

SESAM EXAMPLE

Code Checks using GeniE

Workshop in code check of an offshore fixed platform





Sesam Example

Code Checks of Jacket Using GeniE

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1 Introduction

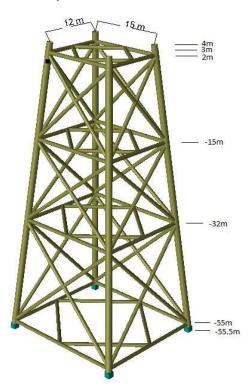
This workshop goes through the code checks for an offshore fixed platform using the software suite Sesam. It includes member/tubular connection code checks. The Sesam modules GeniE, Wajac, Gensod, Splice and Sestra are used.

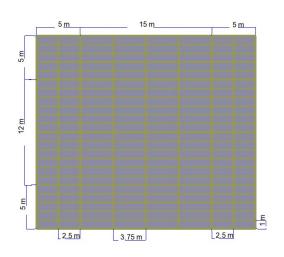
1.1 Program Version

GeniE V8.9-04 Wajac V7.11-01 Sestra V10.17-02 Splice V8.1-00 Sesam Manager V6.6-03 Application Version Manager V3.1-01

2 Model Information

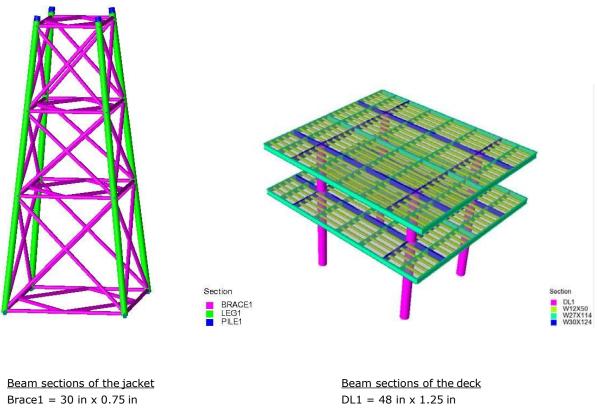
The main jacket and deck dimensions are shown below.







The jacket and deck beam sections are shown below.



Leg1 = 52.5 in x 0.75 in Pile1 = 48 in x 1.25 in Beam sections of the decl DL1 = 48 in x 1.25 in W12x50 W27x114 W30x124

3 Member and Joint Code Checking

Code Checks will be performed on members and tubular connection based on API RP 2A 22nd edition and AISC 9th addition for this workshop.

3.1 Create capacity model

Import GNX file named Model_Start.gnx. This model can be found in the workshop course material. The model is complete with basic load case, load combination and ready to run Analysis1. Run the analysis. Check if you have any error for the analysis. If you didn't manage to run the analysis, please consult the workshop facilitator.

Create new set consist of Jacket set and Deck set. Select both Deck and Jacket set. RMB click on the highlighted elements and select named set. Give the name Jacket_Deck.



Dana Decemb	-	Customizable v <no active="" set=""> v 30 Mar 2023 16:15 GeniEActivity1</no>	Nette Description	30 Mar 2023 16:17 GeniEActivity1
Deck Regular Deck Regular Deck Regular Deck Regular	Move Scale Mass Density Keep mesh Discard mesh Delete Rename	Analysis1 LCSPSTM_090 FEM LoadCase = 22 Analysis results not loaded Force: [kN], Length: [m] No valid mesh available	 Note: Regular Set Note: Regular Set Pries Regular Set @ Jacket_Deck Regular Set 	Analysis1 LCSPSTM_090 FEM Loadcase = 22 Analysis results not loaded Force: [kN], Length. [m] No valid mesh available
	Labels ColorCode Clear Labels Fit Camera to Selection			
	Named set Set Active View options Visible model			
		Name: Dacket_Deck	? ×	
		 No action on selection Include selection in set Remove selection from set 	Set Active	
			OK Cancel Apply	

Then create a capacity manager by RMB clicking Capacity Folder in the browser and select New Capacity Manager. In the Capacity Manager dialog select the Analysis1 and API WSD 2014.

	Capacity Man	ager		_	? ×
	🔖 Name	Cc1			
Load Cases	Analysis	Analysis1		•	8?
Capacity Enviror New CapacityManager	Code Check	API WSD 2	2014	•	83
Equipm Fields by	Code Edition	[~	83
	Corr Add Rule	No Addition	n	•	83
			ок	Cancel	1

RMB click the newly created capacity manager and select Create (Update) Members to create the beam model for the code check. Check the Split at beam end option. Check Subset and select Jacket_Deck.

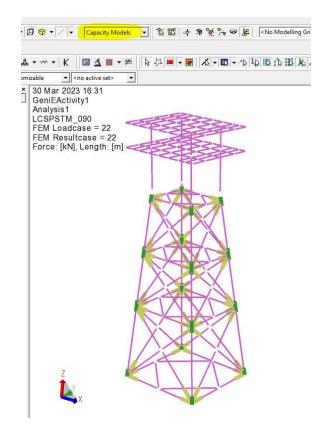
pacity Manager:	Cc1		
Subset:	ket_Deck		-
Structure Criteria			
Split at joint			
Split at incomi			
Split at beam			
🗹 Consider I	eam offset 💡?		
Use "From Stru	cture" Member Opt	ions 💡?	

RMB click the created capacity manager and select Create Joints to create the tubular connection model for the code check.



Capacity	Create Joints	
Create (L	Update) Memby Capacity Ma Update) Panels	anager: Cc1
Equipm Create Jo		OK Cancel

Display the capacity model by selecting Capacity Models view.



The capacity models are displayed both for members and joints.

3.2 Create runs

RMB click the capacity manager and select Add Run and in the dialog appearing select code of practice to be API WSD 2014. This involves that API RP2A 22nd will be used for tubular members and AISC 9th will be used for non-tubular members. Uncheck Joints, the joints will be code checked in a separate run.

Move only the combinations from Available LoadCases to Included LoadCases, and in the General tab uncheck Cap-end forces included. This is consistent with the choice of unchecking Include end forces in the Buoyancy tab when editing the wave load analysis.

DNV		
Create (Update) Members. Create (Update) Panels Create Loints Proper Add Run	Create Code Check Run Capacity Code Check Run Capacity Code Check Run Cancel Indude: Cancel	Create Code Check Run Capacity Cc1 Code Check: API WSD 2014 Include: Commenses Control Code Check: API WSD 2014 Code Check: Co

Add another run, this time checking Joints and unchecking Members. Go to the Joint tab of the same dialog (stretch the dialog horizontally) and set Joint Grouting to From Structure. This means that information on grouting is taken from the concept model.

pacity Cc1				ж				
de Check API WSD 2014			▼ Ca	ncel				
lude: Member								
oadcases General Joint								
Available LoadCases		Included	LoadCases					
Name	Des Ad	d -> Name	Des	ian				
RIKE LCMisc	Ope	emove MLC	SPOPT_000 Ope	eratin				
transfer to the second s	Ope	Rikr LC	SPOPT_045 Ope					
	Ope		SPOPT_090 Ope					
	Ope Ad		SPSTM_000 Sto					
Analysis2.WLC(1, 1)	Ope	Rite	SPSTM_045 Sto					
Analysis2.WLC(2, 1)		ove All	SPSTM_090 Sto	rm				
Analysis2.WLC(3, 1)		min	weis man		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Analysis2.WLC(5, 1)		adcases Gene	loint				-	
Analysis2.WLC(6, 1)		aucases Gene	autorite					
	3	API WSD 2014						
	ł							
	4	Brace	Brace Type	Gap [m]	Through Brace	Critical Joint	Brace Utilization	Joint Grouting [r
	5	Diace						
	1	Cc1.run(2)						

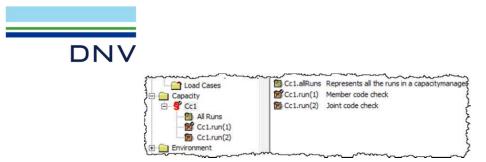
Set the first run (code checking members) as active:

Capacity 	/ men
Cc1.run(Generate Code Ch Execute Code Ch
🗜 🔁 Equipment	Set Active
2 Properties	Edit Description

Change the descriptions for the two runs to 'Member code check' and 'Joint code check', respectively, by RMB clicking and selecting Edit Description as shown below.

Capacity	member(Bm13)	Edit Descriptio	on	X
} ⊡- S Cc1	member(Bm14) member(Bm15)	Object:	Cc1.run(1)	
All Runs		Description:	Member code check	*
} Cc1.run(Generate Code Check Loads			
Environment	Execute Code Check {			
Equipment	Set Active		,	Ŧ
E Properties	Edit Description		ок	Cancel
Compartmen	Save Code Check Report			

r



3.3 Perform code checking

Perform the code checking by two steps. RMB click All Runs and select first Generate Code Check Loads and then Execute Code Check.

Capacity	k joint(Jt14) k joint(Jt15) k joint(Jt16)	Capacity	joint(Jt14) joint(Jt15) joint(Jt15)
- 🗹 Cc1.r.	Generate Code Check Loads	Cc1.ru	Generate Code Check Loads
2 🕅 Cc1.rl	Execute Code Check	Cc1.ru	Execute Code Check
Environment	Set Active	🗧 🕀 🧰 Environment	Set Active
Equipment	Edit Description }	CE Equipment	Edit Description

The forces and moments are computed at the positions where the code check will be performed.

3.4 View code check results

Tabulated code check results are found in the browser by selecting All Runs or the two runs individually.

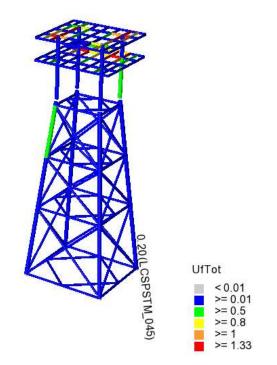
The results are shown for the selected load combination or the worst (*Worst Case (CC)*) meaning whichever combination is the worst one for each member/joint. Stretch the browser pane to see the full table. The selected capacity member/joint will be highlighted also in the display. Click a header, e.g.UfTot (the highest usage factor of all relevant checks), to sort the table in decreasing/increasing order.

Capacity Model	Run	LoadCase	Position	Status	UfTot	Formula	SubCheck	GeomCheck Idealization Method	
K joint(Jt1)	Cc1.run(2)	LCSPOPT_000						······	
K joint(Jt2)	Cc1.run(2)	LCSPSTM_000	Bm64_1	OK	0.20	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt3)	Cc1.run(2)	LCSPOPT_000							
K joint(Jt4)	Cc1.run(2)	LCSPSTM_090	Bm58_1	OK	0.21	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt5)	Cc1.run(2)	LCSPOPT_000							
K joint(Jt6)	Cc1.run(2)	LCSPSTM_090	Bm62_1	OK	0.21	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt7)	Cc1.run(2)	LCSPOPT_000							
K joint(Jt8)	Cc1.run(2)	LCSPSTM_090	Bm57_1	OK	0.20	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt9)	Cc1.run(2)	LCSPSTM_045	Bm64_2	OK	0.26	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt10)	Cc1.run(2)	LCSPSTM_045	Bm72_2	OK	0.21	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt11)	Cc1.run(2)	LCSPSTM_090	Bm80_2	OK	0.28	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt12)	Cc1.run(2)	LCSPOPT_000							
K joint(Jt13)	Cc1.run(2)	LCSPSTM_090	Bm62_2	OK	0.24	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt14)	Cc1.run(2)	LCSPSTM_090	Bm80_1	OK	0.19	uf7.6	API WSD 2014 joint	Geom OK	
joint(Jt15)	Cc1.run(2)	LCSPSTM_090	Bm79_2	OK	0.25	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt16)	Cc1.run(2)	LCSPOPT_000							
K joint(Jt17)	Cc1.run(2)	LCSPSTM_090	Bm57_2	OK	0.23	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt18)	Cc1.run(2)	LCSPSTM_090	Bm68_2	OK	0.18	uf7.6	API WSD 2014 joint	TAKAT	
K joint(Jt19)	Cc1.run(2)	LCSPSTM_090	Bm76_2	OK	0.25	uf7.6	API WSD 2014 joint	A PRIVIS	
K joint(Jt20)	Cc1.run(2)	LCSPOPT_000					1/	IN LA	
K joint(Jt21)	Cc1.run(2)	LCSPSTM_045	Bm59_2	OK	0.25	uf7.6	API WSD 2014 joint		
K joint(Jt22)	Cc1.run(2)	LCSPSTM_090	Bm76_1	OK	0.19	uf7.6	API WSD 2014 joint		
K joint(Jt23)	Cc1.run(2)	LCSPSTM_090	Bm75_2	OK	0.22	uf7.6	API WSD 2014 joint	Geom OK	
K joint(Jt24)	Cc1.run(2)	LCSPOPT_000	-					PhilPM Philos Park	
/ member (Bm9)	Cc1.run(1)	LCSPOPT_000	0.00	OK	0.20	uf6.13	API WSD 2014 member	Geom OK	
/ member(Bm 10)	Cc1.run(1)	LCSPOPT_000	0.00	OK	0,20	uf6.13	API WSD 2014 member	Geom OK	
/ member(Bm11)	Cc1.run(1)	LCSPOPT_000	0.00	OK	0.20	uf6.13	API WSD 2014 member	Geom OK	
/ member(Bm12)	Cc1.run(1)	LCSPOPT_000	0.00	OK	0.20	uf6.13	API WSD 2014 member	Geom OK	
<pre>/ member(Bm13)</pre>	Cc1.run(1)	LCSPOPT_000	0.00	OK	0.12	uf6.13	API WSD 2014 member	Geom OK	
/ member(Bm14)	Cc1.run(1)	LCSPSTM_090	0.00	OK	0.14	uf6.27	API WSD 2014 member	Geom OK	
/ member(Bm15)	Cc1.run(1)	LCSPSTM_045	0.00	OK	0.18	uf6.27	API WSD 2014 member	Geom OK	
/ member(Bm16)	Cc1.run(1)	LCSPSTM_090	1.00	OK	0.16	uf6.27	API WSD 2014 member	Geom OK	
/ member(Bm17)	Cc1.run(1)	LCSPSTM_090	1.00	OK	0.17	uf6.21	API WSD 2014 member	Geom OK	
member (Bm 18)	Cc1.run(1)	LCSPSTM_000	0.00	OK	0.16	uf6.21	API WSD 2014 member	Geom OK	



Capacity Model	Run	LoadCase	Position	Status	UfTot	Formula	SubCheck	GeomCheck	Idealization Method	-
<pre>/ member(Bm84_6_6)</pre>	Cc1.run(1)	LCSPOPT_000	0.00	Failed(uf)	5.43	ufH1-1	AISC 9th member	Geom OK		
/ member(Bm84_10)	Cc1.run(1)	LCSPOPT_000	0.00	Failed(uf)	2.45	ufH1-1	AISC 9th member	Geom OK		
/ member(Bm85_3_7_1)	Cc1.run(1)	LCSPOPT_000	0.00	Failed(uf)	2.24	ufH1-1	AISC 9th member	Geom OK		
/ member(Bm85_1_2_1)	Cc1.run(1)	LCSPOPT_090	0.00	Failed(uf)	2.22	ufH1-1	AISC 9th member	Geom OK		
/ member(Bm84_7_1)	Cc1.run(1)	LCSPOPT_000	0.80	Failed(uf)	2.16	ufH1-1	AISC 9th member	Geom OK		
/ member(Bm84_6_6_1)	Cc1.run(1)	LCSPOPT_090	0.00	Failed(uf)	2.01	ufH1-1	AISC 9th member	Geom OK		
<pre>/ member(Bm84_6_5_1)</pre>	Cc1.run(1)	LCSPOPT_000	0.83	Failed(uf)	1.99	ufH1-1	AISC 9th member	Geom OK		
/ member(Bm85_3_6)	Cc1.run(1)	LCSPOPT_090	0.00	Failed(uf)	1.91	ufH1-1	AISC 9th member	Geom OK		

Display the code results in color by selecting the model (drag rubberband), RMB clicking and selecting ColorCode > Results > UfTot. Click outside the model to unselect it or else the model will still be selected and therefore red. Select a member of interest, RMB click and select Labels > Results and then select a result of interest, for instance UfTot_LC meaning the usage factor and load combination corresponding to the color.



RMB click a member and select Redesign to open the dialog below in which redesign of the member can be done by selecting e.g. new section or material. The new utilisation (UfTot) of the change will immediately appear. Such a change is, however, based on the assumption that the change will not redistribute any loads. Any detail about the member and results can be found by clicking the Details button to the right.

Run:	Cc1.allRuns			•	Loadase: <a>Worst C	Case (CC)>		•]					
~~	< 1 >	<u>>></u>	Recalculat	e	Full Table	No recalculation d Pressing OK/Appl	y has no ef	fect.						D to 1
Member	Position Range	Position	Section	Material	Buckling Length,Factor	Stiffener Spacing [m]		UfTot	Formula	GeomCheck	SubCheck	Loadcase	Run	Detail
Leg_4_2	-0.00 - 0.09	0.09	Can1 💌	MT_50_KSI	KL(23.2289 m, 1)	• 23.22886136	OK		uf6.21	Geom OK	API WSD 2014 member	LCSPSTM_045	Cc1.run(1)	Details
Leg_4_2	0.09 - 0.93	0.23	Leg1 💌	MT_36_KSI	KL(23.2289 m, 1)	23.22886136	ОК		uf6.21	Geom OK	API WSD 2014 member	LCSPSTM_045	Cc1.run(1)	Details
Leg_4_2	0.93 - 1.00	1.00	Can1 💌	MT_50_KSI	KL(23.2289 m, 1)	23.22886136	OK		uf6.21	Geom OK	API WSD 2014 member	LCSPSTM_045	Cc1.run(1)	Details
•														1



Code check results can also be tabulated for members individually by RMB clicking and selecting Properties followed by clicking the Object Properties tab as shown below.

Cc1.member(Leg_4_2)	Position	Status	UfTot	Formula	GeomCheck	SubCheck	Run
<pre>/ Cc1.run(1).member(Leg_4_2)</pre>	0.00	OK	0.06	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
Options	0.09	OK	0.07	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
🗄 🕒 Loads	0.09	OK	0.19	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
E- Results	0.23	OK	0.20	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
P10.00 - API WSD 2014 member	0.50	OK	0.19	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
P2 0.09 - API WSD 2014 member	0.75	OK	0.14	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1
P3 0.09 - API WSD 2014 member P4 0.23 - API WSD 2014 member	0.93	OK	0.20	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
P5 0.50 - API WSD 2014 member	0.93	OK	0.07	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
P 5 0.30 - API WSD 2014 member P 7 0.93 - API WSD 2014 member P 7 0.93 - API WSD 2014 member P 8 0.93 - API WSD 2014 member P 9 1.00 - API WSD 2014 member	• 1.00	ОК	0.08	uf6.21	Geom OK	API WSD 2014 member	Cc1.run(1)
	4				1		

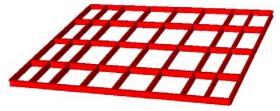
3.5 Create a report of code check results

First create a Dynamic sets.

Under Utilities-> Sets-> Dynamic Sets RMB click and select New Dynamic Set. Name: JacketDeck Plane Type: In Or Above Plane Select Z and input -60m Apply

Select the Top deck main members only and click Alt-S to show these members only.

	 Jacket 						
Plar	Plane ne type: I X Y	Or Above	Plane	•	Ċ		
	ZCoord:			m			
I▼ Pre	view			c	к	Cancel	Apply



Create another Dynamic Set.

Under Utilities-> Sets-> Dynamic Sets RMB click and select New Dynamic Set. Name: Top_Deck Plane Type: In Plane Select 3-point and select the 3 outside points of the deck Apply

Box Plane	String Line Not And Or
Plane type:	In Plane
x] ı	r Z Point/Vector 3-Point
Point1:	Point(-12.5 m,-11 m,24 m) 🔍 m
Point2:	Point(12.5 m,-11 m,24 m) 🔍 m
Point3:	Point(12.5 m, 11 m, 24 m) 🛐 m

To Create the report use File > Save report to open the dialog below and select FEM Results then "Add Selected", Select Graphics then "Add Selected", Select Graphics again then "Add Selected", and Select Frame Code Check then "Add Selected" to put these results only into the report.

DNV	
Report	
Define Report Name Jacket_Pile_Soil_Analysis	Journal report generation Create Cancel
Jacket_Pile_Soil_Analysis	Report Title Jacket_Pile_Soil_Analysis
	Available Chapters: Structure Properties Masses
	Loado FEM Res Intel Frame Code Check Plate ruber check Graphics

Clicking Add Selected puts several types of results into the field to the left. These will be chapters in the report. The selection of results to put into the report may be further refined by checking only certain boxes as shown. Moreover, only a selection of load combinations may be included. Limit the amount of data in the report to avoid an excessively large report demanding a long time to be created!

Under FEM Results: Check "FEM Beam Force" & "FEM Beam Stress". For Loadcases select "LCSPSTM_090"

Define	Report				
Name	Jacket_Pile_Soil_Analysis	Jou 🗸 🗸	rnal report generation Create	Cancel	
		Loadcase and Struc Analysis: Analysis Loadcases: All Load Structure: No Loop	si	8? elect	
	FEM Node Reaction	Positions (for Bear	Select Loads and Sets	-	
	FEM Beam Force	Number of fixed p	Loop Sets V Loop Loadcases	1	S
	Graphics	Hotspot (for Bean Worst hotspo	Capacity Manager None Runs		8
	✓ III Summary Results	Abs Max	Analysis Analysis 1	Description	All
	Member Loads	C All hotspots	Load Case	Description Reference to Loa	None
	Member Result Brief	 All notspots 	LCSPOPT_000	LoadCombination	None
		Shape (for Beam	EMILCSPOPT_045 MILCSPOPT_090	LoadCombination	
	Joint Member Loads	C Linear	LCSPSTM_000	LoadCombination	
	Joint Result Full	Number of interpo	BIL CSPSTM 045	LoadCombination	
			ELCSPSTM_090	LoadCombination 👻	
			<u>•</u>		
			Structure selection		· 72
			Set	Description	8
			Deck	Regular Set Regular Set	All
•			Jacket_Deck	Regular Set	None
C			JacketDeck	Dynamic Set	
Save R Report	format: Html 🔻		Piles Op Deck	Regular Set Dynamic Set	
File na	me: Jacket_Pile_Soil_Analysis			o ynanie oet	
		-	×I	•	
				ОКС	ancel

Under Graphics: Check Loop Sets and check Jacket_Deck.

Under Figure: Display- Capacity Models, Background- Paper, View- Auto, Color Coding- Results, Name- UfTot, Labels- None



Define Report Name Jacket_Pile_Soil_Analysis	Journal report gener		Define Report Name Jacket_Pile_Sol_Analysis	Journal report generation Create Cancel
Locket Pile Sol Analysis Field Rearlis Field Rearlis	Chapter Name: Graphics Loop Loadcases Analysis selecton Capacity Manager None Runs Analysis 1 Load Case Analysis 1 Load Case Analysis 1 Load Case Banalysis 1.WLC(1, 1) Analysis 1.WLC(2,	Very load condi Wave load condi Wave load condi Wave load condi Wave load condi Wave load condi Reference lo Los		Redstrond: Paper Color Codes Color Codes Coder Codes
Save Report Report format: Html File name: Jacket_Pile_Sol_Analysis	Save	iew	Save Report Report format: Html File name: Jacket_Pile_Sol_Analysis	Save View

Under Graphics: Check Loop Sets and check Top_Deck.

Under Figure: Display- Capacity Models, Background- Paper, View- Auto, Color Coding- Results, Name- UfTot, Labels- Apply To: Capacity Members, Labels Type- UfTot

ame Jacket Pile Soil Analysis	▼ Journal report gener	ation Modify Ca	ncel Define Report Name Jacket_Pile_Soil_Analysis	s 🗸 🔽 Journal report generation	Modify Cancel
Jacket, Pie, Sol, Analysis Jacket, Pie, Sol, Analysis PHR Results Phere Results PHR Results Phere Phere Results Phere P	Chapter Name: Graphics Chapter Name: Graphics Chapter Name: Graphics Capacity Manager Nuone Runs Runs Runs Runs Runs Runs Runs Runs	New F Worst Loadcase		Alysia Four Name: Four Pares Fou	
•	<u>.</u>	>		•	

Under Frame Code Check: Check "Member Result Brief", "Joint Member Loads", & "Joint Result Brief". Check Worse Loadcase and Worst Position.



Name Ja	acket_Pile_Soil_Analysis	-	🔽 Journal report ge	neration	Create	Cancel
	Jacket_Pile_Soil_Analysis	☐ Select	Resultcases			،
₿-E	FEM Results FEM Beam Force Envel	Analysis				
	FEM Beam Stress Enve	Capacity	Manager Cc1		*	8
	FEM Beam Displacemen		Cc1.allRuns (Represer	nts all the rur	ns in a capaci 🔻	All
	FEM Modal Mass Facto	Analysis	Analysis1		Ψ.	
	FEM Node Reaction	Load Cas	e	Des	cription	All
	FEM Beam Force		SPOPT_000		Combination	None
	FEM Beam Stress		CSPOPT_045		Combination	
	FEM Beam Displacemer		SPOPT_090	Loon	Combination	
	Graphics		CSPSTM_000 CSPSTM_045		Combination	
	Frame Code Check		CSPSTM_090		Combination	
	Member Loads					
	Ioint Member Options				•	
	Joint Member Loads		mbers/Joints ted Members/Joints			8
			Inint Peculty			
		UfTot	Loadcase	I✓ Wor	st Position	
		Lower				
		[Upper				
1	•					
		l:				

Click first Save and then View. The report will open in a web browser, Word or Excel depending on the chosen report format.

An extract of the word formatted report is shown below.

1.2.1 LCSPS	TM_090	: FEM Bea	m Force							C
LCSPSTM_0	90 : FEN	l Beam Foi	rce							
- Sorted by Name	e (Ascending)								
- Analysis : Analy	sis1									
Parameters : Name : Name of I Position : Position Length [m] : Dista NXX [kN] : Axial fc NXY [kN] : Shear MXX [kN*m] : Shear MXX [kN*m] : Tor MXY [kN*m] : Ben Comment : Comm	relative to en nce from enco orce (Positive force in local force in local sional mome ding momen ding momen	I1 of beam gives tension) Y-direction (Po Z-direction (Po nt (Positive pro t about local Y	ositive rotates ositive rotates duces a righ -axis (Positive	an isolated p t-handed scre e gives tensio	iece anti-clock w) n at local nega	wise when viewe tive Z-axis side o	d in direction of f profile)			
Name	Position	Length [m]	NXX [kN]	NXY [kN]	NXZ [kN]	MXX [kN*m]	MXY [kN*m]	MXZ [kN*m]	Comment	
Bm9	0.00	0.0127116	105.114	-6.71255	10.7017	34.7298	53.5741	-84.1113	Max MXY	
	1.00	12.6981	105.114	38.9787	3.92717	34.7298	-39.2123	120.543	Max MXZ	
Bm10	0.00	0.0112116	37.8345	20.3005	35.5341	-8.48591	289.659	-152.248	Min MXZ, Max MXY	
Bm11	0.00	0.0112116	64.37	-20.5897	34.3929	8.72961	277.226	154.548	Max MXZ, Max MXY	
Bm12	0.00	0.0127116	-144.851	-8.85257	11.6868	26.8818	54.4693	-85.4178	Max MXY	
	1.00	12.6981	-144.851	40.5494	4.74982	26.8818	-49.7831	115.626	Max MXZ	
Bm13	0.00	0.0104108	396.5	-2.06896	0.394093	11.3113	6.58836	-129.312	Max MXY	
	1.00	10.4004	396.5	54.6064	1.10258	11.3113	-1.18683	143.62	Max MXZ	
Bm14	0.00	0.00891079	-7.08543	34.4275	12.0615	-5.65884	82.815	-213.6	Min MXZ, Max MXY	



	Name	Position	Length [m]	Algo	Compo	Hotspot	VonMises [KPa]	Sigxx [KPa]	SigNxx [KPa]	SigMxy [KPa]	SigMxz [KPa]	TauMxx [KPa]	TauNxy [KPa]	TauNxz [KPa]	Comment	=
١.	Bm9	1.00	12.7107	AbsMax	VonMises	12	18620.5	18134.9	2364.04	1261.16	14509.7	2155.15	454.312	-170.338	Worst	
		1.00	12.7107	Min	sigxx	24	14056.7	-13406.8	2364.04	-1261.16	-14509.7	2155.15	-454.312	170.338	Worst	
		1.00	12.7107	Max	sigxx	12	18620.5	18134.9	2364.04	1261.16	14509.7	2155.15	454.312	-170.338	Worst	
	Bm10	0.00	0.000112108	AbsMax	VonMises	21	41498.6	41488.2	850.91	31175.6	9461.74	-526.592	-790.795	799.306	Worst	¥.
		0.00	0.000112108	Min	sigxx	9	39797.2	-39786.4	850.91	-31175.6	-9461.74	-526.592	790.795	-799.306	Worst	0
		0.00	0.000110100	Mos	ninwy	21	A1400 C	A1400 0	10.039	21175.6	0461 74	606 600	700 705	700 206	Mont	

2 Graphics

2.1 Figure Jacket Deck

19 Oct 2017 10:23 GeniEActivity1 Analysis1

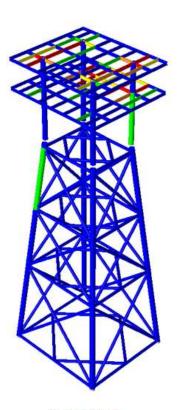




Figure (Set Jacket Deck.)

0

DNV 8.1 Figure Top Deck											
15 Jul 2016 09:33 GeniEActivity4 Analysis1											
		0.09	0.08	0.08	0.13	0.15	0.36	0.33	0.26		
	0.15	0.47	0.70	0.41	0.14	0.47	2.01	0.89	0.27		
		0.19	0.71	0.95	0.41	0.41	1.31	2.24	0.44		
	0.15	0.57	1.47	0.50	0.16	0.60	1.99	1.06	0.36		
		0.27	0.42	0.45	0.16	0.16	0.45	0.42	0.28		
	0.36	0.98	1.60	0.51	0.16	0.38	1.06	0.49	0.14		
		0.43	2.22	1.24	0.41	0.41	0.82	0.67	0.19		
	0.28	0.85	2.16	0.41	0.14	0.34	0.85	0.41	0.14		
		0.26	0.35	0.38	0.19	0.16	0.11	0.08	0.10	UfTot	
×										<pre><0.01 >= 0.01 >= 0.5 >= 0.8 >= 1 >= 1.33</pre>	
				1	Figure <u>(Set</u>	Top_Deck)					

3.6 Redesign

In the capacity model click on Cc1.run(1) and select a member with the highest UfTot (5.62).

Create a new section W40x179 (from library). We will use this section for redesign of the worst UfTot member. RMB click on the respective beam and choose Redesign. Properties box will be prompted:

	un 1 (Member ulation history -				Loadase: <mark>< Worst C</mark>	Update Membe	rs From Struc	ture				
		<u> </u> >>	 Automatic Recalculate 	£	E-III T-M-	Section/material/ of sync. If this is of push "Update Mer	ue to modifica	ations in	the structure	e model		
/ <mark>lemb</mark> er	Position Range	Position	Section	Material	Buckling Length,Factor	Stiffener Spacing [m]	Status	UfTot	Formula	GeomCheck	SubCheck	Loadcase
3m159	-0.00 - 1.00	0.00	W30X124	MT_50_KSI	▼ KL(2.5 m, 1)	2.5	Failed(uf)	5.62	ufH1-1	Geom OK	AISC 9th member	LCSPOPT_090

Change the section to W40x149. Notice that the UfTot is now reduced to a new estimation value.



Run: 🖪	un 1 (Member	Code Check	()	▼ Lo	oadase: <mark><worst cas<="" mark=""></worst></mark>	e (CC)>		-				
Recalci	< 2 >	»	 Automatic R Recalculate 	lecalculate 🔽 C	Colorcode UFtot Se	Update Member ection/material/t sync. If this is d ush "Update Mer	ouckling prop ue to modifica	erty of be ations in	the structure	e model		
mber	Position Range	Position	Section	Material	Buckling Length,Factor	Stiffener Spacing [m]	Status	UfTot	Formula	GeomCheck	SubCheck	Loadcase
159	-0.00 - 1.00	0.00	W40X149 👱	MT_50_KSI	KL(2.5 m, 1) 💌	2.5	Failed(uf)	3.97	ufH1-1	Geom OK	AISC 9th member	LCSPOPT_090

Click OK. Then RMB on Cc1 and click on Run All. Click OK when prompted with Update Structure From Members. This will update the structure with respect to the redesigned section.

Update Structu	ire From Members		
🔽 Update Mat	terial and Section Proper	ties <mark>8</mark> ?	
	123		
Update Buc	kling Data from Run 💡	?	
Alter and the second second	kling Data from Run 💡	?	T
Alter and the second second	ng Tanan di kana da kata 1988	? Cancel	Ŧ

Check the result and decide whether further redesign is needed or not.

3.7 Save the model

GeniE workspace can be saved using CTRL+S or File > Save Workspace. It is also advisable to back up the model by exporting them into GNX and XML format.



About DNV

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.