

PRESSURE VESSEL & COLUMN INSPECTION REPORT

Date: July 25th 2011

Equipment ID: N/S

Plant	Ansel Plant 2		Op Unit			System		
Asset #			Equipment ID	N/S 66130683		Asset Type	3M Pressvess	
Description	NGL Bullet		Prov. Insp. #	A571635 571634		Serial #	NB H0700289	
Manufacturer	Trinity Industries		CRN	U0833.2		Year Built	2007	
MAWP	1724	KPag	@ 51.6	°C		MDMT	-29 °C	
Code	ASME VIII Div I		Fluid Service	Sweet		Sweet/Sour	PWHT HT	
Internal Access	Yes		Insulated	No		Internal Coating		
Operating Pressure	n/s		KPag			Operating Temp	19 °C	

PSV DATA

PSV ID #	Location	Size		Set Pressure	Capacity SCFM / Lbs/Hr / GPM	Manufacturer	Model	Last Service
		Inlet	Outlet					
2-PSV-8000	Top Shell West	4"	6"	1724	49156 SCFM	Anderson Greenwood Crosby	26310-46/S1	2007
2-PSV-8001	Top Shell East	4"	6"	1567	44863 SCFM	Anderson Greenwood Crosby	26310-46/S1	2007

INSPECTION SUMMARY

- Bullet is in good condition
- Both saddles are well supported and securely bolted in place to supports
- Ground connections are present on both saddles
- Minor paint scratch present on exterior surface, metal is exposed with light surface corrosion present
- Ladder and platform is in good condition
- External piping is well supported and in good condition
- 2 PSV's present both with block valves on the inlet side seal locked open. (west PSV)seal# UP176068, (East PSV)seal# UP176044
- Rain caps present on both PSV's
- No leaks detected
- Level gauge is clear, no fouling

RECOMMENDATIONS

- Paint scratched areas where metal is exposed
- Ensure PSV service and calibration as per ABSA AB-506

NONCONFORMANCES / INSPECTION DEFICIENCIES

- None present

INSPECTION PLANNING

Inspection Strategy	Availability	Inspection Interval
Inspection Date July 25 th 2011	Date of Last Inspect	Date of Next Inspect

REPORT CERTIFICATION

The signatures below certify that inspections/tests have been completed in accordance with the identified inspection strategy and that the specified equipment is considered fit for service until the date of next inspection.

Inspected by	_____	Date	_____
Reviewed and Approved by	_____	Date	_____
Criticality Assessment Rerun	_____	Inspection Planning Rerun	_____
Assessed Next Inspection Date	_____		

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PRESSURE VESSEL & COLUMN INSPECTION REPORT

Date: July 25th 2011

Equipment ID: N/S

DETAILED INSPECTION VISUAL EXTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)				
V2	General Corrosion				
V3	General Leaks				
V4	Vibration				
V5	Dissimilar Flange Rating				
V6	Ladder/Stairway				
V7	Heads				
V8	Guy Wires				
V9	Electrical Ground				
V10	Painted Inactive Corrosion				
V11	Coating/Painting				
V12	Expansion Joint or Bellows				
V13	Gauge/Site Glass				
V14	Shell				
V15	Jacket				
V21	Support Other (Please explain)				
V22	Foundation				
V23	Anchor Bolts				
V24	Saddle/Skirt				
V25	Davit				
V26	Fireproofing				
V31	Connections Other (Please explain)				
V32	Small Branches				
V33	Nozzles				
V34	Manways				
V35	Reinforcing Pads				
V36	Inadequate Thread Engagement				
V37	Bolting				
V38	Flanges				
V39	Leak Clamps				
V41	Insulation Other (Please explain)				
V42	Damage				
V43	Penetrations				
V44	Insulation Jacket				
V45	Banding				
V46	Seals/Joints				
V51	Relief Devices Other (Please explain)				
V52	Corrosion				
V53	Leaks				
V54	Restricted Inlet/Outlet				
V55	Manual Operation Lever				

PRESSURE VESSEL & COLUMN INSPECTION REPORT

Date: July 25th 2011

Equipment ID: N/S

DETAILED INSPECTION VISUAL INTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)				
V2	Corrosion (depth, length, width)				
V3	Erosion				
V4	Distortion				
V5	Blisters				
V6	Deposits				
V7	Heads				
V8	Welds				
V9	Nozzles				
V10	Shell				
V11	Gasket Surfaces				
V21	Internals Other (Please explain)				
V22	Demister				
V23	Baffle/Wier				
V24	Sparger				
V25	Thermowells				
V26	Metallic Linings				
V27	Nonmetallic Linings				
V28	Trays				
V29	Tray Rings				
V30	Other Welded Attachments				

DETAILED INSPECTION OTHER TECHNIQUES

ID	Location	Observation/Measurement	Acceptance Criteria	NCR	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

DETAILED INSPECTION UT THICKNESS

CML	Nom. Thk	Current Reading	Short Term Corr Rate	Long Term Corr Rate	Remaining Life	Comments
See Team UT Reports						

PRESSURE VESSEL & COLUMN INSPECTION REPORT

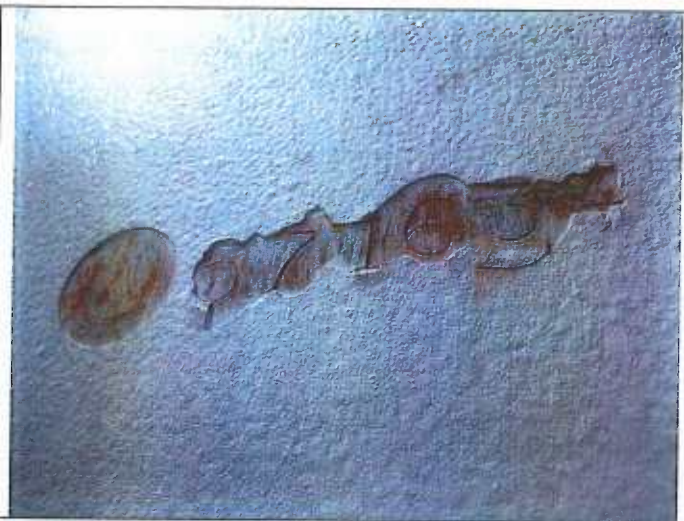
Date: July 25th 2011

Equipment ID: N/S

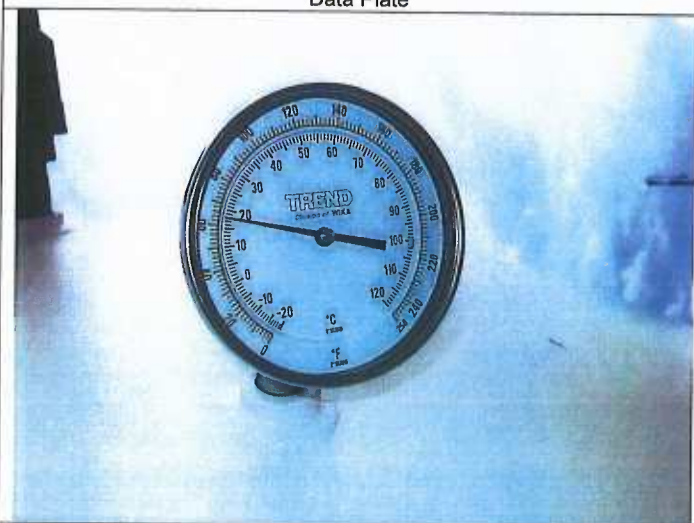
PHOTOS



Data Plate



A#



Temperature Gauge



Overview



Overview



Scratches at center of bullet

PRESSURE VESSEL & COLUMN INSPECTION REPORT

Date: July 25th 2011

Equipment ID: N/S



Overview



Overview



East Supports



West Supports



External piping

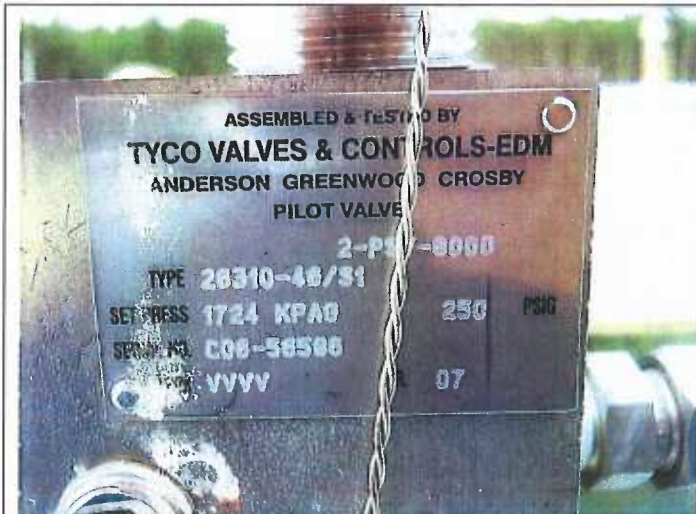


West PSV data plate

PRESSURE VESSEL & COLUMN INSPECTION REPORT

Date: July 25th 2011

Equipment ID: N/S



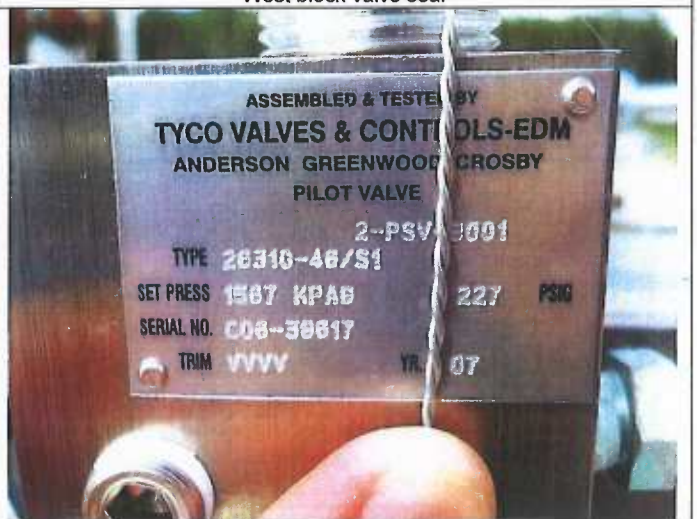
West PSV pilot data



West block valve seal



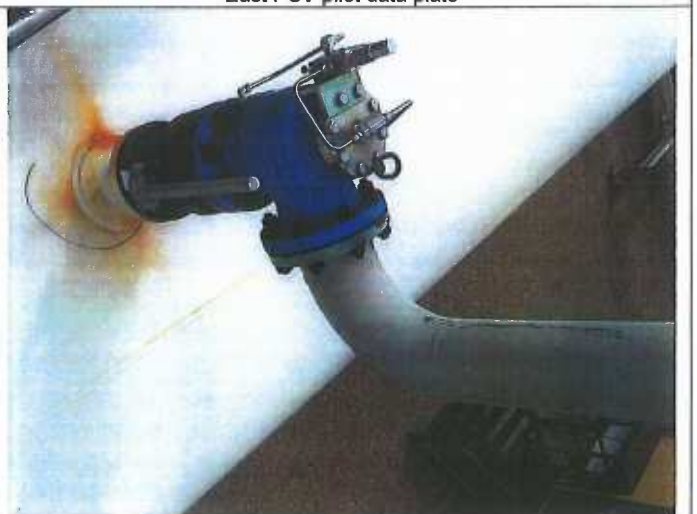
East PSV data plate



East PSV pilot data plate



East block valve seal



Top valve overview

PRESSURE VESSEL & COLUMN INSPECTION REPORT

Date: July 25th 2011

Equipment ID: N/S



Top overview

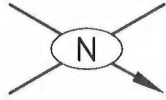


Top valve

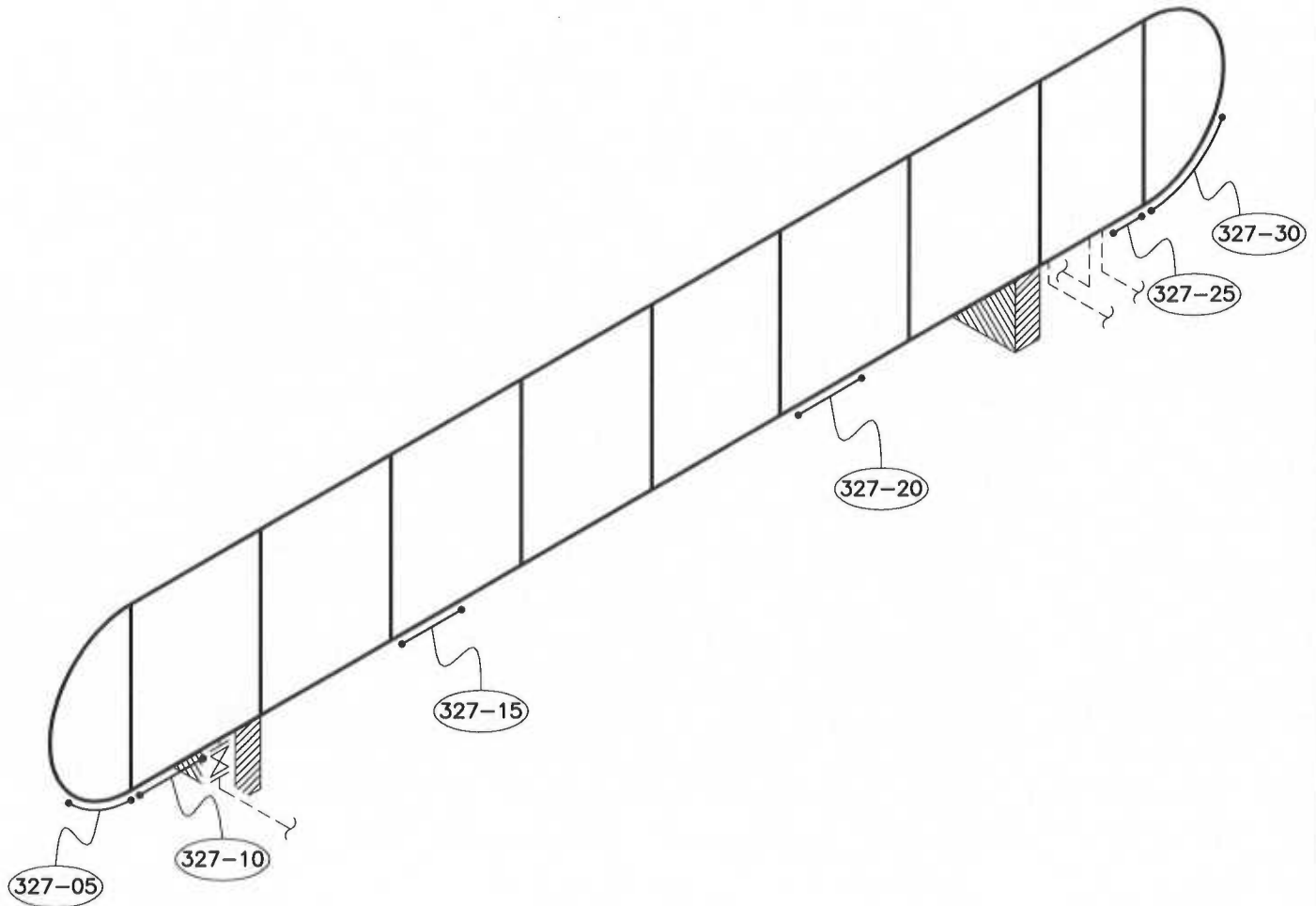
TEAM

Industrial Services

Inspection Services Canada



P&ID. # _____
REF. # _____



VESSEL DATA

P.E. No. N/S Serial No. NBH0700289 Prov. Reg. No. A0571634 C.R.N. U0873.2
MFR. TRINITY INDUSTRIES Code/Div. ASME VIII DIV.1 Para N/S Code Stamp U
Yr. Bld. 2007 Manway YES Vessel Size 120" X 1200" Service SWEET PWHT YES
PSV# N/S SAP# N/S RT 4 Insulated NO

Nominal Thickness & Material

Head: 12.4mm Mat'l: SA-516-70 C.A.: N/S
Head: _____
Shell: 21.0mm SA-516-70 N/S
Shell: _____
Chan Hd: _____
Chan Sh: _____
Boot Hd: _____
Boot Sh: _____

MAWP Shell Side 250PSI @ Temp. 125°F

MAWP Tube Side _____ @ Temp. _____

COMMENTS: _____

Natnl.Board# N/S

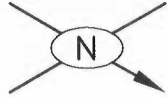
Repairs _____

Reason _____

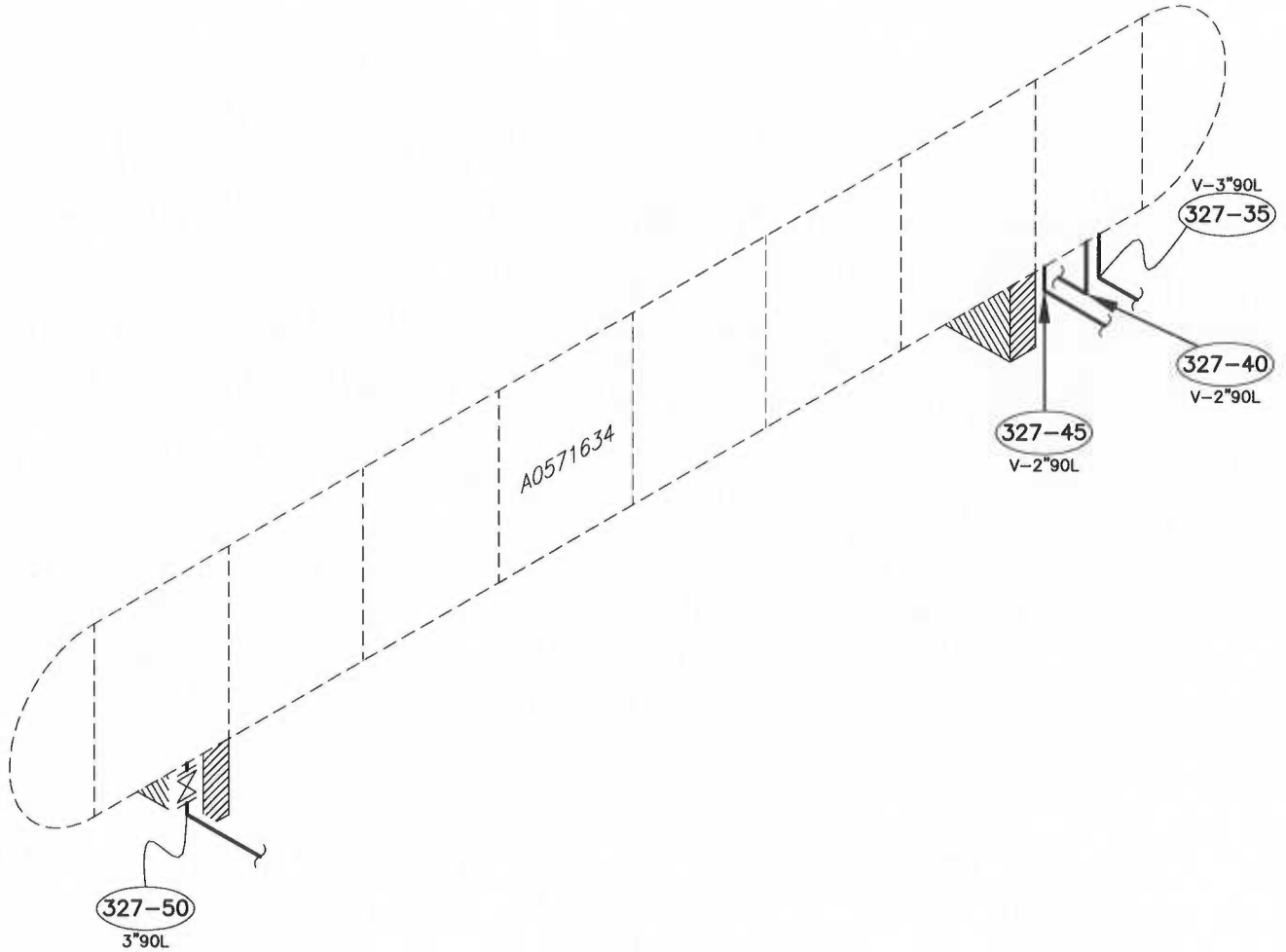
HUSKY ENERGY
ANSEL GAS PLANT #2
LSD 07-27-051-19W5M

NGL BULLET

TECH.: <u>D.S.</u>	REV.DATE: _____	DWG DATE: <u>2011/07</u>
CAD: <u>L.Z.</u>	REVISION: _____	DRAWING: <u>327</u>



P&ID # _____
REF. # _____



PIPING DATA

THICKNESS MEASUREMENT LOCATION:	SIZE	PROC.	LINE #	SPEC.	SCH.	NOM.THK.	CORR. ALLW.	MIN.THK.	CAL.THK.	FLG. RATING
327-35	3"				40	5.5mm	N/S	5.5mm		
327-40	2"				40	3.9mm	N/S	3.9mm		
327-45	2"				80	5.5mm	N/S	5.5mm		
327-50	3"				40	5.5mm	ASTM	4.8mm		

COMMENTS: _____

HUSKY ENERGY
ANSEL GAS PLANT #2
LSD 07-27-051-19W5M

NGL BULLET PIPING

TECH.: D.S.	REV.DATE:	DWG.DATE: 2011/07
CAD: L.Z.	REVISION:	DRAWING: 327A

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		Ser. No.:	NB H0700289
		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Last VE Date	2011-07-25

Description: EAST HEAD E-W

TML: 327-05

Nominal:	12.400	<u>C.A. as per</u>		C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated		L.F.L.:	12.400	Insp. Intv.	12
C.A. Calc.:	--			Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	13.200	_____
Reading 02:	13.200	_____
Reading 03:	13.200	_____
Reading 04:	13.200	_____
Reading 05:	13.200	_____
Reading 06:	13.300	_____
Reading 07:	13.300	_____
Reading 08:	13.200	_____
Reading 09:	13.200	_____
Reading 10:	13.200	_____
Reading 11:	13.200	_____
Reading 12:	13.200	_____

Data Evaluation

Lowest Reading	:	13.200
Average - Low 3	:	13.200
Thk.Rem. Above LFL	:	0.800
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		Ser. No.:	NB H0700289
		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Last VE Date	2011-07-25

Description: EAST SHELL E-W

TML: 327-10

Nominal:	21.000	<u>C.A. as per</u>	C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated	L.F.L.:	21.000	Insp. Intv.	12
C.A. Calc.:	--		Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	21.300	_____
Reading 02:	21.400	_____
Reading 03:	21.400	_____
Reading 04:	21.400	_____
Reading 05:	21.300	_____
Reading 06:	21.300	_____
Reading 07:	21.300	_____
Reading 08:	21.300	_____
Reading 09:	21.300	_____
Reading 10:	21.300	_____
Reading 11:	21.300	_____
Reading 12:	21.300	_____

Data Evaluation

Lowest Reading	:	21.300
Average - Low 3	:	21.300
Thk.Rem. Above LFL	:	0.300
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.: NGL BULLET	Lsd: 07-27-051-19W5M
Prov. Reg.: A5071634	Equip. No.: -----
SKID No.	PSV No.: 2-PSV-8000 / 2-PSV-8001
	Ser. No.: NB H0700289
	Last VE Date 2011-07-25

Description: EAST MID SHELL W-E

TML: 327-15

Nominal:	21.000	<u>C.A. as per</u>	C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated	L.F.L.:	21.000	Insp. Intv.	12
C.A. Calc.:	--		Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	21.300	_____
Reading 02:	21.300	_____
Reading 03:	21.300	_____
Reading 04:	21.300	_____
Reading 05:	21.300	_____
Reading 06:	21.300	_____
Reading 07:	21.300	_____
Reading 08:	21.300	_____
Reading 09:	21.300	_____
Reading 10:	21.300	_____
Reading 11:	21.300	_____
Reading 12:	21.300	_____

Data Evaluation

Lowest Reading	:	21.300
Average - Low 3	:	21.300
Thk.Rem. Above LFL	:	0.300
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Ser. No.:	NB H0700289
		Last VE Date	2011-07-25

Description: WEST MID SHELL W-E

TML: 327-20

Nominal:	21.000	C.A. as per		C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated		L.F.L.:	21.000	Insp. Intv.	12
C.A. Calc.:	--			Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	22.000	_____
Reading 02:	22.000	_____
Reading 03:	22.000	_____
Reading 04:	22.000	_____
Reading 05:	22.000	_____
Reading 06:	21.900	_____
Reading 07:	22.000	_____
Reading 08:	22.100	_____
Reading 09:	22.100	_____
Reading 10:	22.100	_____
Reading 11:	22.100	_____
Reading 12:	22.100	_____

Data Evaluation

Lowest Reading	:	21.900
Average - Low 3	:	21.967
Thk.Rem. Above LFL	:	0.900
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Ser. No.:	NB H0700289
		Last VE Date	2011-07-25

Description: WEST SHELL W-E

TML: 327-25

Nominal:	21.000	<u>C.A. as per</u>	C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated	L.F.L.:	21.000	Insp. Intv.	12
C.A. Calc.:	--		Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	21.600	_____
Reading 02:	21.700	_____
Reading 03:	21.700	_____
Reading 04:	21.700	_____
Reading 05:	21.700	_____
Reading 06:	21.700	_____
Reading 07:	21.800	_____
Reading 08:	21.700	_____
Reading 09:	21.800	_____
Reading 10:	21.700	_____
Reading 11:	21.800	_____
Reading 12:	21.900	_____

Data Evaluation

Lowest Reading	:	21.600
Average - Low 3	:	21.667
Thk.Rem. Above LFL	:	0.600
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Ser. No.:	NB H0700289
		Last VE Date	2011-07-25

Description: WEST HEAD W-E

TML: 327-30

Nominal:	12.400	C.A. as per		C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated		L.F.L.:	12.400	Insp. Intv.	12
C.A. Calc.:	--			Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	13.500	_____
Reading 02:	13.600	_____
Reading 03:	13.500	_____
Reading 04:	13.600	_____
Reading 05:	13.700	_____
Reading 06:	13.600	_____
Reading 07:	13.600	_____
Reading 08:	14.000	_____
Reading 09:	14.000	_____
Reading 10:	14.000	_____
Reading 11:	14.000	_____
Reading 12:	13.900	_____

Data Evaluation

Lowest Reading	:	13.500
Average - Low 3	:	13.533
Thk.Rem. Above LFL	:	1.100
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

Description: VESSEL 3"90L T-B

TML: 327-35

PID #:

Nominal:	5.500	C.A. as per		C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated		L.F.L.:	5.500	Insp. Intv.	12
C.A. Calc.:	--			Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	5.800	_____
Reading 02:	5.600	_____
Reading 03:	5.600	_____
Reading 04:	5.700	_____
Reading 05:	5.700	_____

Data Evaluation

Lowest Reading	:	5.600
Average - Low 3	:	5.633
Thk.Rem. Above LFL	:	0.100
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Ser. No.:	NB H0700289
		Last VE Date	2011-07-25

Description: VESSEL 2"90L T-B

TML: 327-40***

PID #:

Nominal:	3.900	C.A. as per	C.A. L.F.L.:	0.000	Con't Service:	NO
t Min.:	--	Not Stated	L.F.L.:	3.900	Insp. Intv.	0
C.A. Calc.:	--		Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	3.500	_____
Reading 02:	3.500	_____
Reading 03:	3.500	_____
Reading 04:	3.600	_____
Reading 05:	3.700	_____

Data Evaluation

Lowest Reading : 3.500
Average - Low 3 : 3.500
Thk.Rem. Above LFL : ***-0.400
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :

Description: VESSEL 2"90L T-B

TML: 327-45

PID #:

Nominal:	5.500	C.A. as per	C.A. L.F.L.:	0.000	Con't Service:	YES
t Min.:	--	Not Stated	L.F.L.:	5.500	Insp. Intv.	12
C.A. Calc.:	--		Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	5.600	_____
Reading 02:	5.600	_____
Reading 03:	5.600	_____
Reading 04:	5.700	_____
Reading 05:	5.900	_____

Data Evaluation

Lowest Reading : 5.600
Average - Low 3 : 5.600
Thk.Rem. Above LFL : 0.100
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :

HUSKY ENERGY
ANSEL GAS PLANT #2 - (006)
07-27-051-19W5M - (01)

TEAM Industrial Services

Item Desc.:	NGL BULLET	Lsd:	07-27-051-19W5M
Prov. Reg.:	A5071634	Equip. No.:	-----
SKID No.		Ser. No.:	NB H0700289
		PSV No.:	2-PSV-8000 / 2-PSV-8001
		Last VE Date	2011-07-25

Description: 3"90L T-B

TML: 327-50

PID #:

Nominal:	5.500	C.A. as per		C.A. L.F.L.:	0.688	Con't Service:	YES
t Min.:	--	ASTM		L.F.L.:	4.812	Insp. Intv.	12
C.A. Calc.:	--			Mths.To L.F.L.:		Add'l Assm't:	YES

Survey Dates: 11-07-01

Reading 01:	5.700	_____
Reading 02:	5.700	_____
Reading 03:	5.700	_____
Reading 04:	5.800	_____
Reading 05:	5.800	_____

Data Evaluation

Lowest Reading	:	5.700
Average - Low 3	:	5.700
Thk.Rem. Above LFL	:	0.888
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	
