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Rondebosch
Cape Town
7442
Tel: 065 144 9562



CHAMDOR TOTALGAZ DEPOT LPG TRANSFER PUMP SUCTION PIPEWORK

Piping Stress & Flexibility Analysis

Analysis as per B31.3 2020

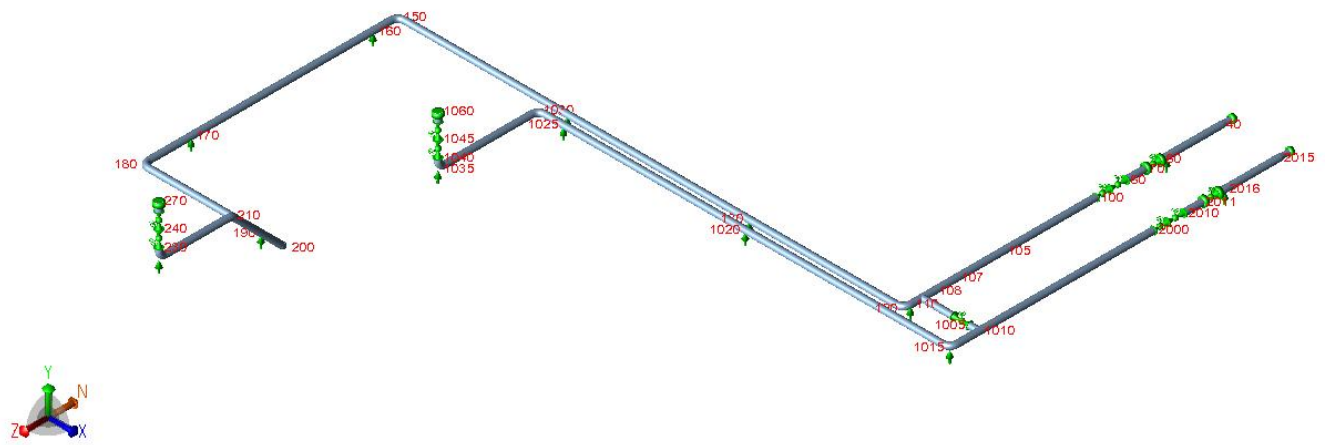
XGM Consulting Engineers South Africa
REPORT No: 1650-SA-01

DRAWING No. 1650-2-311

28 AUGUST 2022

CONTAINED IN THIS DOCUMENT

1. CODE COMPLIANCE REPORT	pg 6
2. DISPLACEMENT REPORT	pg 20
3. RESTRAINT SUMMARY	pg31
4. STRESSES	pg36



CHAMDOR DEPOT LPG

DESIGN PRESSURE / LINE SIZE: 80NB, 100NB

TEST PRESSURE: 3830 KPa

DESIGN TEMPERATURE: 38 Deg C

OPERATING MEDIUM: LPG

SANS 347 Hazard Category: II

Piping

4.4.4.1 Dangerous gas

Piping that is intended for unstable gases that fall within categories I or II shall be classified as category III.

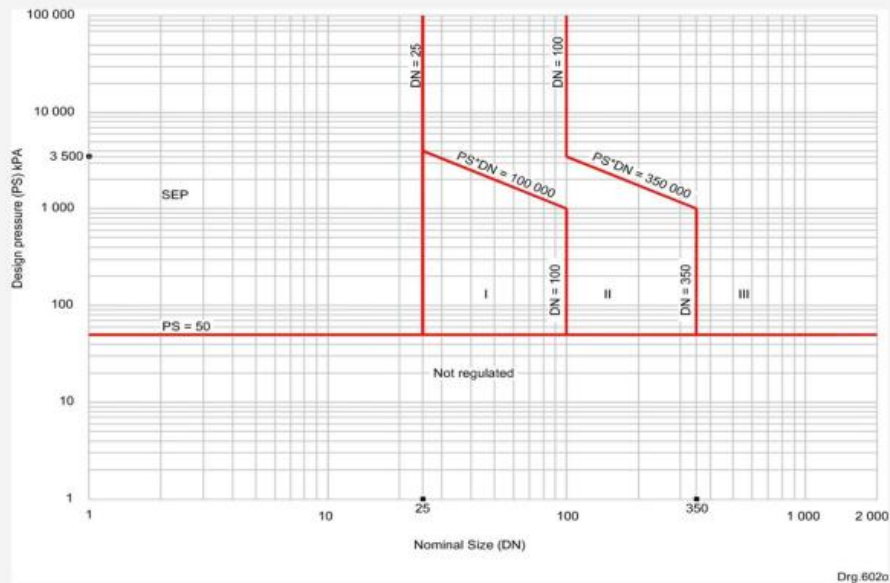
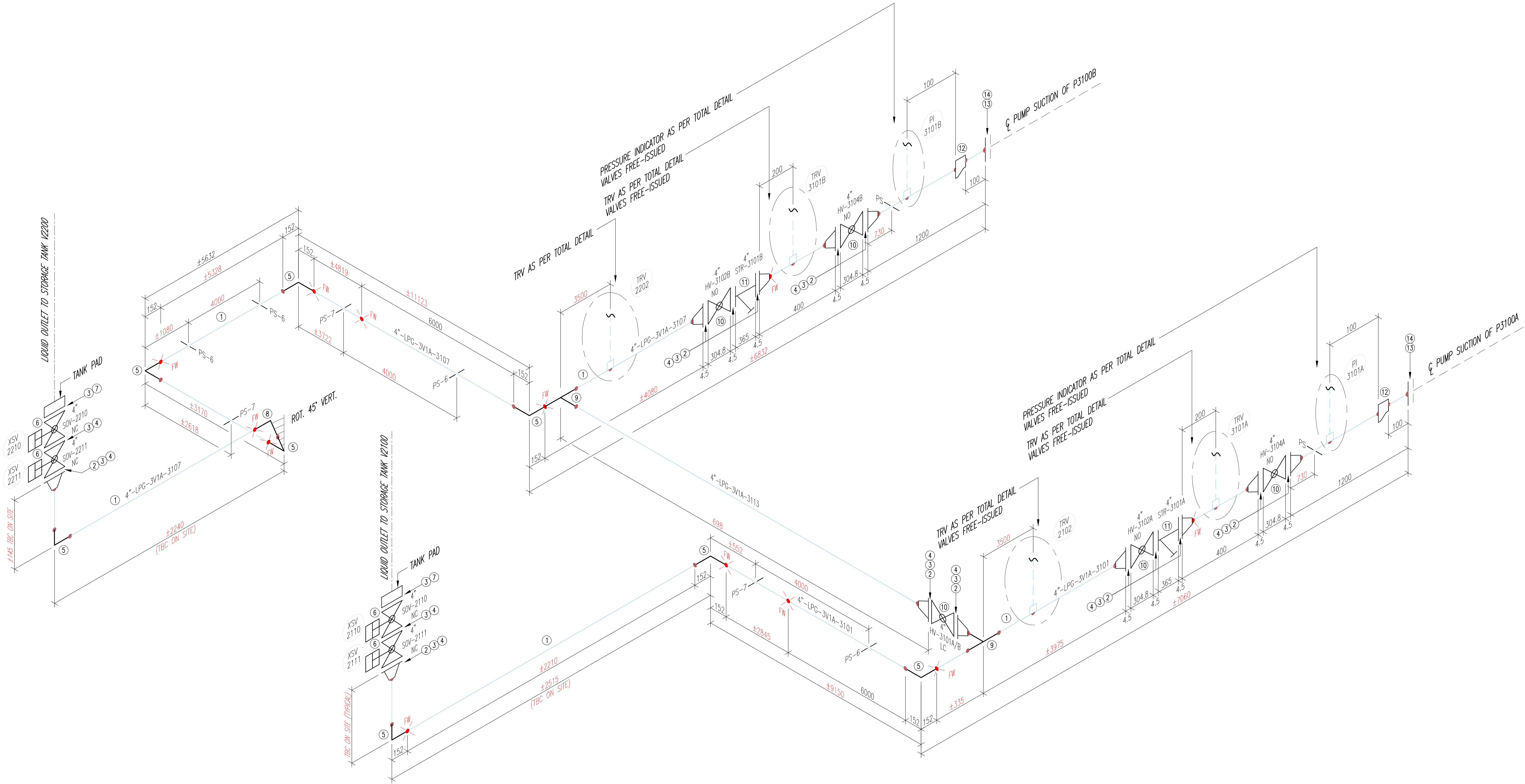


Figure 6 — Graph for piping — Dangerous gas

REPORT PREPARED FOR: MAJ PROJECTS

COMPILED BY: LE GREEN (PrTechEng)

DO NOT SCALE-IF IN DOUBT ASK						
MATERIAL LIST						
ITEM No.	QTY.	SIZE	RTG/ SCH	DESCRIPTION	REV.	No.
1		100NB	80	PIPE SMLS CS A333 GR.6		
2		100NB	300#	FLANGE WN CL RF CS A350 ORLP2 CL1 ASME B16.5		
3		100NB	300#	GASKET SPIRAL WOUND 316L/304WITE C/1 4.5mm THK - FRESATE		
4		N20x120	300#	BOLTS 1/2"X INCHEN C/W 2 NUTS & WASERS CS A307 GR1 ASME B11.1		
5		100NB	80	ELBOW 90 DEG LR SMLS CS A307 WPL6 ASME B16.9		
6		100NB	300#	PNEUMATIC ACTUATED BALL VALVE (FREE ISSUED)		
7		N20x110	300#	BOLTS 1/2"X INCHEN C/W 2 NUTS & WASERS CS A307 GR1 ASME B11.1		
8		100NB	80	ELBOW 45 DEG LR SMLS CS A307 WPL6 ASME B16.9		
9		100NB	80	EQUAL TEE SMLS CS A307 WPL6 ASME B16.9		
10		100NB	300#	BALL VALVE FB FLANGED (FREE ISSUED)		
11		100NB	300#	T-TYPE STRAINER (FREE ISSUED)		
12		100NB/80NB	300#	REDUCER ECCENTRIC (TTS) SMLS CS A307 WPL6 ASME B16.9		
13		80NB	300#	SQUARE FLANGE AND BOLTS (PUMP SUPPLIERS)		
14		80NB	300#	GASKET SPIRAL WOUND 316L/304WITE C/1 4.5mm THK - FRESATE		

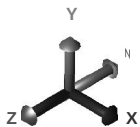
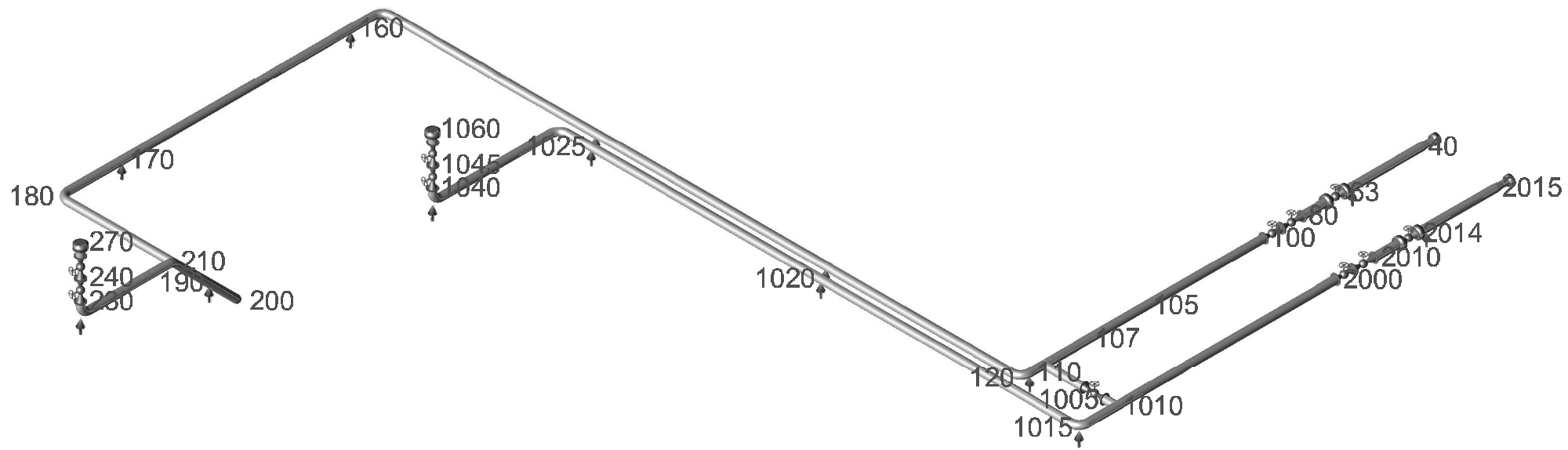


NOTE:
1) ALL DIMENSIONS TO BE VERIFIED ON-SITE
2) PLEASE REFER TO DRG 1650-2-100 FOR SITE PLAN DETAILS
3) PLEASE REFER TO DRG 1650-2-305 FOR GENERAL ARRANGEMENT DETAILS

GENERAL NOTES		SANS 347	HIGHEST HAZARD CATEGORY	II	LEGEND
1. WELDRODS FOR ROOT AND FILLER RUNS AND FOR CAPPING SEE OCP		Declaration by Piping Designer (APPROVED FOR CONSTRUCTION): The piping design shown in this revision of this drawing complies with ASME B31.3 (2014) and SANS 347 (2012).			AC - ABOVE GRADE
2. RADIOGRAPHY...SEE OCP		Signature: B.SOUTH	Name: B.SOUTH	Date: SEP. 2021	BE - BEVELLED END
3. PAINTING TO PAINT PROCEDURE SEE SPECIFICATIONS		Reg. No. 7996			BF - BOTTOM FLAT
4. WELDING PROCEDURE SPEC. SEE OCP		Third Party Inspector The piping design shown in this revision of this drawing complies with SANS 347.			BOP - BOTTOM OF PIPE
5. FOR PIPE DIMENSIONS REFER TO PIPE C, U.O.S		Signature: _____	Name: _____	Date: _____	TBE - THREADED BOTH ENDS
6. FOR PIPE ELEVATIONS REFER TO B.O.P., U.O.S (IF APPLICABLE)					TE - THREADED END
6. CHECK ALL DIMENSIONS PRIOR TO FABRICATION.					TF - TOP FLAT
7. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER PRIOR TO FABRICATION.					TOE - THREADED ONE END
					VERT - VERTICAL PLANE
					WN - WELDING NECK
					FW - FIELD FIT WELD
					FLG - FLANGE
					PE - PLAIN END
					----- NEW PIPING
					----- EXISTING PIPING
					----- REFERENCE LINE

PIPE SUPPORT DETAILS									
PIPE SUPPORT NUMBER	PS-1	PS-2	PS-3	PS-4	PS-5	PS-6	PS-7	PS-8	PS-9
RC BASE TYPE	FS	LCS	FS	LCS	FS	FS	LCS	FS	H5
PIPE SUPPORT TYPE	001	002	001	001	002	001	002		
STD MS CIV 121	S3	S3	S1	S2	S2	S3	S1		
WIDTH									
PIPE SHOE	033	035	033	033	035	033	035	003	041/042
STD MS PW 002									
NOTE: FOR PIPE SUPPORT DESIGN DETAILS, REFER TO TOTALENERGES STANDARDS: 1 - STD MS CIV 121 2 - STD MS PW 002									

SERVICE LPG		DES. TEMP °C 38	
TEST PRESS. 32.30 kPa G		DES. PRESS. 258.3 kPa G	
01	ISSUED FOR CONSTRUCTION		TM 13/01/22
REV	REVISIONS		APRV DATE
CLIENT			
			
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APPROVED: MJ	FEB 2022	VIEW: 	
ISSUED FOR CONSTRUCTION			
PROJECT CHAMDOR DEPOT LPG PIPELINE REPLACEMENT LPG TRANSFER PUMP SUCTION PIPEWORK – ISOMETRIC			
INITIALS		DATE	SIZE: A0
DESIGNED: BS	FEB 2022	SCALE: N.T.S.	
DRAWN: HR	FEB 2022	SHEET: 1 OF 1	
APPROVED: MJ	FEB 2022	VIEW: 	
ISSUED FOR CONSTRUCTION			
PROJECT CHAMDOR DEPOT LPG PIPELINE REPLACEMENT LPG TRANSFER PUMP SUCTION PIPEWORK – ISOMETRIC			
INITIALS		DATE	SIZE: A0
DESIGNED: BS	FEB 2022	SCALE: N.T.S.	
DRAWN: HR	FEB 2022	SHEET	



CODE COMPLIANCE REPORT

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
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Table of Contents

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS..... 2
Code Compliance : Multiple 3

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
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LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS

- 1 (OPE) W+T1+P1
- 2 (Alt-SUS) W+P1
- 3 (SUS) W+P1
- 4 (EXP) L4=L1-L3

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

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CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

LOAD CASE DEFINITION KEY

CASE 1 (OPE) W+T1+P1

CASE 3 (SUS) W+P1

CASE 4 (EXP) L4=L1-L3

Note: For a complete breakdown of code-defined stress components, see the Stresses report.
Piping Code: B31.3 = B31.3 -2016, Jan 31, 2017

*** CODE COMPLIANCE EVALUATION PASSED ***

Highest Stresses: (KPa)
 Ratio (%): 26.8 @Node 100 LOADCASE: 3 (SUS) W+P1
 Code Stress: 36951.7 Allowable Stress: 137895.1
 Axial Stress: 6858.2 @Node 220 LOADCASE: 3 (SUS) W+P1
 Bending Stress: 30213.9 @Node 100 LOADCASE: 3 (SUS) W+P1
 Torsion Stress: 4446.9 @Node 110 LOADCASE: 3 (SUS) W+P1
 Hoop Stress: 14662.5 @Node 40 LOADCASE: 1 (OPE) W+T1+P1
 Max Stress Intensity: 36951.7 @Node 100 LOADCASE: 3 (SUS) W+P1

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	10	0.0	0.0	0.0	20	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	20	4967.8	0.0	0.0	30	5280.3	0.0	0.0	B31.3	
3(SUS)		4967.8	137895.1	3.6		5280.3	137895.1	3.8	B31.3	
4(EXP)		0.0	339770.1	0.0		0.0	339457.5	0.0	B31.3	
1(OPE)	30	5280.3	0.0	0.0	40	7190.3	0.0	0.0	B31.3	
3(SUS)		5280.3	137895.1	3.8		7190.3	137895.1	5.2	B31.3	
4(EXP)		0.0	339457.5	0.0		0.0	337547.5	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements

Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	40	7190.3	0.0	0.0	50	12034.1	0.0	0.0	B31.3	
3(SUS)		7190.3	137895.1	5.2		12034.1	137895.1	8.7	B31.3	
4(EXP)		0.0	337547.5	0.0		0.0	332703.8	0.0	B31.3	
1(OPE)	50	12034.1	0.0	0.0	60	8370.6	0.0	0.0	B31.3	
3(SUS)		12034.1	137895.1	8.7		8370.6	137895.1	6.1	B31.3	
4(EXP)		0.0	332703.8	0.0		0.0	336367.2	0.0	B31.3	
1(OPE)	60	0.0	0.0	0.0	63	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	63	0.0	0.0	0.0	66	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	66	0.0	0.0	0.0	70	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	70	17487.2	0.0	0.0	80	28219.4	0.0	0.0	B31.3	
3(SUS)		17487.3	137895.1	12.7		28219.4	137895.1	20.5	B31.3	
4(EXP)		0.0	327250.6	0.0		0.0	316518.4	0.0	B31.3	
1(OPE)	80	0.0	0.0	0.0	90	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	90	0.0	0.0	0.0	100	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	100	36951.6	0.0	0.0	105	27653.1	0.0	0.0	B31.3	
3(SUS)		36951.7	137895.1	26.8		27653.3	137895.1	20.1	B31.3	
4(EXP)		0.1	307786.2	0.0		0.2	317084.6	0.0	B31.3	
1(OPE)	105	27653.1	0.0	0.0	107	18133.6	0.0	0.0	B31.3	
3(SUS)		27653.3	137895.1	20.1		18133.8	137895.1	13.2	B31.3	
4(EXP)		0.2	317084.6	0.0		0.2	326604.0	0.0	B31.3	
1(OPE)	107	18133.6	0.0	0.0	108	12156.3	0.0	0.0	B31.3	
3(SUS)		18133.8	137895.1	13.2		12156.5	137895.1	8.8	B31.3	
4(EXP)		0.2	326604.0	0.0		0.2	332581.3	0.0	B31.3	
1(OPE)	108	12156.3	0.0	0.0	109	8863.2	0.0	0.0	B31.3	
3(SUS)		12156.5	137895.1	8.8		8863.5	137895.1	6.4	B31.3	
4(EXP)		0.2	332581.3	0.0		0.3	335874.3	0.0	B31.3	
1(OPE)	109	15913.5	0.0	0.0	1000	10169.7	0.0	0.0	B31.3	
3(SUS)		15794.2	137895.1	11.5		9587.1	137895.1	7.0	B31.3	
4(EXP)		4.9	328943.6	0.0		4.5	335150.8	0.0	B31.3	
1(OPE)	1000	0.0	0.0	0.0	1005	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	1005	12836.0	0.0	0.0	1010	13067.1	0.0	0.0	B31.3	
3(SUS)		12606.1	137895.1	9.1		12851.1	137895.1	9.3	B31.3	
4(EXP)		4.9	332131.7	0.0		5.3	331886.7	0.0	B31.3	
1(OPE)	1010	12953.5	0.0	0.0	2000	31576.9	0.0	0.0	B31.3	
3(SUS)		12957.4	137895.1	9.4		31578.0	137895.1	22.9	B31.3	
4(EXP)		3.9	331780.5	0.0		1.1	313159.8	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements

Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	2000	0.0	0.0	0.0	2005	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	2005	0.0	0.0	0.0	2010	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	2010	21186.8	0.0	0.0	2011	9464.8	0.0	0.0	B31.3	
3(SUS)		21187.4	137895.1	15.4		9465.2	137895.1	6.9	B31.3	
4(EXP)		0.6	323550.4	0.0		0.4	335272.7	0.0	B31.3	
1(OPE)	2011	0.0	0.0	0.0	2013	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	2013	0.0	0.0	0.0	2014	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	2014	0.0	0.0	0.0	2012	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	2012	18941.2	0.0	0.0	2016	23328.8	0.0	0.0	B31.3	
3(SUS)		18941.1	137895.1	13.7		23328.8	137895.1	16.9	B31.3	
4(EXP)		0.1	325796.7	0.0		0.0	321409.1	0.0	B31.3	
1(OPE)	2016	23328.8	0.0	0.0	2015	13558.3	0.0	0.0	B31.3	
3(SUS)		23328.8	137895.1	16.9		13558.3	137895.1	9.8	B31.3	
4(EXP)		0.0	321409.1	0.0		0.0	331179.5	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	2015	13558.3	0.0	0.0	2020	15794.5	0.0	0.0	B31.3	
3(SUS)		13558.3	137895.1	9.8		15794.5	137895.1	11.5	B31.3	
4(EXP)		0.0	331179.5	0.0		0.0	328943.4	0.0	B31.3	
1(OPE)	2020	15794.5	0.0	0.0	2025	14757.3	0.0	0.0	B31.3	
3(SUS)		15794.5	137895.1	11.5		14757.3	137895.1	10.7	B31.3	
4(EXP)		0.0	328943.4	0.0		0.0	329980.5	0.0	B31.3	
1(OPE)	2025	0.0	0.0	0.0	2030	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	2030	14065.4	0.0	0.0	2035	4838.2	0.0	0.0	B31.3	
3(SUS)		14065.4	137895.1	10.2		4838.2	137895.1	3.5	B31.3	
4(EXP)		0.0	330672.4	0.0		0.0	339899.7	0.0	B31.3	
1(OPE)	1010	13846.8	0.0	0.0	1013	12803.7	0.0	0.0	B31.3	
3(SUS)		12222.3	137895.1	8.9		10023.2	137895.1	7.3	B31.3	
4(EXP)		8.8	332515.5	0.0		11.0	334714.7	0.0	B31.3	
1(OPE)	1013	12884.7	0.0	0.0	1014	15101.1	0.0	0.0	B31.3	
3(SUS)		10023.2	137895.1	7.3		13409.0	137895.1	9.7	B31.3	
4(EXP)		13.4	334714.7	0.0		12.2	331328.8	0.0	B31.3	
1(OPE)	1014	15101.1	0.0	0.0	1015	16803.9	0.0	0.0	B31.3	
3(SUS)		13409.0	137895.1	9.7		14806.7	137895.1	10.7	B31.3	
4(EXP)		12.2	331328.8	0.0		11.6	329931.2	0.0	B31.3	
1(OPE)	1015	15085.9	0.0	0.0	1020	11902.2	0.0	0.0	B31.3	
3(SUS)		14806.7	137895.1	10.7		11274.1	137895.1	8.2	B31.3	
4(EXP)		11.5	329931.2	0.0		11.3	333463.8	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	1020	11902.2	0.0	0.0	1025	11124.7	0.0	0.0	B31.3	
3(SUS)		11274.1	137895.1	8.2		10276.4	137895.1	7.5	B31.3	
4(EXP)		11.3	333463.8	0.0		11.6	334461.4	0.0	B31.3	
1(OPE)	1025	11124.7	0.0	0.0	1028	9978.3	0.0	0.0	B31.3	
3(SUS)		10276.4	137895.1	7.5		8113.5	137895.1	5.9	B31.3	
4(EXP)		11.6	334461.4	0.0		11.3	336624.3	0.0	B31.3	
1(OPE)	1028	10023.1	0.0	0.0	1029	10095.6	0.0	0.0	B31.3	
3(SUS)		8113.5	137895.1	5.9		9156.0	137895.1	6.6	B31.3	
4(EXP)		11.3	336624.3	0.0		12.5	335581.9	0.0	B31.3	
1(OPE)	1029	10095.6	0.0	0.0	1030	9758.2	0.0	0.0	B31.3	
3(SUS)		9156.0	137895.1	6.6		9169.5	137895.1	6.6	B31.3	
4(EXP)		12.5	335581.9	0.0		13.0	335568.3	0.0	B31.3	
1(OPE)	1030	9180.0	0.0	0.0	1033	7014.7	0.0	0.0	B31.3	
3(SUS)		9169.5	137895.1	6.6		7015.5	137895.1	5.1	B31.3	
4(EXP)		10.5	335568.3	0.0		0.8	337722.3	0.0	B31.3	
1(OPE)	1033	7148.8	0.0	0.0	1034	6906.8	0.0	0.0	B31.3	
3(SUS)		7046.9	137895.1	5.1		6873.2	137895.1	5.0	B31.3	
4(EXP)		1.2	337690.9	0.0		0.4	337864.6	0.0	B31.3	
1(OPE)	1034	6906.8	0.0	0.0	1035	6794.2	0.0	0.0	B31.3	
3(SUS)		6873.2	137895.1	5.0		6794.4	137895.1	4.9	B31.3	
4(EXP)		0.4	337864.6	0.0		0.1	337943.5	0.0	B31.3	
1(OPE)	1035	6006.9	0.0	0.0	1040	6010.5	0.0	0.0	B31.3	
3(SUS)		6006.9	137895.1	4.4		6010.5	137895.1	4.4	B31.3	
4(EXP)		0.0	338731.0	0.0		0.0	338727.3	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

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Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	1040	0.0	0.0	0.0	1045	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	1045	0.0	0.0	0.0	1050	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	1050	6689.4	0.0	0.0	1055	6697.1	0.0	0.0	B31.3	
3(SUS)		6689.4	137895.1	4.9		6697.1	137895.1	4.9	B31.3	
4(EXP)		0.0	338048.4	0.0		0.0	338040.7	0.0	B31.3	
1(OPE)	1055	0.0	0.0	0.0	1060	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	109	16654.4	0.0	0.0	110	16320.8	0.0	0.0	B31.3	
3(SUS)		14242.3	137895.1	10.3		13621.0	137895.1	9.9	B31.3	
4(EXP)		4.6	330495.5	0.0		5.5	331116.8	0.0	B31.3	
1(OPE)	110	16667.4	0.0	0.0	119	17436.7	0.0	0.0	B31.3	
3(SUS)		13621.0	137895.1	9.9		15292.1	137895.1	11.1	B31.3	
4(EXP)		6.7	331116.8	0.0		6.6	329445.7	0.0	B31.3	
1(OPE)	119	17436.7	0.0	0.0	120	16642.1	0.0	0.0	B31.3	
3(SUS)		15292.1	137895.1	11.1		14706.8	137895.1	10.7	B31.3	
4(EXP)		6.6	329445.7	0.0		5.6	330031.1	0.0	B31.3	
1(OPE)	120	14871.5	0.0	0.0	130	9401.9	0.0	0.0	B31.3	
3(SUS)		14706.8	137895.1	10.7		8223.1	137895.1	6.0	B31.3	
4(EXP)		5.4	330031.1	0.0		5.1	336514.7	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	130	9401.9	0.0	0.0	140	12880.9	0.0	0.0	B31.3	
3(SUS)		8223.1	137895.1	6.0		12618.7	137895.1	9.2	B31.3	
4(EXP)		5.1	336514.7	0.0		5.2	332119.2	0.0	B31.3	
1(OPE)	140	12880.9	0.0	0.0	148	9178.0	0.0	0.0	B31.3	
3(SUS)		12618.7	137895.1	9.2		7488.1	137895.1	5.4	B31.3	
4(EXP)		5.2	332119.2	0.0		12.9	337249.7	0.0	B31.3	
1(OPE)	148	9190.3	0.0	0.0	149	9690.2	0.0	0.0	B31.3	
3(SUS)		7488.1	137895.1	5.4		8826.2	137895.1	6.4	B31.3	
4(EXP)		15.5	337249.7	0.0		13.6	335911.6	0.0	B31.3	
1(OPE)	149	9690.2	0.0	0.0	150	10562.2	0.0	0.0	B31.3	
3(SUS)		8826.2	137895.1	6.4		9829.5	137895.1	7.1	B31.3	
4(EXP)		13.6	335911.6	0.0		13.5	334908.4	0.0	B31.3	
1(OPE)	150	9835.1	0.0	0.0	160	11932.9	0.0	0.0	B31.3	
3(SUS)		9829.5	137895.1	7.1		11931.2	137895.1	8.7	B31.3	
4(EXP)		13.1	334908.4	0.0		12.7	332806.7	0.0	B31.3	
1(OPE)	160	11932.9	0.0	0.0	170	11529.9	0.0	0.0	B31.3	
3(SUS)		11931.2	137895.1	8.7		11401.5	137895.1	8.3	B31.3	
4(EXP)		12.7	332806.7	0.0		123.3	333336.3	0.0	B31.3	
1(OPE)	170	11529.9	0.0	0.0	178	7543.6	0.0	0.0	B31.3	
3(SUS)		11401.5	137895.1	8.3		7355.0	137895.1	5.3	B31.3	
4(EXP)		123.3	333336.3	0.0		137.3	337382.8	0.0	B31.3	
1(OPE)	178	7710.4	0.0	0.0	179	7355.3	0.0	0.0	B31.3	
3(SUS)		7355.0	137895.1	5.3		6820.2	137895.1	4.9	B31.3	
4(EXP)		169.6	337382.8	0.1		153.4	337917.7	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	179	7355.3	0.0	0.0	180	7634.7	0.0	0.0	B31.3	
3(SUS)		6820.2	137895.1	4.9		7399.3	137895.1	5.4	B31.3	
4(EXP)		153.4	337917.7	0.0		139.6	337338.5	0.0	B31.3	
1(OPE)	180	7491.3	0.0	0.0	190	10259.4	0.0	0.0	B31.3	
3(SUS)		7399.3	137895.1	5.4		10216.9	137895.1	7.4	B31.3	
4(EXP)		139.4	337338.5	0.0		141.7	334520.9	0.0	B31.3	
1(OPE)	190	10259.4	0.0	0.0	198	7673.5	0.0	0.0	B31.3	
3(SUS)		10216.9	137895.1	7.4		7601.9	137895.1	5.5	B31.3	
4(EXP)		141.7	334520.9	0.0		139.3	337136.0	0.0	B31.3	
1(OPE)	198	7974.4	0.0	0.0	199	7061.1	0.0	0.0	B31.3	
3(SUS)		7651.8	137895.1	5.5		6907.6	137895.1	5.0	B31.3	
4(EXP)		139.4	337086.0	0.0		155.5	337830.2	0.0	B31.3	
1(OPE)	199	7061.1	0.0	0.0	200	6949.6	0.0	0.0	B31.3	
3(SUS)		6907.6	137895.1	5.0		7026.2	137895.1	5.1	B31.3	
4(EXP)		155.5	337830.2	0.0		166.2	337711.6	0.0	B31.3	
1(OPE)	200	6891.7	0.0	0.0	208	10024.1	0.0	0.0	B31.3	
3(SUS)		7026.2	137895.1	5.1		10106.6	137895.1	7.3	B31.3	
4(EXP)		134.6	337711.6	0.0		82.5	334631.2	0.0	B31.3	
1(OPE)	208	11620.0	0.0	0.0	209	11663.6	0.0	0.0	B31.3	
3(SUS)		10488.6	137895.1	7.6		10519.8	137895.1	7.6	B31.3	
4(EXP)		122.1	334249.2	0.0		118.0	334218.0	0.0	B31.3	
1(OPE)	209	11663.6	0.0	0.0	210	11695.2	0.0	0.0	B31.3	
3(SUS)		10519.8	137895.1	7.6		10540.8	137895.1	7.6	B31.3	
4(EXP)		118.0	334218.0	0.0		113.3	334197.1	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements

Various Load Cases

Load Case	From Node	Code Stress KPa	Allowable Stress KPa	Ratio %	To Node	Code Stress KPa	Allowable Stress KPa	Ratio %	Piping Code	
1(OPE)	210	10078.1	0.0	0.0	218	7402.9	0.0	0.0	B31.3	
3(SUS)		10154.5	137895.1	7.4		7410.5	137895.1	5.4	B31.3	
4(EXP)		76.3	334583.4	0.0		7.6	337327.4	0.0	B31.3	
1(OPE)	218	7724.9	0.0	0.0	219	7119.8	0.0	0.0	B31.3	
3(SUS)		7486.5	137895.1	5.4		7047.1	137895.1	5.1	B31.3	
4(EXP)		11.2	337251.3	0.0		4.2	337690.8	0.0	B31.3	
1(OPE)	219	7119.8	0.0	0.0	220	6856.9	0.0	0.0	B31.3	
3(SUS)		7047.1	137895.1	5.1		6858.2	137895.1	5.0	B31.3	
4(EXP)		4.2	337690.8	0.0		1.2	337879.7	0.0	B31.3	
1(OPE)	220	6520.0	0.0	0.0	230	6523.6	0.0	0.0	B31.3	
3(SUS)		6520.0	137895.1	4.7		6523.6	137895.1	4.7	B31.3	
4(EXP)		0.0	338217.9	0.0		0.0	338214.2	0.0	B31.3	
1(OPE)	230	0.0	0.0	0.0	240	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	240	0.0	0.0	0.0	250	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
1(OPE)	250	6689.4	0.0	0.0	260	6697.1	0.0	0.0	B31.3	
3(SUS)		6689.4	137895.1	4.9		6697.1	137895.1	4.9	B31.3	
4(EXP)		0.0	338048.4	0.0		0.0	338040.7	0.0	B31.3	
1(OPE)	260	0.0	0.0	0.0	270	0.0	0.0	0.0	B31.3	
3(SUS)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	
4(EXP)		0.0	0.0	0.0		0.0	0.0	0.0	B31.3	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

CODE COMPLIANCE REPORT: Code Stresses on Elements
Various Load Cases

DISPLACEMENT REPORT

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
 Job:: 1650-2-311
 Licensed To:: XGM

Table of Contents

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS.....	2
Displacements : 1 (OPE) W+T1+P1.....	3
Displacements : 2 (Alt-SUS) W+P1.....	5
Displacements : 3 (SUS) W+P1.....	7
Displacements : 4 (EXP) L4=L1-L3.....	9

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS

- 1 (OPE) W+T1+P1
- 2 (Alt-SUS) W+P1
- 3 (SUS) W+P1
- 4 (EXP) L4=L1-L3

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 1 (OPE) W+T1+P1

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
10	-1.777	4.974	0.000	0.1871	-0.0001	-0.0525
20	-1.777	4.683	0.017	0.1871	-0.0001	-0.0525
30	-1.777	4.357	0.037	0.1873	-0.0001	-0.0525
40	-1.778	4.030	0.057	0.1876	-0.0001	-0.0525
50	-1.779	-0.000	0.293	0.2023	-0.0001	-0.0525
60	-1.779	-0.357	0.313	0.2040	-0.0001	-0.0525
63	-1.779	-0.629	0.328	0.2040	-0.0001	-0.0525
66	-1.779	-1.465	0.374	0.2040	-0.0001	-0.0525
70	-1.779	-1.737	0.389	0.2039	-0.0001	-0.0525
80	-1.780	-3.068	0.467	0.1720	-0.0001	-0.0525
90	-1.780	-4.162	0.539	0.1713	-0.0001	-0.0525
100	-1.780	-5.072	0.599	0.1706	-0.0001	-0.0525
105	-1.783	-6.093	1.000	-0.0973	-0.0001	-0.0525
107	-1.784	-3.548	1.201	-0.1799	-0.0001	-0.0525
108	-1.784	-1.836	1.301	-0.2012	-0.0001	-0.0525
109	-1.785	-0.927	1.351	-0.2060	-0.0001	-0.0525
110	-1.785	-0.000	1.402	-0.2065	-0.0001	-0.0381
119	-1.794	0.405	1.423	-0.1971	-0.0001	-0.0281
120	-1.815	0.593	1.431	-0.1911	-0.0001	-0.0121
130	-2.454	-0.000	1.428	-0.1411	-0.0001	0.0151
140	-3.241	-0.000	1.424	-0.0796	-0.0001	-0.0002
148	-3.943	-0.178	1.420	-0.0246	-0.0001	-0.0118
149	-3.964	-0.138	1.428	-0.0221	-0.0001	-0.0109
150	-3.973	-0.093	1.450	-0.0168	-0.0001	-0.0096
160	-3.973	-0.000	1.528	-0.0088	-0.0001	-0.0088
170	-3.977	-0.000	2.315	0.0075	-0.0001	-0.0012
178	-3.978	-0.242	2.497	0.0191	-0.0001	0.0006
179	-3.970	-0.279	2.519	0.0200	-0.0001	0.0007
180	-3.949	-0.293	2.528	0.0202	-0.0001	0.0015
190	-3.464	-0.000	2.530	0.0257	-0.0001	0.0035
198	-3.385	0.005	2.531	0.0265	-0.0001	-0.0007
199	-3.363	-0.006	2.552	0.0270	-0.0001	-0.0019
200	-3.352	-0.029	2.603	0.0269	-0.0001	-0.0020
208	-3.316	-0.206	3.191	0.0110	-0.0001	-0.0020
209	-3.315	-0.207	3.206	0.0076	-0.0001	-0.0020
210	-3.315	-0.211	3.219	0.0042	-0.0001	-0.0020
218	-3.316	-0.066	3.491	-0.0129	-0.0001	-0.0020
219	-3.315	-0.032	3.502	-0.0138	-0.0001	-0.0020
220	-3.311	-0.000	3.484	-0.0139	-0.0001	-0.0020
230	-3.309	0.009	3.473	-0.0139	-0.0001	-0.0020
240	-3.297	0.078	3.387	-0.0139	-0.0001	-0.0020
250	-3.285	0.147	3.302	-0.0139	-0.0001	-0.0020
260	-3.281	0.167	3.278	-0.0139	-0.0001	-0.0020
270	-3.278	0.184	3.256	-0.0139	-0.0001	-0.0020
1000	-1.647	-1.678	1.352	-0.1959	-0.0001	-0.0630
1005	-1.576	-2.078	1.353	-0.1958	-0.0001	-0.0628
1010	-1.536	-2.288	1.353	-0.1930	-0.0001	-0.0571

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 1 (OPE) W+T1+P1

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
1013	-1.537	-0.585	1.451	-0.1963	-0.0001	-0.0384
1014	-1.546	-0.193	1.472	-0.1901	-0.0001	-0.0314
1015	-1.567	-0.000	1.481	-0.1843	-0.0001	-0.0172
1020	-2.422	-0.000	1.476	-0.0970	-0.0001	0.0041
1025	-3.209	-0.000	1.472	-0.0166	-0.0001	-0.0076
1028	-3.287	0.036	1.471	-0.0086	-0.0001	-0.0039
1029	-3.309	0.046	1.480	-0.0054	-0.0001	-0.0018
1030	-3.317	0.052	1.501	-0.0004	-0.0001	-0.0005
1033	-3.319	-0.028	1.876	0.0009	-0.0001	-0.0005
1034	-3.319	-0.021	1.897	0.0005	-0.0001	-0.0005
1035	-3.318	-0.000	1.907	0.0005	-0.0001	-0.0005
1040	-3.318	0.009	1.907	0.0005	-0.0001	-0.0005
1045	-3.315	0.078	1.910	0.0005	-0.0001	-0.0005
1050	-3.311	0.147	1.913	0.0005	-0.0001	-0.0005
1055	-3.310	0.166	1.914	0.0005	-0.0001	-0.0005
1060	-3.310	0.184	1.914	0.0005	-0.0001	-0.0005
2000	-1.532	-4.969	0.601	0.1715	-0.0001	-0.0571
2005	-1.532	-4.054	0.541	0.1721	-0.0001	-0.0571
2010	-1.531	-2.955	0.469	0.1726	-0.0001	-0.0571
2011	-1.531	-1.670	0.390	0.1897	-0.0001	-0.0571
2012	-1.530	-0.328	0.310	0.1895	-0.0001	-0.0571
2013	-1.531	-1.386	0.373	0.1897	-0.0001	-0.0571
2014	-1.531	-0.611	0.327	0.1896	-0.0001	-0.0571
2015	-1.529	3.012	0.055	0.1154	-0.0001	-0.0571
2016	-1.530	-0.000	0.291	0.1824	-0.0001	-0.0571
2020	-1.529	3.209	0.035	0.1105	-0.0001	-0.0571
2025	-1.529	3.396	0.015	0.1039	-0.0001	-0.0571
2030	-1.529	3.528	0.001	0.1039	-0.0001	-0.0571
2035	-1.527	6.205	-0.412	0.0629	-0.0001	-0.0571

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 2 (Alt-SUS) W+P1

Output disabled for field "DX"

Output disabled for field "DY"

Output disabled for field "DZ"

Output disabled for field "RX"

Output disabled for field "RY"

Output disabled for field "RZ"

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
10	N/A	N/A	N/A	N/A	N/A	N/A
20	N/A	N/A	N/A	N/A	N/A	N/A
30	N/A	N/A	N/A	N/A	N/A	N/A
40	N/A	N/A	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A	N/A	N/A
60	N/A	N/A	N/A	N/A	N/A	N/A
63	N/A	N/A	N/A	N/A	N/A	N/A
66	N/A	N/A	N/A	N/A	N/A	N/A
70	N/A	N/A	N/A	N/A	N/A	N/A
80	N/A	N/A	N/A	N/A	N/A	N/A
90	N/A	N/A	N/A	N/A	N/A	N/A
100	N/A	N/A	N/A	N/A	N/A	N/A
105	N/A	N/A	N/A	N/A	N/A	N/A
107	N/A	N/A	N/A	N/A	N/A	N/A
108	N/A	N/A	N/A	N/A	N/A	N/A
109	N/A	N/A	N/A	N/A	N/A	N/A
110	N/A	N/A	N/A	N/A	N/A	N/A
119	N/A	N/A	N/A	N/A	N/A	N/A
120	N/A	N/A	N/A	N/A	N/A	N/A
130	N/A	N/A	N/A	N/A	N/A	N/A
140	N/A	N/A	N/A	N/A	N/A	N/A
148	N/A	N/A	N/A	N/A	N/A	N/A
149	N/A	N/A	N/A	N/A	N/A	N/A
150	N/A	N/A	N/A	N/A	N/A	N/A
160	N/A	N/A	N/A	N/A	N/A	N/A
170	N/A	N/A	N/A	N/A	N/A	N/A
178	N/A	N/A	N/A	N/A	N/A	N/A
179	N/A	N/A	N/A	N/A	N/A	N/A
180	N/A	N/A	N/A	N/A	N/A	N/A
190	N/A	N/A	N/A	N/A	N/A	N/A
198	N/A	N/A	N/A	N/A	N/A	N/A
199	N/A	N/A	N/A	N/A	N/A	N/A
200	N/A	N/A	N/A	N/A	N/A	N/A
208	N/A	N/A	N/A	N/A	N/A	N/A
209	N/A	N/A	N/A	N/A	N/A	N/A
210	N/A	N/A	N/A	N/A	N/A	N/A
218	N/A	N/A	N/A	N/A	N/A	N/A
219	N/A	N/A	N/A	N/A	N/A	N/A
220	N/A	N/A	N/A	N/A	N/A	N/A
230	N/A	N/A	N/A	N/A	N/A	N/A

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 2 (Alt-SUS) W+P1

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
240	N/A	N/A	N/A	N/A	N/A	N/A
250	N/A	N/A	N/A	N/A	N/A	N/A
260	N/A	N/A	N/A	N/A	N/A	N/A
270	N/A	N/A	N/A	N/A	N/A	N/A
1000	N/A	N/A	N/A	N/A	N/A	N/A
1005	N/A	N/A	N/A	N/A	N/A	N/A
1010	N/A	N/A	N/A	N/A	N/A	N/A
1013	N/A	N/A	N/A	N/A	N/A	N/A
1014	N/A	N/A	N/A	N/A	N/A	N/A
1015	N/A	N/A	N/A	N/A	N/A	N/A
1020	N/A	N/A	N/A	N/A	N/A	N/A
1025	N/A	N/A	N/A	N/A	N/A	N/A
1028	N/A	N/A	N/A	N/A	N/A	N/A
1029	N/A	N/A	N/A	N/A	N/A	N/A
1030	N/A	N/A	N/A	N/A	N/A	N/A
1033	N/A	N/A	N/A	N/A	N/A	N/A
1034	N/A	N/A	N/A	N/A	N/A	N/A
1035	N/A	N/A	N/A	N/A	N/A	N/A
1040	N/A	N/A	N/A	N/A	N/A	N/A
1045	N/A	N/A	N/A	N/A	N/A	N/A
1050	N/A	N/A	N/A	N/A	N/A	N/A
1055	N/A	N/A	N/A	N/A	N/A	N/A
1060	N/A	N/A	N/A	N/A	N/A	N/A
2000	N/A	N/A	N/A	N/A	N/A	N/A
2005	N/A	N/A	N/A	N/A	N/A	N/A
2010	N/A	N/A	N/A	N/A	N/A	N/A
2011	N/A	N/A	N/A	N/A	N/A	N/A
2012	N/A	N/A	N/A	N/A	N/A	N/A
2013	N/A	N/A	N/A	N/A	N/A	N/A
2014	N/A	N/A	N/A	N/A	N/A	N/A
2015	N/A	N/A	N/A	N/A	N/A	N/A
2016	N/A	N/A	N/A	N/A	N/A	N/A
2020	N/A	N/A	N/A	N/A	N/A	N/A
2025	N/A	N/A	N/A	N/A	N/A	N/A
2030	N/A	N/A	N/A	N/A	N/A	N/A
2035	N/A	N/A	N/A	N/A	N/A	N/A

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 3 (SUS) W+P1

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
10	0.043	4.974	0.000	0.1871	0.0000	-0.0526
20	0.043	4.683	0.000	0.1871	0.0000	-0.0526
30	0.043	4.357	0.000	0.1873	0.0000	-0.0526
40	0.043	4.030	0.000	0.1876	0.0000	-0.0526
50	0.044	-0.000	0.000	0.2023	0.0000	-0.0526
60	0.044	-0.357	0.000	0.2040	0.0000	-0.0526
63	0.044	-0.629	0.000	0.2040	0.0000	-0.0526
66	0.044	-1.465	0.000	0.2040	0.0000	-0.0526
70	0.044	-1.737	0.000	0.2039	0.0000	-0.0526
80	0.044	-3.068	0.000	0.1720	0.0000	-0.0526
90	0.044	-4.162	0.000	0.1713	0.0000	-0.0526
100	0.044	-5.072	0.000	0.1706	0.0000	-0.0526
105	0.044	-6.093	0.000	-0.0973	0.0000	-0.0526
107	0.044	-3.548	0.000	-0.1799	0.0000	-0.0526
108	0.044	-1.836	0.000	-0.2012	0.0000	-0.0526
109	0.044	-0.927	0.000	-0.2060	0.0000	-0.0526
110	0.044	-0.000	0.000	-0.2065	0.0000	-0.0381
119	0.044	0.405	0.000	-0.1971	0.0000	-0.0281
120	0.044	0.593	0.000	-0.1911	0.0000	-0.0121
130	0.044	-0.000	0.000	-0.1410	0.0000	0.0151
140	0.044	-0.000	0.001	-0.0793	0.0000	-0.0002
148	0.044	-0.175	0.001	-0.0242	0.0000	-0.0119
149	0.044	-0.135	0.001	-0.0218	0.0000	-0.0111
150	0.044	-0.090	0.001	-0.0165	0.0000	-0.0097
160	0.044	-0.000	0.001	-0.0084	0.0000	-0.0090
170	0.045	-0.000	0.001	0.0067	0.0000	-0.0017
178	0.045	-0.225	0.001	0.0177	0.0000	-0.0000
179	0.045	-0.259	0.001	0.0184	0.0000	0.0002
180	0.045	-0.272	0.001	0.0184	0.0000	0.0010
190	0.045	-0.000	0.001	0.0217	0.0000	0.0031
198	0.045	0.003	0.001	0.0222	0.0000	-0.0011
199	0.046	-0.013	0.013	0.0225	0.0000	-0.0022
200	0.049	-0.045	0.043	0.0222	0.0001	-0.0023
208	0.092	-0.334	0.331	0.0055	0.0001	-0.0023
209	0.093	-0.337	0.334	0.0020	0.0001	-0.0023
210	0.094	-0.337	0.334	-0.0015	0.0001	-0.0023
218	0.096	-0.052	0.334	-0.0188	0.0001	-0.0023
219	0.098	-0.016	0.319	-0.0197	0.0001	-0.0023
220	0.102	-0.000	0.281	-0.0199	0.0001	-0.0023
230	0.104	-0.000	0.265	-0.0199	0.0001	-0.0023
240	0.118	-0.000	0.143	-0.0199	0.0001	-0.0023
250	0.132	-0.000	0.022	-0.0199	0.0001	-0.0023
260	0.136	-0.000	-0.013	-0.0199	0.0001	-0.0023
270	0.139	-0.000	-0.044	-0.0199	0.0001	-0.0023
1000	0.044	-1.678	-0.000	-0.1960	0.0000	-0.0630
1005	0.044	-2.079	-0.000	-0.1959	0.0000	-0.0629
1010	0.044	-2.289	-0.000	-0.1930	0.0000	-0.0571

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 3 (SUS) W+P1

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
1013	0.044	-0.585	-0.000	-0.1963	0.0000	-0.0384
1014	0.044	-0.193	-0.000	-0.1902	0.0000	-0.0314
1015	0.044	-0.000	-0.000	-0.1844	0.0000	-0.0172
1020	0.044	-0.000	0.000	-0.0974	0.0000	0.0041
1025	0.044	-0.000	0.001	-0.0173	0.0000	-0.0076
1028	0.044	0.036	0.001	-0.0093	0.0000	-0.0039
1029	0.044	0.047	0.001	-0.0061	0.0000	-0.0018
1030	0.044	0.054	0.001	-0.0011	0.0000	-0.0006
1033	0.044	-0.001	0.001	0.0001	0.0000	-0.0006
1034	0.045	-0.000	0.001	-0.0003	0.0000	-0.0006
1035	0.046	-0.000	0.000	-0.0003	0.0000	-0.0006
1040	0.046	-0.000	-0.000	-0.0003	0.0000	-0.0006
1045	0.050	-0.000	-0.002	-0.0003	0.0000	-0.0006
1050	0.053	-0.000	-0.004	-0.0003	0.0000	-0.0006
1055	0.054	-0.000	-0.005	-0.0003	0.0000	-0.0006
1060	0.055	-0.000	-0.006	-0.0003	0.0000	-0.0006
2000	0.044	-4.969	-0.000	0.1715	0.0000	-0.0571
2005	0.044	-4.054	-0.000	0.1721	0.0000	-0.0571
2010	0.044	-2.956	-0.000	0.1727	0.0000	-0.0571
2011	0.044	-1.670	-0.000	0.1897	0.0000	-0.0571
2012	0.044	-0.328	-0.000	0.1895	0.0000	-0.0571
2013	0.044	-1.386	-0.000	0.1897	0.0000	-0.0571
2014	0.044	-0.611	-0.000	0.1896	0.0000	-0.0571
2015	0.043	3.012	-0.000	0.1154	0.0000	-0.0571
2016	0.044	-0.000	-0.000	0.1824	0.0000	-0.0571
2020	0.043	3.210	-0.000	0.1105	0.0000	-0.0571
2025	0.043	3.396	-0.000	0.1039	0.0000	-0.0571
2030	0.043	3.529	-0.000	0.1039	0.0000	-0.0571
2035	0.043	6.206	-0.000	0.0629	0.0000	-0.0571

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements

CASE 4 (EXP) L4=L1-L3

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
10	-1.821	-0.000	0.000	-0.0000	-0.0001	0.0000
20	-1.821	-0.000	0.017	-0.0000	-0.0001	0.0000
30	-1.821	-0.000	0.037	-0.0000	-0.0001	0.0000
40	-1.821	-0.000	0.057	-0.0000	-0.0001	0.0000
50	-1.822	0.000	0.293	-0.0000	-0.0001	0.0000
60	-1.822	0.000	0.313	-0.0000	-0.0001	0.0000
63	-1.823	0.000	0.328	-0.0000	-0.0001	0.0000
66	-1.823	0.000	0.374	-0.0000	-0.0001	0.0000
70	-1.823	0.000	0.389	-0.0000	-0.0001	0.0000
80	-1.823	0.000	0.467	-0.0000	-0.0001	0.0000
90	-1.824	0.000	0.539	-0.0000	-0.0001	0.0000
100	-1.824	0.000	0.599	-0.0000	-0.0001	0.0000
105	-1.827	0.000	1.000	0.0000	-0.0001	0.0000
107	-1.828	0.000	1.201	0.0000	-0.0001	0.0000
108	-1.828	0.000	1.301	0.0000	-0.0001	0.0000
109	-1.829	-0.000	1.351	0.0000	-0.0001	0.0000
110	-1.829	0.000	1.402	-0.0000	-0.0001	0.0000
119	-1.838	0.000	1.423	-0.0000	-0.0001	0.0000
120	-1.859	-0.000	1.431	-0.0000	-0.0001	0.0000
130	-2.498	-0.000	1.428	-0.0001	-0.0001	-0.0000
140	-3.285	0.000	1.423	-0.0003	-0.0001	0.0000
148	-3.987	-0.003	1.419	-0.0004	-0.0001	0.0001
149	-4.008	-0.003	1.427	-0.0004	-0.0001	0.0001
150	-4.017	-0.003	1.448	-0.0004	-0.0001	0.0002
160	-4.017	0.000	1.527	-0.0004	-0.0001	0.0002
170	-4.022	-0.000	2.314	0.0008	-0.0001	0.0005
178	-4.023	-0.018	2.496	0.0014	-0.0001	0.0006
179	-4.015	-0.020	2.517	0.0016	-0.0001	0.0005
180	-3.993	-0.020	2.526	0.0018	-0.0001	0.0005
190	-3.509	-0.000	2.529	0.0040	-0.0001	0.0004
198	-3.430	0.003	2.530	0.0043	-0.0001	0.0003
199	-3.409	0.007	2.539	0.0044	-0.0001	0.0003
200	-3.401	0.016	2.560	0.0047	-0.0001	0.0003
208	-3.408	0.128	2.859	0.0055	-0.0001	0.0003
209	-3.408	0.130	2.872	0.0056	-0.0001	0.0003
210	-3.409	0.127	2.885	0.0056	-0.0001	0.0003
218	-3.412	-0.014	3.157	0.0059	-0.0001	0.0003
219	-3.413	-0.017	3.183	0.0059	-0.0001	0.0003
220	-3.413	0.000	3.203	0.0059	-0.0001	0.0003
230	-3.413	0.009	3.208	0.0059	-0.0001	0.0003
240	-3.415	0.078	3.244	0.0059	-0.0001	0.0003
250	-3.417	0.147	3.281	0.0059	-0.0001	0.0003
260	-3.417	0.167	3.291	0.0059	-0.0001	0.0003
270	-3.417	0.184	3.300	0.0059	-0.0001	0.0003
1000	-1.691	0.000	1.352	0.0000	-0.0001	0.0000
1005	-1.620	0.000	1.353	0.0000	-0.0001	0.0000
1010	-1.580	0.001	1.353	0.0000	-0.0001	0.0000

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
 Job:: 1650-2-311
 Licensed To:: XGM

DISPLACEMENTS REPORT: Nodal Movements
 CASE 4 (EXP) L4=L1-L3

Node	DX mm.	DY mm.	DZ mm.	RX deg.	RY deg.	RZ deg.
1013	-1.581	0.000	1.451	0.0001	-0.0001	0.0000
1014	-1.590	0.000	1.472	0.0001	-0.0001	0.0000
1015	-1.611	-0.000	1.481	0.0001	-0.0001	0.0000
1020	-2.466	0.000	1.475	0.0004	-0.0001	-0.0000
1025	-3.253	-0.000	1.471	0.0007	-0.0001	0.0000
1028	-3.332	-0.000	1.470	0.0007	-0.0001	0.0000
1029	-3.353	-0.001	1.479	0.0007	-0.0001	0.0000
1030	-3.362	-0.002	1.500	0.0007	-0.0001	0.0000
1033	-3.364	-0.028	1.875	0.0008	-0.0001	0.0000
1034	-3.364	-0.021	1.897	0.0008	-0.0001	0.0000
1035	-3.364	0.000	1.907	0.0008	-0.0001	0.0000
1040	-3.364	0.009	1.908	0.0008	-0.0001	0.0000
1045	-3.364	0.078	1.912	0.0008	-0.0001	0.0000
1050	-3.365	0.147	1.917	0.0008	-0.0001	0.0000
1055	-3.365	0.167	1.919	0.0008	-0.0001	0.0000
1060	-3.365	0.184	1.920	0.0008	-0.0001	0.0000
2000	-1.576	0.001	0.601	-0.0000	-0.0001	0.0000
2005	-1.575	0.000	0.541	-0.0000	-0.0001	0.0000
2010	-1.575	0.000	0.469	-0.0000	-0.0001	0.0000
2011	-1.575	0.000	0.390	-0.0000	-0.0001	0.0000
2012	-1.574	0.000	0.310	-0.0000	-0.0001	0.0000
2013	-1.574	0.000	0.373	-0.0000	-0.0001	0.0000
2014	-1.574	0.000	0.327	-0.0000	-0.0001	0.0000
2015	-1.572	-0.000	0.055	-0.0000	-0.0001	0.0000
2016	-1.574	0.000	0.291	-0.0000	-0.0001	0.0000
2020	-1.572	-0.000	0.035	-0.0000	-0.0001	0.0000
2025	-1.572	-0.000	0.015	-0.0000	-0.0001	0.0000
2030	-1.572	-0.001	0.001	-0.0000	-0.0001	0.0000
2035	-1.570	-0.001	-0.412	-0.0000	-0.0001	0.0000

RESTRAINT SUMMARY REPORT

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

Table of Contents

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS.....	2
Restraint Summary : Multiple.....	3

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS

- 1 (OPE) W+T1+P1
- 2 (Alt-SUS) W+P1
- 3 (SUS) W+P1
- 4 (EXP) L4=L1-L3

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

RESTRAINT SUMMARY REPORT: Loads On Restraints

Various Load Cases

LOAD CASE DEFINITION KEY

CASE 1 (OPE) W+T1+P1

CASE 3 (SUS) W+P1

CASE 4 (EXP) L4=L1-L3

Node	Load Case	FX N.	FY N.	FZ N.	MX N.m.	MY N.m.	MZ N.m.
50		TYPE=Rigid +Y;					
	1(OPE)	0	-2989	0	0	0	0
	3(SUS)	0	-2989	0	0	0	0
	4(EXP)	0	0	0	0	0	0
	MAX		-2989/L3				
110		TYPE=Rigid +Y;					
	1(OPE)	0	-2764	0	0	0	0
	3(SUS)	0	-2764	0	0	0	0
	4(EXP)	0	0	0	0	0	0
	MAX		-2764/L3				
130		TYPE=Rigid +Y;					
	1(OPE)	0	-569	0	0	0	0
	3(SUS)	0	-569	0	0	0	0
	4(EXP)	0	-0	0	0	0	0
	MAX		-569/L1				
140		TYPE=Rigid +Y;					
	1(OPE)	0	-1023	0	0	0	0
	3(SUS)	0	-1023	0	0	0	0
	4(EXP)	0	0	0	0	0	0
	MAX		-1023/L3				
160		TYPE=Rigid +Y;					
	1(OPE)	0	-856	0	0	0	0
	3(SUS)	0	-858	0	0	0	0
	4(EXP)	0	2	0	0	0	0
	MAX		-858/L3				
170		TYPE=Rigid +Y;					
	1(OPE)	0	-836	0	0	0	0
	3(SUS)	0	-834	0	0	0	0
	4(EXP)	0	-1	0	0	0	0
	MAX		-836/L1				
190		TYPE=Rigid					

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

RESTRAINT SUMMARY REPORT: Loads On Restraints

Various Load Cases

Node	Load Case	FX N.	FY N.	FZ N.	MX N.m.	MY N.m.	MZ N.m.
		+Y;					
	1(OPE)	0	-893	0	0	0	0
	3(SUS)	0	-889	0	0	0	0
	4(EXP)	0	-5	0	0	0	0
	MAX		-893/L1				
220		TYPE=Rigid +Y;					
	1(OPE)	0	-958	0	0	0	0
	3(SUS)	0	-962	0	0	0	0
	4(EXP)	0	3	0	0	0	0
	MAX		-962/L3				
1015		TYPE=Rigid +Y;					
	1(OPE)	0	-1388	0	0	0	0
	3(SUS)	0	-1388	0	0	0	0
	4(EXP)	0	-0	0	0	0	0
	MAX		-1388/L1				
1020		TYPE=Rigid +Y;					
	1(OPE)	0	-871	0	0	0	0
	3(SUS)	0	-871	0	0	0	0
	4(EXP)	0	0	0	0	0	0
	MAX		-871/L3				
1025		TYPE=Rigid +Y;					
	1(OPE)	0	-866	0	0	0	0
	3(SUS)	0	-866	0	0	0	0
	4(EXP)	0	-0	0	0	0	0
	MAX		-866/L1				
1035		TYPE=Rigid +Y;					
	1(OPE)	0	-2239	0	0	0	0
	3(SUS)	0	-2239	0	0	0	0
	4(EXP)	0	0	0	0	0	0
	MAX		-2239/L3				
2016		TYPE=Rigid +Y;					
	1(OPE)	0	-3783	0	0	0	0
	3(SUS)	0	-3783	0	0	0	0
	4(EXP)	0	0	0	0	0	0
	MAX		-3783/L3				

STRESS REPORT

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

Table of Contents

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS.....	2
B31.3 Stresses : 1 (OPE) W+T1+P1.....	3
B31.3 Stresses : 3 (SUS) W+P1.....	11
B31.3 Stresses : 4 (EXP) L4=L1-L3.....	19

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

LISTING OF STATIC LOAD CASES FOR THIS ANALYSIS

- 1 (OPE) W+T1+P1
- 2 (Alt-SUS) W+P1
- 3 (SUS) W+P1
- 4 (EXP) L4=L1-L3

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
 Job:: 1650-2-311
 Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements
 CASE 1 (OPE) W+T1+P1

Piping Code (1 of 1): B31.3 -2016, Jan 31, 2017

The SLP column shows the longitudinal pressure stress.

NO Stresses Evaluation CHECK PROCESSED: LOADCASE 1 (OPE) W+T1+P1

Highest Stresses: (KPa)

SLP	6737.8	@Node	40
F/A	730.9	@Node	1035
Bending	30213.8	@Node	100
Torsion	4445.9	@Node	109
SIF/Index In-Plane	1.5	@Node	1013
SIF/Index Out-Plane	1.2	@Node	1013
SIF/Index Torsion	1.0	@Node	20
SIF/Index Axial	1.0	@Node	20

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out- Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
10												
20												
20	4838.2	0.0	129.6	0.0	1.000	1.000	1.000	1.000	4967.8			
30	4838.2	0.0	442.2	-0.0	1.000	1.000	1.000	1.000	5280.3			
30	4838.2	0.0	442.2	0.0	1.000	1.000	1.000	1.000	5280.3			
40	6737.8	0.0	452.5	-0.0	1.000	1.000	1.000	1.000	7190.3			
40	6737.8	0.0	452.5	0.0	1.000	1.000	1.000	1.000	7190.3			
50	6737.8	0.0	5296.3	-0.0	1.000	1.000	1.000	1.000	12034.1			
50	6737.8	0.0	5296.3	0.0	1.000	1.000	1.000	1.000	12034.1			
60	6737.8	0.0	1632.8	-0.0	1.000	1.000	1.000	1.000	8370.6			

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
60												
63												
63												
66												
66												
70												
70	6737.8	0.0	10749.4	0.0	1.000	1.000	1.000	1.000	17487.2			
80	6737.8	0.0	21481.6	-0.0	1.000	1.000	1.000	1.000	28219.4			
80												
90												
90												
100												
100	6737.8	0.0	30213.8	0.0	1.000	1.000	1.000	1.000	36951.6			
105	6737.8	0.0	20915.3	-0.0	1.000	1.000	1.000	1.000	27653.1			
105	6737.8	0.0	20915.3	0.0	1.000	1.000	1.000	1.000	27653.1			
107	6737.8	0.0	11395.8	-0.0	1.000	1.000	1.000	1.000	18133.6			
107	6737.8	0.0	11395.8	0.0	1.000	1.000	1.000	1.000	18133.6			
108	6737.8	0.0	5418.5	-0.0	1.000	1.000	1.000	1.000	12156.3			
108	6737.8	0.0	5418.5	0.0	1.000	1.000	1.000	1.000	12156.3			
109	6737.8	0.0	2125.4	-0.0	1.000	1.000	1.000	1.000	8863.2			
109	6737.8	0.0	8891.8	-1132.5	1.000	1.000	1.000	1.000	15913.5			

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

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CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

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B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
2016	6737.8	-0.0	16591.0	-0.0	1.000	1.000	1.000	1.000	23328.8			
2015	6737.8	-0.0	6820.5	0.0	1.000	1.000	1.000	1.000	13558.3			
2015	6737.8	-0.0	6820.5	-0.0	1.000	1.000	1.000	1.000	13558.3			
2020	4838.2	-0.0	10956.3	0.0	1.000	1.000	1.000	1.000	15794.5			
2020	4838.2	-0.0	10956.3	-0.0	1.000	1.000	1.000	1.000	15794.5			
2025	4838.2	-0.0	9919.2	0.0	1.000	1.000	1.000	1.000	14757.3			
2025												
2030												
2030	4838.2	-0.0	9227.3	-0.0	1.000	1.000	1.000	1.000	14065.4			
2035	4838.2	0.0	0.0	0.0	1.000	1.000	1.000	1.000	4838.2			
1010	6737.8	0.0	3950.7	-2955.1	1.000	1.000	1.000	1.000	13846.8			
1013	6737.8	0.0	1366.1	2955.1	1.000	1.000	1.000	1.000	12803.7			
1013	6737.8	0.0	1689.5	-2955.1	1.484	1.237	1.000	1.000	12884.7			
1014	6737.8	0.0	7916.9	1347.9	1.484	1.237	1.000	1.000	15101.1			
1014	6737.8	0.0	7916.9	-1347.9	1.484	1.237	1.000	1.000	15101.1			
1015	6737.8	0.0	9559.2	-1577.1	1.484	1.237	1.000	1.000	16803.9			
1015	6737.8	0.0	7729.3	1577.1	1.000	1.000	1.000	1.000	15085.9			
1020	6737.8	0.0	4089.3	-1577.1	1.000	1.000	1.000	1.000	11902.2			
1020	6737.8	0.0	4089.3	1577.1	1.000	1.000	1.000	1.000	11902.2			
1025	6737.8	0.0	3049.0	-1577.1	1.000	1.000	1.000	1.000	11124.7			
1025	6737.8	0.0	3049.0	1577.1	1.000	1.000	1.000	1.000	11124.7			
1028	6737.8	0.0	743.1	-1577.1	1.000	1.000	1.000	1.000	9978.3			

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
1028	6737.8	0.0	919.0	1577.1	1.484	1.237	1.000	1.000	10023.1			
1029	6737.8	0.0	2748.4	-964.5	1.484	1.237	1.000	1.000	10095.6			
1029	6737.8	0.0	2748.4	964.5	1.484	1.237	1.000	1.000	10095.6			
1030	6737.8	0.0	3020.4	0.0	1.484	1.237	1.000	1.000	9758.2			
1030	6737.8	0.0	2442.2	-0.0	1.000	1.000	1.000	1.000	9180.0			
1033	6737.8	0.0	276.9	0.0	1.000	1.000	1.000	1.000	7014.7			
1033	6737.8	0.0	411.0	-0.0	1.484	1.237	1.000	1.000	7148.8			
1034	6737.8	33.4	135.6	0.0	1.484	1.237	1.000	1.000	6906.8			
1034	6737.8	33.4	135.6	-0.0	1.484	1.237	1.000	1.000	6906.8			
1035	6737.8	56.4	0.0	-0.0	1.484	1.237	1.000	1.000	6794.2			
1035	6737.8	-730.9	0.0	0.0	1.000	1.000	1.000	1.000	6006.9			
1040	6737.8	-727.3	0.0	-0.0	1.000	1.000	1.000	1.000	6010.5			
1040												
1045												
1045												
1050												
1050	6737.8	-48.4	0.0	0.0	1.000	1.000	1.000	1.000	6689.4			
1055	6737.8	-40.7	0.0	-0.0	1.000	1.000	1.000	1.000	6697.1			
1055												
1060												
109	6737.8	0.0	4390.4	-4445.9	1.000	1.000	1.000	1.000	16654.4			

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

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CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
178	6737.8	0.0	925.6	-149.4	1.484	1.237	1.000	1.000	7710.4			
179	6737.8	0.0	32.7	308.3	1.484	1.237	1.000	1.000	7355.3			
179	6737.8	0.0	32.7	-308.3	1.484	1.237	1.000	1.000	7355.3			
180	6737.8	-0.0	826.8	173.8	1.484	1.237	1.000	1.000	7634.7			
180	6737.8	-0.0	668.6	-173.8	1.000	1.000	1.000	1.000	7491.3			
190	6737.8	-0.0	3504.4	173.8	1.000	1.000	1.000	1.000	10259.4			
190	6737.8	-0.0	3504.4	-173.8	1.000	1.000	1.000	1.000	10259.4			
198	6737.8	-0.0	868.8	173.8	1.000	1.000	1.000	1.000	7673.5			
198	6737.8	-0.0	1186.8	-173.8	1.484	1.237	1.000	1.000	7974.4			
199	6737.8	-68.9	392.2	-2.1	1.484	1.237	1.000	1.000	7061.1			
199	6737.8	-68.9	392.2	2.1	1.484	1.237	1.000	1.000	7061.1			
200	6737.8	-90.9	302.8	-0.0	1.484	1.237	1.000	1.000	6949.6			
200	6737.8	-90.9	244.8	0.0	1.000	1.000	1.000	1.000	6891.7			
208	6737.8	-10.5	3296.8	-0.0	1.000	1.000	1.000	1.000	10024.1			
208	6737.8	-10.5	4892.7	0.0	1.484	1.237	1.000	1.000	11620.0			
209	6737.8	-3.9	4929.7	0.0	1.484	1.237	1.000	1.000	11663.6			
209	6737.8	-3.9	4929.7	-0.0	1.484	1.237	1.000	1.000	11663.6			
210	6737.8	0.0	4957.4	0.0	1.484	1.237	1.000	1.000	11695.2			
210	6737.8	0.0	3340.3	-0.0	1.000	1.000	1.000	1.000	10078.1			
218	6737.8	0.0	665.1	0.0	1.000	1.000	1.000	1.000	7402.9			
218	6737.8	0.0	987.1	-0.0	1.484	1.237	1.000	1.000	7724.9			
219	6737.8	77.7	304.3	0.0	1.484	1.237	1.000	1.000	7119.8			

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 1 (OPE) W+T1+P1

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CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

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B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

Piping Code (1 of 1): B31.3 -2016, Jan 31, 2017

The SLP column shows the longitudinal pressure stress.

Stresses Evaluation CHECK PASSED : LOADCASE 3 (SUS) W+P1

Highest Stresses: (KPa)

Ratio (%):	26.8	@Node	100
Code:	36951.7	Allowable:	137895.1
SLP	6737.8	@Node	40
F/A	730.9	@Node	1035
Bending	30213.9	@Node	100
Torsion	4446.9	@Node	109
SIF/Index In-Plane	1.1	@Node	1013
SIF/Index Out-Plane	1.0	@Node	20
SIF/Index Torsion	1.0	@Node	20
SIF/Index Axial	1.0	@Node	20

[illegible]

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
50	6737.8	0.0	5296.3	0.0	1.000	1.000	1.000	1.000	12034.1	137895.1	8.7	
60	6737.8	0.0	1632.8	-0.0	1.000	1.000	1.000	1.000	8370.6	137895.1	6.1	
60												
63												
63												
66												
66												
70												
70	6737.8	0.0	10749.5	0.0	1.000	1.000	1.000	1.000	17487.3	137895.1	12.7	
80	6737.8	0.0	21481.6	-0.0	1.000	1.000	1.000	1.000	28219.4	137895.1	20.5	
80												
90												
90												
100												
100	6737.8	0.0	30213.9	0.0	1.000	1.000	1.000	1.000	36951.7	137895.1	26.8	
105	6737.8	0.0	20915.5	-0.0	1.000	1.000	1.000	1.000	27653.3	137895.1	20.1	
105	6737.8	0.0	20915.5	0.0	1.000	1.000	1.000	1.000	27653.3	137895.1	20.1	
107	6737.8	0.0	11396.0	-0.0	1.000	1.000	1.000	1.000	18133.8	137895.1	13.2	
107	6737.8	0.0	11396.0	0.0	1.000	1.000	1.000	1.000	18133.8	137895.1	13.2	
108	6737.8	0.0	5418.7	-0.0	1.000	1.000	1.000	1.000	12156.5	137895.1	8.8	
108	6737.8	0.0	5418.7	0.0	1.000	1.000	1.000	1.000	12156.5	137895.1	8.8	
109	6737.8	0.0	2125.7	-0.0	1.000	1.000	1.000	1.000	8863.5	137895.1	6.4	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
109	6737.8	-0.0	8893.8	-1130.3	1.000	1.000	1.000	1.000	15794.2	137895.1	11.5	
1000	6737.8	-0.0	2579.0	1130.3	1.000	1.000	1.000	1.000	9587.1	137895.1	7.0	
1000												
1005												
1005	6737.8	-0.0	5664.0	-1130.3	1.000	1.000	1.000	1.000	12606.1	137895.1	9.1	
1010	6737.8	-0.0	5913.0	1130.3	1.000	1.000	1.000	1.000	12851.1	137895.1	9.3	
1010	6737.8	0.0	6219.6	-0.0	1.000	1.000	1.000	1.000	12957.4	137895.1	9.4	
2000	6737.8	0.0	24840.2	0.0	1.000	1.000	1.000	1.000	31578.0	137895.1	22.9	
2000												
2005												
2005												
2010												
2010	6737.8	0.0	14449.6	-0.0	1.000	1.000	1.000	1.000	21187.4	137895.1	15.4	
2011	6737.8	0.0	2727.4	0.0	1.000	1.000	1.000	1.000	9465.2	137895.1	6.9	
2011												
2013												
2013												
2014												
2014												
2012												
2012	6737.8	0.0	12203.3	-0.0	1.000	1.000	1.000	1.000	18941.1	137895.1	13.7	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

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CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
Job:: 1650-2-311
Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements CASE 3 (SUS) W+P1

[illegible]

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
109	6737.8	0.0	4386.3	-4446.9	1.000	1.000	1.000	1.000	14242.3	137895.1	10.3	
110	6737.8	0.0	3578.8	4446.9	1.000	1.000	1.000	1.000	13621.0	137895.1	9.9	
110	6737.8	0.0	3578.8	-4446.9	1.113	1.000	1.000	1.000	13621.0	137895.1	9.9	
119	6737.8	-0.0	7993.5	2051.8	1.113	1.000	1.000	1.000	15292.1	137895.1	11.1	
119	6737.8	-0.0	7993.5	-2051.8	1.113	1.000	1.000	1.000	15292.1	137895.1	11.1	
120	6737.8	-0.0	7768.2	-1211.0	1.113	1.000	1.000	1.000	14706.8	137895.1	10.7	
120	6737.8	-0.0	7768.2	1211.0	1.000	1.000	1.000	1.000	14706.8	137895.1	10.7	
130	6737.8	-0.0	1120.6	-1211.0	1.000	1.000	1.000	1.000	8223.1	137895.1	6.0	
130	6737.8	-0.0	1120.6	1211.0	1.000	1.000	1.000	1.000	8223.1	137895.1	6.0	
140	6737.8	-0.0	5646.2	-1211.0	1.000	1.000	1.000	1.000	12618.7	137895.1	9.2	
140	6737.8	-0.0	5646.2	1211.0	1.000	1.000	1.000	1.000	12618.7	137895.1	9.2	
148	6737.8	-0.0	347.8	-1211.0	1.000	1.000	1.000	1.000	7488.1	137895.1	5.4	
148	6737.8	-0.0	347.8	1211.0	1.113	1.000	1.000	1.000	7488.1	137895.1	5.4	
149	6737.8	-0.0	1907.2	-889.6	1.113	1.000	1.000	1.000	8826.2	137895.1	6.4	
149	6737.8	-0.0	1907.2	889.6	1.113	1.000	1.000	1.000	8826.2	137895.1	6.4	
150	6737.8	0.0	3087.5	143.3	1.113	1.000	1.000	1.000	9829.5	137895.1	7.1	
150	6737.8	0.0	3087.5	-143.3	1.000	1.000	1.000	1.000	9829.5	137895.1	7.1	
160	6737.8	0.0	5189.9	143.3	1.000	1.000	1.000	1.000	11931.2	137895.1	8.7	
160	6737.8	0.0	5189.9	-143.3	1.000	1.000	1.000	1.000	11931.2	137895.1	8.7	
170	6737.8	0.0	4660.1	143.3	1.000	1.000	1.000	1.000	11401.5	137895.1	8.3	
170	6737.8	0.0	4660.1	-143.3	1.000	1.000	1.000	1.000	11401.5	137895.1	8.3	

Job:: 1650-2-311

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B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

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CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 3 (SUS) W+P1

[illegible]

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23
 Job:: 1650-2-311
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B31.3 STRESSES REPORT: Stresses on Elements
 CASE 4 (EXP) L4=L1-L3

Piping Code (1 of 1): B31.3 -2016, Jan 31, 2017

The SLP column shows the longitudinal pressure stress.

Stresses Evaluation CHECK PASSED : LOADCASE 4 (EXP) L4=L1-L3

Highest Stresses: (KPa)
 Ratio (%): 0.1 @Node 178
 Code: 169.6 Allowable: 337382.8
 F/A 1.2 @Node 220
 Bending 169.1 @Node 178
 Torsion 69.5 @Node 180
 SIF/Index In-Plane 1.5 @Node 1013
 SIF/Index Out-Plane 1.2 @Node 1013
 SIF/Index Torsion 1.0 @Node 20
 SIF/Index Axial 1.0 @Node 20

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out- Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
10												
20												
20		0.0	0.0	-0.0	1.000	1.000	1.000	1.000	0.0	339770.1	0.0	
30		0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	339457.5	0.0	
30		0.0	0.0	-0.0	1.000	1.000	1.000	1.000	0.0	339457.5	0.0	
40		0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	337547.5	0.0	
40		0.0	0.0	-0.0	1.000	1.000	1.000	1.000	0.0	337547.5	0.0	
50		0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	332703.8	0.0	
50		0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	332703.8	0.0	

Job:: 1650-2-311

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B31.3 STRESSES REPORT: Stresses on Elements

CASE 4 (EXP) L4=L1-L3

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CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

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B31.3 STRESSES REPORT: Stresses on Elements

CASE 4 (EXP) L4=L1-L3

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
109		0.0	2.0	-2.2	1.000	1.000	1.000	1.000	4.9	328943.6	0.0	
1000		0.0	0.7	2.2	1.000	1.000	1.000	1.000	4.5	335150.8	0.0	
1000												
1005												
1005		0.0	2.1	-2.2	1.000	1.000	1.000	1.000	4.9	332131.7	0.0	
1010		0.0	2.9	2.2	1.000	1.000	1.000	1.000	5.3	331886.7	0.0	
1010		-0.0	3.9	0.0	1.000	1.000	1.000	1.000	3.9	331780.5	0.0	
2000		-0.0	1.1	-0.0	1.000	1.000	1.000	1.000	1.1	313159.8	0.0	
2000												
2005												
2005												
2010												
2010		-0.0	0.6	-0.0	1.000	1.000	1.000	1.000	0.6	323550.4	0.0	
2011		-0.0	0.4	0.0	1.000	1.000	1.000	1.000	0.4	335272.7	0.0	
2011												
2013												
2013												
2014												
2014												
2012												
2012		-0.0	0.1	-0.0	1.000	1.000	1.000	1.000	0.1	325796.7	0.0	
2016		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	321409.1	0.0	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 4 (EXP) L4=L1-L3

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
2016		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	321409.1	0.0	
2015		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	331179.5	0.0	
2015		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	331179.5	0.0	
2020		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	328943.4	0.0	
2020		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	328943.4	0.0	
2025		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	329980.5	0.0	
2025												
2030												
2030		-0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	330672.4	0.0	
2035		0.0	0.0	0.0	1.000	1.000	1.000	1.000	0.0	339899.7	0.0	
1010		0.0	8.3	1.4	1.000	1.000	1.000	1.000	8.8	332515.5	0.0	
1013		0.0	10.6	-1.4	1.000	1.000	1.000	1.000	11.0	334714.7	0.0	
1013		0.0	13.1	1.4	1.484	1.237	1.000	1.000	13.4	334714.7	0.0	
1014		0.0	7.4	-4.9	1.484	1.237	1.000	1.000	12.2	331328.8	0.0	
1014		0.0	7.4	4.9	1.484	1.237	1.000	1.000	12.2	331328.8	0.0	
1015		0.0	2.7	-5.6	1.484	1.237	1.000	1.000	11.6	329931.2	0.0	
1015		0.0	2.2	5.6	1.000	1.000	1.000	1.000	11.5	329931.2	0.0	
1020		0.0	0.1	-5.6	1.000	1.000	1.000	1.000	11.3	333463.8	0.0	
1020		0.0	0.1	5.6	1.000	1.000	1.000	1.000	11.3	333463.8	0.0	
1025		0.0	2.8	-5.6	1.000	1.000	1.000	1.000	11.6	334461.4	0.0	
1025		0.0	2.8	5.6	1.000	1.000	1.000	1.000	11.6	334461.4	0.0	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 4 (EXP) L4=L1-L3

[illegible]

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 4 (EXP) L4=L1-L3

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
109		0.0	4.2	1.0	1.000	1.000	1.000	1.000	4.6	330495.5	0.0	
110		0.0	5.1	-1.0	1.000	1.000	1.000	1.000	5.5	331116.8	0.0	
110		0.0	6.4	1.0	1.484	1.237	1.000	1.000	6.7	331116.8	0.0	
119		0.0	6.2	1.1	1.484	1.237	1.000	1.000	6.6	329445.7	0.0	
119		0.0	6.2	-1.1	1.484	1.237	1.000	1.000	6.6	329445.7	0.0	
120		0.0	2.4	2.5	1.484	1.237	1.000	1.000	5.6	330031.1	0.0	
120		0.0	1.9	-2.5	1.000	1.000	1.000	1.000	5.4	330031.1	0.0	
130		0.0	0.1	2.5	1.000	1.000	1.000	1.000	5.1	336514.7	0.0	
130		0.0	0.1	-2.5	1.000	1.000	1.000	1.000	5.1	336514.7	0.0	
140		0.0	1.4	2.5	1.000	1.000	1.000	1.000	5.2	332119.2	0.0	
140		0.0	1.4	-2.5	1.000	1.000	1.000	1.000	5.2	332119.2	0.0	
148		0.0	11.8	2.5	1.000	1.000	1.000	1.000	12.9	337249.7	0.0	
148		0.0	14.6	-2.5	1.484	1.237	1.000	1.000	15.5	337249.7	0.0	
149		0.0	6.3	6.0	1.484	1.237	1.000	1.000	13.6	335911.6	0.0	
149		0.0	6.3	-6.0	1.484	1.237	1.000	1.000	13.6	335911.6	0.0	
150		0.0	5.7	6.1	1.484	1.237	1.000	1.000	13.5	334908.4	0.0	
150		0.0	4.6	-6.1	1.000	1.000	1.000	1.000	13.1	334908.4	0.0	
160		0.0	3.4	6.1	1.000	1.000	1.000	1.000	12.7	332806.7	0.0	
160		0.0	3.4	-6.1	1.000	1.000	1.000	1.000	12.7	332806.7	0.0	
170		0.0	122.7	6.1	1.000	1.000	1.000	1.000	123.3	333336.3	0.0	
170		0.0	122.7	-6.1	1.000	1.000	1.000	1.000	123.3	333336.3	0.0	
178		0.0	136.8	6.1	1.000	1.000	1.000	1.000	137.3	337382.8	0.0	

CAESAR II 2019 Ver.11.00.00.4800, (Build 190424) Date: AUG 25, 2022 Time: 11:23

Job:: 1650-2-311

Licensed To:: XGM

B31.3 STRESSES REPORT: Stresses on Elements

CASE 4 (EXP) L4=L1-L3

Node	SLP KPa	F/A KPa	Bending KPa	Torsion KPa	SIF/Index In-Plane	SIF/Index Out-Plane	SIF/Index Torsion	SIF/Index Axial	Code KPa	Allowable KPa	Ratio %	
178		0.0	169.1	-6.1	1.484	1.237	1.000	1.000	169.6	337382.8	0.1	
179		0.0	110.9	53.0	1.484	1.237	1.000	1.000	153.4	337917.7	0.0	
179		0.0	110.9	-53.0	1.484	1.237	1.000	1.000	153.4	337917.7	0.0	
180		-0.0	12.3	69.5	1.484	1.237	1.000	1.000	139.6	337338.5	0.0	
180		-0.0	10.0	-69.5	1.000	1.000	1.000	1.000	139.4	337338.5	0.0	
190		-0.0	27.4	69.5	1.000	1.000	1.000	1.000	141.7	334520.9	0.0	
190		-0.0	27.4	-69.5	1.000	1.000	1.000	1.000	141.7	334520.9	0.0	
198		-0.0	7.6	69.5	1.000	1.000	1.000	1.000	139.3	337136.0	0.0	
198		-0.0	10.3	-69.5	1.484	1.237	1.000	1.000	139.4	337086.0	0.0	
199		-0.6	121.6	48.1	1.484	1.237	1.000	1.000	155.5	337830.2	0.0	
199		-0.6	121.6	-48.1	1.484	1.237	1.000	1.000	155.5	337830.2	0.0	
200		-0.9	165.4	-0.0	1.484	1.237	1.000	1.000	166.2	337711.6	0.0	
200		-0.9	133.7	0.0	1.000	1.000	1.000	1.000	134.6	337711.6	0.0	
208		-0.9	81.7	-0.0	1.000	1.000	1.000	1.000	82.5	334631.2	0.0	
208		-0.9	121.2	0.0	1.484	1.237	1.000	1.000	122.1	334249.2	0.0	
209		-0.5	117.6	0.0	1.484	1.237	1.000	1.000	118.0	334218.0	0.0	
209		-0.5	117.6	-0.0	1.484	1.237	1.000	1.000	118.0	334218.0	0.0	
210		0.0	113.3	0.0	1.484	1.237	1.000	1.000	113.3	334197.1	0.0	
210		0.0	76.3	-0.0	1.000	1.000	1.000	1.000	76.3	334583.4	0.0	
218		0.0	7.6	0.0	1.000	1.000	1.000	1.000	7.6	337327.4	0.0	
218		0.0	11.2	-0.0	1.484	1.237	1.000	1.000	11.2	337251.3	0.0	

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