planes: 21
- Click OK.

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	Image: Create a set of curves by cutting the selected surfaces with a family of planes ? Selected Plates/Shells PI5; Select Planes ?
	x Y Z Point/Vector 3-Points YCoord: 0 12, m
	C Parallel Planes' step m Image: Step Image: Step m Point -28.87 m,0 m,12 m) k₂ m Direction 0 0 1 Number of planes 21
	Preview OK Cancel Apply

- In browser folder Utilities Guiding Geometry Curves, observe that 21 new guide curves named as *Bottom_CircleOuterSection1~21* are generated.
- Create two guide lines using the intersections points between Curve9 and Bottom_CircleOuterSection1, 11, and 21, respectively.
 - Click on Guiding Geometry > Lines > From Two Points to create a new guide line.



- Create guide line "Bottom_CircleOuterSection22" from Point(-19.87 m,0 m,-20 m) to Point(-22.50603897 m,6.363961031 m,-20 m) (i.e. intersection points of *Curve9* with *Bottom_CircleOuterSection1* and *11* marked with 1 and 2 in the image below. Only show these curves for easier point snapping.)
- Create another guide line "Bottom_CircleOuterSection23" from Point(-22.50603897 m,6.363961031 m,-20 m) to Point(-28.87 m,9 m,-20 m) (i.e. intersection points of *Curve9* with *Bottom_CircleOuterSection11* and 21 marked with 2 and 3 in the image below)





- Select *Bottom_CircleOuterSection1~11* and **right-click** one of them. Then select **Divide**.
- Use **Divide curves with structure** method, divide against *Bottom_CircleOuterSection22*.

Divide Guide Curves	? ×
 Divide Beams and Segments Divide Support Curves Divide Plates Divide Guide Curves Explode all structure in selection into simpler parts Divide Guide Curves Divide curves at position Divide curves with plane Divide curves with structure Insert knuckle point at intersection Select object to split selection against. Bottom_CircleOuterSection22 	Apply Cancel

- Select *Bottom_CircleOuterSection12~21* and **right-click > Divide**.
- Use **Divide curves with structure** method, divide against *Buttom_CircleOuterSection23*.





• Select curves *Bottom_CircleOuterSection1~21* and **right-click > Delete** to keep only the shorter curves after the divide operation.



• Also delete curve *Bottom_CircleOuterSection23*, since it will not be part of the patches to export. Deleting it can avoid possible mistake in creating sets of patches.





- Select curves *Bottom_CircleOuterSection24~43* in Browses, right-click > Copy;
 - Select **Mirror** tab, set parameters as given below:
 - Point in mirror plane (P1): -28.87 0 -20
 - Mirror plane normal vector: 100
 - Toggle Preview
- Click Apply.



• *Bottom_CircleOuterSection24~64* now form the outer circle patch.

2.4.2 Create curves for circle inner part of bottom plate

(Line 357~393 in FOWT_PLN_Export.js)

- Change default names of guide curves to set appropriate prefix and counter
 - Change Prefix of Guide Curve to "Bottom_CircleInnerSection"
 Change Counter of Guide Curve to "0"

Guide Curve:	Bottom_Cir	0	Bottom_CircleInnerSection0
--------------	------------	---	----------------------------

Create a guide line "Bottom_CircleInnerSection0" from Point(-19.87 m,0 m,-20 m) to Point(-28.87 m,0 m,-20 m) (i.e. End point of *Bottom_CircleOuterSection24* and the center of the bottom plate)

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• Rename *Bottom_CircleOuterSection22* to "Bottom_CircleInnerSection1", since this curve will belong to the inner circle patch



- Create guide points along Bottom_CircleInnerSection0
 - Click on Guiding Geometry > Points > Curve Points at Equal Intervals

Guiding Geometry	Structur	e Loads Mesh & Analysis Results Help
Points	•	• Guide <u>P</u> oint Dialog
Lines Polylines Conic Sections Free-Form Curve Split/Join Curves	+ + +	 Point Middle of Two Points Barycenter of a List of Points Point on Curve Point on Surface
Curves on Surfac	es F	Closest to Point on Selection
Point Sets Point Grids Modelling Grids)))	Control Points Knot Vector Points Curve Points at Equal Lengths Curve Points at Equal Intervals
Iransformations	•	

• Click on the curve Bottom_CircleInnerSection0





• In Number of Points dialog, change value of Number to "11" and click OK.

Number of	Points		? ×
Number:	11		
	ОК	Cancel	Apply

- $\circ~$ Press Esc key to exit current creation function.
- Observe that *Point4~14* are created along the curve *Bottom_CircleInnerSection0* at equal intervals.



- To make snap to points in the following steps easier, change the selection switches of different item types:
 - \circ Beam selection: OFF
 - Plate selection: ON
 - GuidePoint selection: ON



• Create ten guide lines as shown in red below. Each guide line is created from *Point4~14* to the end of curve *Bottom_CircleOuterSection35~44*, respectively.



• Delete curve *Bottom_CircleInnerSection0* since it will not be part of the patches to export. Deleting it can avoid possible mistake in creating sets of patches



• Copy mirror curves *Bottom_CircleInnerSection1~10* (Note: No need to change settings in copy dialog, since previous settings are remembered.)



• *Bottom_CircleInnerSection1~21* now forms the inner circle patch.

3 COPY CURVES AND CREATE SETS

3.1 Copy curves

(Line 395~760 in FOWT_PLN_Export.js)

- Before copying the curves, it's better to set copy clone name rule. This way, curves created by copying will still be named after their original curves.
 - Open Edit > Rules > Default Names

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• In Customize dialog, turn ON the Use copy clone name rule, and click OK

C	🖳 Customi	ze			? ×
I	Default name	es			
	Default S	hort Names	Default Lor	ng Names	✓ Use copy clone name rule
		Prefix	Counter	Suffix	Example:
	Plate:	PI	45		PI45
				-	

- Select all curves created in Chapter 2, i.e., all curves named with the following prefixes:
 - UpperColumn_RevolveSection
 - TopCircle_RevolveSection
 - LowerColumn_RevolveSection
 - Bottom_CircleOuterSection
 - Bottom_CircleInnerSection
- Copy translate all selected curves with Vector3d(43.305 m,25.00215341 m,0 m) or by picking Guiding points: *point 1 and point 3* (i.e. Vector from center of *Column_1* to *Column_2*)



 Select all the copied curves in above step, i.e., all curves named with suffix "_1", then

copy mirror with parameters given below

- Point in mirror plane: Point(14.435 m,25.00215341 m,-20 m) (i.e. Point3)
- Mirror plane normal vector: 010



• Curves created by this step will be named with suffix "_1_1"

3.2 Create sets

(Line 762~777 in FOWT_PLN_Export.js)

In the .pln file, each patch is equivalent to a *Set* in GeniE. It is therefore important that the curves are stored in the correct Sets before they are read into HydroD.



A total of **15 dynamic sets** should be created. The name and content of each set is given in table below:

.	
Curves	Set
UpperColumn_RevolveSection1~40	UpperColumn_RevolvePatch
UpperColumn_RevolveSection1_1~40_1	UpperColumn_RevolvePatch_1
UpperColumn_RevolveSection1_1_1~40_1_1	Mirror_UpperColumn_RevolvePatch
TopCircle_RevolveSection1~40	TopCircle_RevolvePatch
TopCircle_RevolveSection1_1~40_1	TopCircle_RevolvePatch_1
TopCircle_RevolveSection1_1_1~40_1_1	Mirror_TopCircle_RevolvePatch
LowerColumn_RevolveSection1~40	LowerColumn_RevolvePatch
LowerColumn_RevolveSection1_1~40_1	LowerColumn_RevolvePatch_1
LowerColumn_RevolveSection1_1_1~40_1_1	Mirror_LowerColumn_RevolvePatch
Bottom_CircleOuterSection24~64	Bottom_CircleOuterPatch
Bottom_CircleOuterSection24_1~64_1	Bottom_CircleOuterPatch_1
Bottom_CircleOuterSection24_1_1~64_1_1	Mirror_Bottom_CircleOuterPatch
Bottom_CircleInnerSection1~21	Bottom_CircleInnerPatch
Bottom_CircleInnerSection1_1~21_1	Bottom_CircleInnerPatch_1
Bottom_CircleInnerSection1_1_1~21_1_1	Mirror_Bottom_CircleInnerPatch

Taking *UpperColumn_RevolvePatch* as an example, follow these steps to create the dynamic set:

- Go to browser folder, right-click Sets Dynamic Sets and select New Dynamic Set.
- Give the name as UpperColumn_RevolvePatch
- Select And and Lhs
- Select String and set Query as Name
- Fill String Mask with UpperColumn_RevolveSection*

	Dynamic Set	? ×
 Utilities Cut Planes Evaluators Guiding Geometry Mesh Priorities Model Views Reports Sets Dynamic Tests Color code by Set Memberssip Fields Save HTML Report 	Name: UpperColumn_RevolvePatch Box Plane String Line Not And Or Lhs Rhs Box Plane String Line Not And Or Query: Not Vane Vane Vane Vane Vane Vane String Mask: UpperColumn_RevolveSection* Vane Vane Vane Vane String Mask is a regular expression (Regexp) Vane Vane Vane Vane	
	K Cancel Appl Appl	y

• Select Rhs and Not, fill String Mask with UpperColumn_RevolveSection*_1



Dynamic Set	? ×
Name: UpperColumn_RevolvePatch	,
Box Plane String Line Not And Or	
Lhs Rhs	
Box Plane String Line Not And Or	
Box Plane String Line	
Query: Name	
String Mask: UpperColumn_RevolveSection*.	
V Preview OK Cancel	Apply

• Toggle the **Preview** option to show the preview



• Click OK

Repeat the steps above to create remaining dynamic sets as described in the following table. **Note:** Dynamic Set *UpperColumn_RevolvePatch* (marked red in the table) is already created by executing the steps above.

	Conditions:		
Dynamic Set Name	And		
	Lhs > String	Rhs > Not > String	
UpperColumn_RevolvePatch	UpperColumn_RevolveSection*	UpperColumn_RevolveSection*_1	
UpperColumn_RevolvePatch_1	UpperColumn_RevolveSection*_1	UpperColumn_RevolveSection*_1_1	
TopCircle_RevolvePatch	TopCircle_RevolveSection*	TopCircle_RevolveSection*_1	
TopCircle_RevolvePatch_1	TopCircle_RevolveSection*_1 TopCircle_RevolveSection*_1		
LowerColumn_RevolvePatch	LowerColumn_RevolveSection* LowerColumn_RevolveSec		
LowerColumn_RevolvePatch_1	LowerColumn_RevolveSection*_1	LowerColumn_RevolveSection*_1_1	
Bottom_CircleOuterPatch	Bottom_CircleOuterSection*	Bottom_CircleOuterSection*_1	
Bottom_CircleOuterPatch_1	Bottom_CircleOuterSection*_1	Bottom_CircleOuterSection*_1_1	
Bottom_CircleInnerPatch	Bottom_CircleInnerSection*	Bottom_CircleInnerSection*_1	
Bottom_CircleInnerPatch_1	Bottom_CircleInnerSection*_1 Bottom_CircleInnerSection*_1_1		

The dynamic sets start with "Mirror" can be created by following steps:



- Create a new dynamic set and fill name as *Mirror_UpperColumn_RevolvePatch*
- Select String and set Query as Name
- Fill String Mask as UpperColumn_RevolveSection*_1_1
- Click **OK**

Name: Mirror_Up	String Line	Patch		
Query: String Mask:	Name UpperColumn_Revo sk is a regular expres	viveSection*	- 1	

Repeat the steps above to create remaining dynamic sets as shown in the following table.

Note: Dynamic Set *Mirror_UpperColumn_RevolvePatch* (marked red in the table) is already created by executing the steps above.

Dynamic Set Name	Conditions: String
Mirror_UpperColumn_RevolvePatch	UpperColumn_RevolveSection*_1_1
Mirror_TopCircle_RevolvePatch	TopCircle_RevolveSection*_1_1
Mirror_LowerColumn_RevolvePatch	LowerColumn_RevolveSection*_1_1
Mirror_Bottom_CircleOuterPatch	Bottom_CircleOuterSection*_1_1
Mirror_Bottom_CircleInnerPatch	Bottom_CircleInnerSection*_1_1

Verify all dynamic sets have been created correctly.



Note: Another way to create sets is by using Regular Set, first select the curves by their



name in the browser. For example, *UpperColumn_RevolveSection1*, 2, and so on. Then, press **Alt+S** to show only the selected curves to verify the selection. Finally, right-click one of them to add them to named sets.



4 EXPORT PLN FILE

(Line 779~782 in FOWT_PLN_Export.js)

After all curves have been placed in sets, we can export the .pln file.

<u>Click on menu File > Export > Polyline Approximations to PLN file</u>



• Set values in the "Set - IWET - Join" table as given below:



(Note: Use Tab key or Down arrow key to insert new rows in the table)

Patch	Set	IWET	Join
1	Bottom_CircleOuterPatch_1	1	FALSE
2	Bottom_CircleInnerPatch_1	1	FALSE
3	LowerColumn_RevolvePatch_1	1	FALSE
4	TopCircle_RevolvePatch_1	-1	FALSE
5	UpperColumn_RevolvePatch_1	1	FALSE
6	Mirror_Bottom_CircleOuterPatch	-1	FALSE
7	Mirror_Bottom_CircleInnerPatch	-1	FALSE
8	Mirror_LowerColumn_RevolvePatch	-1	FALSE
9	Mirror_TopCircle_RevolvePatch	1	FALSE
10	Mirror_UpperColumn_RevolvePatch	-1	FALSE
11	Bottom_CircleOuterPatch	1	FALSE
12	Bottom_CircleInnerPatch	1	FALSE
13	LowerColumn_RevolvePatch	1	FALSE
14	TopCircle_RevolvePatch	-1	FALSE
15	UpperColumn_RevolvePatch	1	FALSE

- Specify other parameters in the dialog as given below
 - **ISYM:** 1
 - **AP:** -40.87
 - **FP: 26.435**
 - Approximation tolerance: 0.001
- Set File name, for example, to "OWT_1.pln"
- Click **OK**

Note that the IWET starboard (left) and port (right) sides are local for each pontoon/column, not the global left or right side. The description of the IWET values corresponding to patch types in HydroD is shown below:

IWET	Description		
-10	WetLeftNoWaterline		
-1	WetLeft		
1	WetRight		
10	WetRightNoWaterline		



	Set			IWET		Join		
1	Bottom_CircleOuterP	atch_1	▼ 1		•			
2	Bottom_CircleInnerP	atch_1	▼ 1		-			H
3	LowerColumn_Revol	vePatch_1	▼ 1		-			
4	TopCircle_RevolvePa	tch_1	▼ -	1	-			
5	 UpperColumn_Revol 	vePatch_1	▼ 1		-			-
	ISYM	1		83				
	AP	-40.87		m 🔗 ?				
	FP	26.435		m 🞖 ?				
	Approximation tolerance	0.001		m 🔗 ?				
ile: OWT_1.pln							Browse	·
Journal export	operation							

• **OWT_1.pln** file will be exported and saved in the current GeniE workspace folder.

Note: Completed model is also provided as FOWT_PLN_Complete.gnx and FOWT_PLN_Complete.gnx files for reference.

5 OPTIONAL: IMPORTING PLN FILE INTO HYDROD

This last step illustrates how to import the .pln file into HydroD.

• Start HydroD V7.2 and create a new workspace by selecting File > New.

5.1 Create section model

 Right-click the Models folder and select Add SectionModel.





- In the Properties view of the newly created SectionModel1, select OWT_1.pln as file name. (click the three dots button to browse the file)
- Right-click SectionModel1 > Create patches from file. The section model should be visible in the 3D view.

Properties SectionModel1	~ ŋ	×
Source File name 💡 📃 Copy to workspace 💡 🗹	\OWT_1.pln	
🔺 🕌 Models		_
SectionModel1	()) () () () () () () () () (>
Pure Andrew HydroModels	Create patches from file UpBate patches C Reload	



5.2 Create element model

- Right-click the Models folder and select Add ElementModel.
- In the Properties view of the newly created ElementModel1, tick Create from section model and select SectionModel1.
- Right-click ElementModel1 > Generate mesh from section model.

ElementModel1		
Source		
File name	Ŷ	
Copy to workspace		
Create from section mo	del 💡 🗹	
Section model	💡 🐗 SectionModel1 🗸 🗸	
		\sim
Element number pref	fix 💡 73	<u> </u>
Element number pref	fix 💡 73	
Element number pref	fix 💡 73	
Element number pref	fix 💡 73	•
Element number pref Models SectionModel ElementMode	fix 9 73	•
Element number pref	fix 9 73	•

5.3 Verify and correct element model

• Check the generated mesh by activating/deactivating the eye icons in the



workspace browser so that only the **ElementModel1** is shown.

- If the mesh edge is not shown, in ElementModel1 Properties view click Style tab and check Plates > Show edges.
- Notice the mesh of the *TopCircle* patches is not good as shown below. The reason is that the last curve in the patch is reversed.



• Expand SectionModel1 folder, expand PatchesFolder1, expand TopCircle_RevolvePatch_1, and select TopCircle_RevolvePatch_1_Polyline_39.



• Reverse the points by copying the first row to the third row and then deleting the first row. The table should be as shown below after the operation:

Properties v 🗜 X							
🍾 TopCircle_RevolvePatch_1_Polyline_39							
General							
Index	40						
Active	Active 💡 🗹						
Section points							
Section points	· 🖗						
\leq	Х	Y	Z				
1	8.435 m	25.002 m	-14 m				
2	2.435 m	25.002 m	-14 m				
+							

• Repeat the operation for Mirror_TopCircle_RevolvePatch_Polyline_39 and TopCircle_RevolvePatch_Polyline_39.



• Right-click **ElementModel1** > **Generate mesh from section model** again. The mesh should be corrected now.



Note: For more details on the settings of section model's mesh generation, refer to HydroD example 4 "Wadam and Wasim analysis of a ship"

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We are the independent expert in risk management and quality assurance. Driven by our purpose, to safeguard life, property and the environment, we empower our customers and their stakeholders with facts and reliable insights so that critical decisions can be made with confidence. As a trusted voice for many of the world's most successful organizations, we use our knowledge to advance safety and performance, set industry benchmarks, and inspire and invent solutions to tackle global transformations.

Digital Solutions

DNV is a world-leading provider of digital solutions and software applications with focus on the energy, maritime and healthcare markets. Our solutions are used worldwide to manage risk and performance for wind turbines, electric grids, pipelines, processing plants, offshore structures, ships, and more. Supported by our domain knowledge and Veracity assurance platform, we enable companies to digitize and manage business critical activities in a sustainable, cost-efficient, safe and secure way.