

Location Name:	RAVEN CREEK	LSD:	2-20-50-18 W5M
A#:	648364	Equipment/Tag No.	
Equipment Description:	GLYCOL CONTACTOR		
Manufacturer:	SPECTRUM PROCESS SYSTEMS		
Serial Number:	14-05110-31	CRN:	W6436.21
Shell MAWP:	1415	PSI	Shell Design Temp: 150 °F
Tube MAWP:	1415	PSI	Tube Design Temp: 200 °F
Shell Material:	SA-516-70N		Head Material: SA-516-70N
Shell Thickness:	31.75	mm	Head Thickness: 47.63 mm
Corrosion Allowance:	1.5875	mm	Date Built: 2015
Size:	762	mm	Pipe / Rolled Plate: PLATE
RT:	1		

NOTES: NO ACCESS TO 00,05,10,15,20,25,45,BOTTOM HEAD OR OPPOSITE SIDE OF INLET





STREAMLINE
INSPECTION LTD.





Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: Feb 10, 2015

Inspector: D. Skeard

LSD:	2-20-50-18 W5M	Area:	RAVEN CREEK	Location:	COMPRESSOR STATION
A #:	648364	Tag Number:		Vessel Name:	GLYCOL CONTACTOR
CRN:	W6436.21	Year Built:	2015	Serial Number:	14-05110-31
RT:	1	Vessel CA:	1.588 mm	Manufacturer:	SPECTRUM PROCESS SYSTEMS
		Shell MAWP:	1415 PSI	Tube MAWP:	1415 PSI
		MAWTF:	150 °F	MAWTF:	200 °F
					Pipe/Plate
					PLATE

TML Description		Baseline				Material:	SA-516-70N		
00	HEAD	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	Ellipsoidal	Min	OBSTR.	46.038	1.588	47.625	0.000	0.000	
OD:	762	Avg	OBSTR.						
Spec:	ASME VIII Div.1	Comments:	NO ACCESS				Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	SA-516-70N		
05	SHELL	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	Cylindrical	Min	OBSTR.	30.163	1.588	31.750	0.000	0.000	
OD:	762	Avg	OBSTR.						
Spec:	ASME VIII Div.1	Comments:	NO ACCESS				Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	SA-516-70N		
10	SHELL	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	Cylindrical	Min	OBSTR.	30.163	1.588	31.750	0.000	0.000	
OD:	762	Avg	OBSTR.						
Spec:	ASME VIII Div.1	Comments:	NO ACCESS				Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	SA-516-70N		
15	SHELL	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	Cylindrical	Min	OBSTR.	30.163	1.588	31.750	0.000	0.000	
OD:	762	Avg	OBSTR.						
Spec:	ASME VIII Div.1	Comments:	NO ACCESS				Remaining Life:		
							Retirement Date:		



Ultrasonic Corrosion Survey

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Survey Name: Husky Energy

Date: Feb 10, 2015

Inspector: D. Skeard

LSD:	2-20-50-18 W5M	Area:	RAVEN CREEK	Location:	COMPRESSOR STATION
A #:	648364	Tag Number:		Vessel Name:	GLYCOL CONTACTOR
CRN:	W6436.21	Year Built:	2015	Serial Number:	14-05110-31
RT:	1	Vessel CA:	1.588 mm	Manufacturer:	SPECTRUM PROCESS SYSTEMS
		Shell MAWP:	1415 PSI	Tube MAWP:	1415 PSI
		MAWTF:	150 °F	MAWTF:	200 °F
					Pipe/Plate
					PLATE
TML Description		Baseline		Material: SA-516-70N	
20	SHELL	2015		Flag	CA
Shape:	Cylindrical	Min	OBSTR.	30.163	1.588
OD:	762	Avg	OBSTR.		
Spec:	ASME VIII Div.1	Comments:	NO ACCESS	Nominal	31.750
				T Min	
				STCR mm/yr	0.000
				LTCR mm/yr	0.000
				Remaining Life:	
				Retirement Date:	
TML Description		Baseline		Material: SA-516-70N	
25	SHELL	2015		Flag	CA
Shape:	Cylindrical	Min	OBSTR.	30.163	1.588
OD:	762	Avg	OBSTR.		
Spec:	ASME VIII Div.1	Comments:	NO ACCESS	Nominal	31.750
				T Min	
				STCR mm/yr	0.000
				LTCR mm/yr	0.000
				Remaining Life:	
				Retirement Date:	
TML Description		Baseline		Material: SA-516-70N	
30	SHELL	2015		Flag	CA
Shape:	Cylindrical	Min	32.28	30.163	1.588
OD:	762	Avg	32.46		
Spec:	ASME VIII Div.1	Comments:		Nominal	31.750
				T Min	
				STCR mm/yr	0.000
				LTCR mm/yr	0.000
				Remaining Life:	
				Retirement Date:	
TML Description		Baseline		Material: SA-516-70N	
35	SHELL	2015		Flag	CA
Shape:	Cylindrical	Min	32.36	30.163	1.588
OD:	762	Avg	32.44		
Spec:	ASME VIII Div.1	Comments:	INCLUSION NOTED	Nominal	31.750
				T Min	
				STCR mm/yr	0.000
				LTCR mm/yr	0.000
				Remaining Life:	
				Retirement Date:	



Ultrasonic Corrosion Survey

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Survey Name: Husky Energy

Date: Feb 10, 2015

Inspector: D. Skeard

LSD:	2-20-50-18 W5M	Area:	RAVEN CREEK		Location:	COMPRESSOR STATION				
A #:	648364	Tag Number:			Vessel Name:	GLYCOL CONTACTOR				
CRN:	W6436.21	Year Built:	2015		Serial Number:	14-05110-31				
RT:	1	Vessel CA:	1.588	mm	Manufacturer:	SPECTRUM PROCESS SYSTEMS				
		Shell MAWP:	1415	MAWTF:	150	Tube MAWP:	1415	MAWTF:	200	Pipe/Plate
			PSI		°F		PSI		°F	PLATE
TML Description			Baseline			Material: SA-516-70N				
40	SHELL		2015		Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr
Shape:	Cylindrical	Min	31.90		30.163	1.588	31.750		0.000	0.000
OD:	762	Avg	32.13	Remaining Life:						
Spec:	ASME VIII Div.1	Comments:	Retirement Date:							
TML Description			Baseline			Material: A-234-WPB				
45	PIPING		2015		Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr
Shape:	90° Elbow	Min	OBSTR.		#N/A	#N/A	#N/A		0.000	0.000
OD:	168.275	Avg	OBSTR.	Remaining Life:						
Spec:	ASME B31.3	Comments:	Retirement Date:							
TML Description			Baseline			Material: A-234-WPB				
50	PIPING		2015		Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr
Shape:	90° Elbow	Min	10.80		9.601	1.372	10.973		0.000	0.000
OD:	168.275	Avg	11.00	Remaining Life:						
Spec:	ASME B31.3	Comments:	Retirement Date:							
TML Description			Baseline			Material: A-234-WPB				
55	PIPING		2015		Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr
Shape:	90° Elbow	Min	8.69		7.490	1.070	8.560		0.000	0.000
OD:	114.3	Avg	8.94	Remaining Life:						
Spec:	ASME B31.3	Comments:	Retirement Date:							



Ultrasonic Corrosion Survey

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Date: Feb 10, 2015

Inspector: D. Skeard

LSD:	2-20-50-18 W5M	Area:	RAVEN CREEK	Location:	COMPRESSOR STATION
A #:	648364	Tag Number:		Vessel Name:	GLYCOL CONTACTOR
CRN:	W6436.21	Year Built:	2015	Serial Number:	14-05110-31
RT:	1	Vessel CA:	1.588 mm	Manufacturer:	SPECTRUM PROCESS SYSTEMS
		Shell MAWP:	1415 PSI	Tube MAWP:	1415 PSI
		MAWTF:	150 °F	MAWTF:	200 °F
					Pipe/Plate
					PLATE

TML Description		Baseline				Material:	A-234-WPB		
60	PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	90° Elbow	Min	8.61	7.490	1.070	8.560	0.000	0.000	
OD:	114.3	Avg	8.92						
Spec:	ASME B31.3	Comments:	ASSUMED				Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	A-234-WPB		
65	PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	90° Elbow	Min	9.83	9.601	1.372	10.973	0.000	0.000	
OD:	168.275	Avg	10.82						
Spec:	ASME B31.3	Comments:					Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	A-234-WPB		
70	PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	90° Elbow	Min	10.46	9.601	1.372	10.973	0.000	0.000	
OD:	168.275	Avg	10.67						
Spec:	ASME B31.3	Comments:					Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	A-234-WPB		
75	PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	90° Elbow	Min	4.95	4.845	0.692	5.537	0.000	0.000	
OD:	60.325	Avg	5.31						
Spec:	ASME B31.3	Comments:	ASSUMED				Remaining Life:		
							Retirement Date:		



Ultrasonic Corrosion Survey

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Survey Name: Husky Energy

Date: Feb 10, 2015

Inspector: D. Skeard

LSD:	2-20-50-18 W5M	Area:	RAVEN CREEK	Location:	COMPRESSOR STATION
A #:	648364	Tag Number:		Vessel Name:	GLYCOL CONTACTOR
CRN:	W6436.21	Year Built:	2015	Serial Number:	14-05110-31
RT:	1	Vessel CA:	1.588 mm	Manufacturer:	SPECTRUM PROCESS SYSTEMS
		Shell MAWP:	1415 PSI	Tube MAWP:	1415 PSI
		MAWTF:	150 °F	MAWTF:	200 °F
					Pipe/Plate
					PLATE

TML Description		Baseline				Material:	A-234-WPB		
80	PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	90° Elbow	Min	5.13	4.845	0.692	5.537	0.000	0.000	
OD:	60.325	Avg	5.31						
Spec:	ASME B31.3	Comments:	ASSUMED				Remaining Life:		
							Retirement Date:		

TML Description		Baseline				Material:	A-234-WPB		
85	PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape:	90° Elbow	Min	5.26	4.845	0.692	5.537	0.000	0.000	
OD:	60.325	Avg	5.46						
Spec:	ASME B31.3	Comments:	ASSUMED				Remaining Life:		
							Retirement Date:		

National Board Number: N/A
Mfr. Representative: _____ Date: _____
Authorized Inspector: _____ Date: _____

(A) 648364

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Spectrum Process Systems Inc. 285175 Kleysen Way, Rocky View, Alberta. T1X 0K1 Canada
(Name and address of Manufacturer)
2. Manufactured for Husky Energy. 707-8th Avenue SW. Box 6525, Station "D" Calgary, Alberta T2P 3G7
(Name and address of Purchaser)
3. Location of installation LSD: 02-20-050-18 W5M
(Name and address)
4. Type Vertical Glycid Dehy Package 14-05110-31
(Horizontal, vertical, or sphere) (Tank, separator, jkt. vessel, heat exch., etc.) (Manufacturers serial number)
W6436 .21 V-14-05110-31-001 R.3 N/A 2015
(CRN) Drawing number (National Board number) (Year built)
5. ASME Code, Section VIII, Div. I 2013 Ed.
[Edition and Addenda, if applicable (data)] (Code Case number) [Special service per UG-120(d)]
Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi chamber vessels.
6. Shell: (a) Number of course(s) 4 (b) Overall length 34'-0"

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat-Treatment	
No.	Diameter	Length	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	30" ID	10'-0"	SA-516-70N		1.25"	.0625"	1	Full	100%	1	Full	100%	N/A	N/A
1	30" ID	8'-0"	SA-516-70N		1.25"	.0625"	1	Full	100%	1	Full	100%	N/A	N/A
1	30" ID	8'-0"	SA-516-70N		1.25"	.0625"	1	Full	100%	1	Full	100%	N/A	N/A
1	30" ID	8'-0"	SA-516-70N		1.25"	.0625"	1	Full	100%	1	Full	100%	N/A	N/A

Body Flanges on Shells										Bolting			
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location		Num & Size	Bolting Material	Washer (OD, ID, ink)	Washer Material
-	-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) SA-516-70N (Material spec. number, grade or type) (H.T. - time and temp.)
(b) SA-516-70N (Material spec. number, grade or type) (H.T. - time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Head	1.1875	.0625"	-	-	-	-	2:1	-	-	Concave	-	-	-
(b)	Head	1.1875	.0625"	-	-	-	-	2:1	-	-	Concave	-	-	-

Body Flanges on Heads										Bolting			
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached		Num & Size	Bolting Material	Washer (OD, ID, thk.)	Washer Material
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)													

8. Type of jacket N/A Jacket closure N/A
(Describe as ogee, and weld, bar, etc.)

If bar, give dimensions N/A If bolted, describe or sketch.

9. MAWP 1415 PSIG N/A at max. temp. 150 F N/A Min. design metal temp. -20 F at 1415 PSIG
(Internal) (External) (Internal) (External)

10. Impact test See Remarks (Indicate yes or no and the component(s) impact tested) at test temperature of -20 F

11. Hydro., pneu., or comb. test pressure 1840 PSIG Proof test N/A

Items 12 and 13 to be completed for tube sections.

12. Tubesheet N/A N/A N/A N/A
stationary (material spec. no.) (Diameter (subject to press)) (Nominal thickness) (Corr. allow.) (Attachment (welded or bolted))
N/A N/A N/A N/A
(Floating (material spec. no.)) (Diameter) (Nominal thickness) (Corr. allow.) (Attachment)
13. Tubes N/A N/A N/A N/A
(Material spec. no., grade or type) (O.D.) (Nominal thickness) (Number) (Type (straight or U))

National Board Number: N/A

Mfr. Representative: _____ Date: _____

Authorized Inspector _____ Date _____

FORM U-1 (Cont'd)

Items 14- 18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: (a) No. of course(s) 1 (b) Overall length 40'-0"

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	1.315" OD	40'-0" Total	SA-106B	.358"	.125"	Seamless	None	100%	SW	None	100%	N/A	N/A

Body Flanges on Shells												
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
									Num & Size	Boiling Material	Washer OD, ID, thk	Washer Material
-	-	-	-	-	-	-	-	-	-	-	-	-

15. Heads: (a) N/A (Material spec. number, grade or type) (H.T.- time and temp.) (b) N/A (Material spec. number grade or type) H.T.- time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)														

Body Flanges on Heads												
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting			
									Num & Size	Bolting Material	Washer OD, ID, thk	Washer Material
(a)	-	-	-	-	-	-	-	-	-	-	-	-
(b)												

16. MAWP 1415 PSIG 1415 PSIG at max. temp. 200 F 150 F Min. design metal temp. -20 F at 1415 PSIG
(internal) External Internal External17. Impact test See Remarks [indicate yes or no and the component(s) impact tested] at test temperature of -20 F18. Hydro., pneu., or comb. test pressure 1840 PSI Proof test None

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Gas Inlet/Gas Outlet	2	6" CL600	RFLWN	*	-	1.375"	.0625"	Integral	UW16.1(c)	-	Shell/Head
LSHH/LC/Insp./LSLL	4	4" CL600	RFLWN	*	-	1"	.0625"	Integral	UW16.1(c)	-	Shell
Gly Inlet	1	2" CL900	RFWN	SA-106B	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Shell
Coil in/out	2	1" CL900	RFSW	SA-106B	SA-105N	.358"	.0625"	Integral	UW16.1(c)	Type1	Shell
Gly out/ Tray Insp./PI/TI	15	2" CL600	RFWN	SA-333-6	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Shell
Liq Dump/LG/PSV/spare.	4	2" CL600	RFWN	SA-333-6	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Shell
Insp./Drain/Equalizer	2	2" CL600	RFWN	SA-333-6	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Shell
Drain	1	2" CL600	RFWN	SA-333-6	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Head
X-ray Access	3	2" CL600	RFLWN	*	-	.66"	.0625"	Integral	UW16.1(c)	-	Shell

20. Supports: Skirt Yes Lugs 3 Legs N/A Others N/A Attached Welded to Head
(Yes or no) (Number) (Number) (Describe) (Where and how)21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report (list the name of part, item number, Manufacturer's name, and identifying number):
N/A22. Remarks Production Impact exempt per UG-20(f)(1-5) & UCS -66(a). Tag # V-601Volume: 172.58 Cu.ft (4.9 Cu.M). * SA-350LF2CL1Const. DWG. NO: V-14-05110-31-001 R.3 PSV Installed by other as per UG-125.4" & 2" Blind Mat. SA-105N Studs: SA-193-B7M & Nuts: SA-194-2HM Thread UNC. Size: (7/8*5 3/4") (5/8*4 1/4").

National Board Number: _____

Mfr. Representative: _____ Date: _____

Authorized Inspector _____ Date _____

FORM U-1 (Cont'd)

① 648364

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number 21,356 Expires July 21, 2016Date January 12, 2015 Name Spectrum Process Systems Inc. Signed Hassan
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by ABSA, Alberta of Calgary have inspected the pressure vessel described in this Manufacturer's Data Report on JAN 13 2015, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date JAN 13 2015 Signed Nilanjan Nag Commissions AB 242 NB 12860 A, B
(Authorized Inspector) [National Board (incl. endorsements)]

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements in this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. U Certificate of Authorization Number _____ Expires _____

Date _____ Name _____ Signed _____
(Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by _____ of _____, have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____. By Rig Ring this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ Commissions _____
(Authorized Inspector) National Board (incl. endorsements)]