



**NDT INSPECTION OF AN INLET SEPARATOR PACKAGE
LOCATED AT THE WINDWARD RESOURCES YARD
IN FORT ST. JOHN, B.C.**

September 20th, 2018

***ALTEC INSPECTION LTD.
FORT ST. JOHN, B.C.***

Client: RARE Oilfield Services Report Date: September 20th, 2018
Attn: Tyler Hebblethwaite Report No. 3
C.C.: Rob Gryba
Client P.O. No. _____ Altec Job No. 181276
Client Job No. _____ Inspection Date: September 17th, 2018

Subject: Ultrasonic thickness survey of inlet separator package.

Introduction:

The September 17th, 2018 inspection was a baseline thickness survey (1st by Altec Inspection Ltd.) of the inlet separator package. The package consisted of an inlet separator (A #541584) and associated piping, and a fuel gas scrubber (Serial # 12822). The inspection was completed to determine the general condition of the vessels and associated piping.

The inspection method used was an Ultrasonic straight beam thickness measurement survey. Please find the following enclosed for your review: a brief analysis of the ultrasonic inspection results, a representative drawing indicating the ultrasonic band locations and the physical data collected. All measurements were recorded in inches.

Equipment Utilized:

GE DMS Go Flaw Detector
¼" 7.5 Mhz dual element straight beam probe
½" 5 Mhz Dual element straight beam probe
Couplant utilized: water based (Sonotest gel)

Item Inspected:



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Item Inspected Con't:

Inlet Separator Tag Data:



Fuel Gas Separator Tag Data:



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Test Results:

Inlet Separator:

A total of four (4) vessel bands were inspected for the inlet separator. The inspection consisted of the top head, upper shell, lower shell and lower head. A total of six (6) fittings were inspected for the inlet separator associated piping. One (1) anomaly was found for below nominal readings, see below:

Band # 5 - 2" 90° elbow, indicated a minimum reading of 0.245" or 28.6% below the 0.343" nominal thickness for 2" Sch. 160 material.

The vessel appeared to be in good condition, with all readings found to be near or above the stated nominal thicknesses for the vessel.

All fittings inspected (with the exception of the anomaly discussed above) were found to with-in the +/- 12.5% manufacturer under tolerance for ASTM material.

Fuel Gas Separator:

A total of one (1) vessel bands was inspected for the fuel gas scrubber. The inspection consisted of the upper to lower shell.

A nominal thickness for the shell section was not indicated on the vessel tag data. But ultrasonic inspection indicated uniform internal surfaces with no corrosion / erosion damage suspected.

Conclusion:

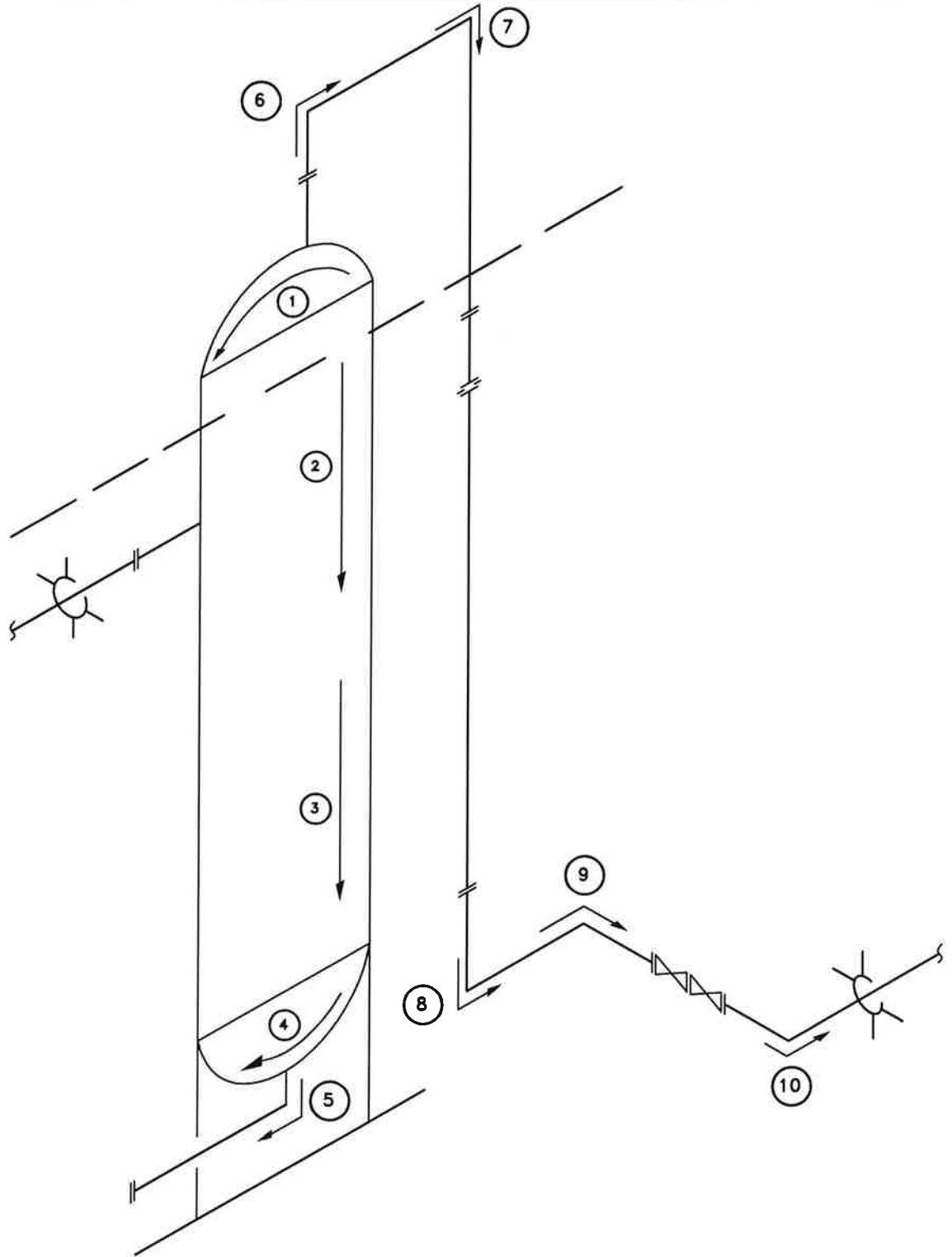
Overall, the inlet separator package was found to be in good condition. The ultrasonic inspection found the vessels to be near or above stated nominal thicknesses and all associated piping (with the exception of the anomaly discussed above) to be with-in the +/- 12.5% manufacturer under tolerance for ASTM material. The inlet separator package is suitable for continued service.

Yours truly,



Justin Bolog, CGSB Level 2 U/T

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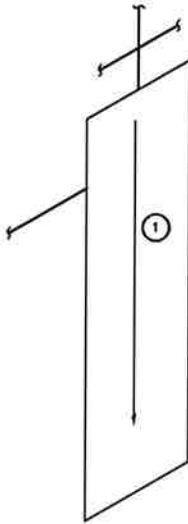


EQUIPMENT DATA	
MAKE:	PENFABCO LTD.
SER. NO.:	PE 9682
CRN NO.:	P2437.213
B.C. NO.:	
ALTA. NO.:	● 541584
MFG. DATE:	2005
MAWP:	1440 PSI @ 100°F
't' SHELL:	
't' HEAD:	
SIZE:	
CORR. ALLOW.:	0.125"
XRAY/STRESS REL.:	U, HT, V, RT1

ALTEC
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BY:	N. NEUPANE	<small>13022 BEATCH PARK ROAD, BOX 280, CHARLE LAKE, W.V. VOC 140</small>
DATE:	SEPT. 19, 2018	

INLET SEPARATOR	
WINDWARD RESOURCES YARD FORT ST. JOHN	
COMPANY:	DRAWING NUMBER:
RARE OILFIELD SERVICES CORP.	SEPARATOR A-541584.DWG



EQUIPMENT DATA	
MAKE:	LARSEN D'AMICO MFG. LTD.
SER. NO.:	12822
CRN NO.:	L9476.213
B.C. NO.:	
ALTA. NO.:	
MFG. DATE:	2005
MAWP:	150 PSI @ 200°F
't' SHELL:	
't' HEAD:	
SIZE:	
CORR. ALLOW.:	0.0625"
XRAY/STRESS REL.:	UM, HT, W, RFS

ALTEC INSPECTION LTD.		13825 BEATON PARK ROAD, BOX 859, CHARLE LAKE, W.V. VDC 140	
		0230785 6295	

FUEL GAS SCRUBBER	
WINDWARD RESOURCES YARD FORT ST. JOHN	
COMPANY:	DRAWING NUMBER:
RARE OILFIELD SERVICES CORP.	FGS S-12822.DWG

RARE Oilfield Services Corp.

File Name: Inlet Separator - A 541584 / FGS S-12822
Description: Vessels & Associated Piping
Probe: 7.5 MHz FH2E
Instrument : DMS Go
Units: INCH
Date: September 17th, 2018

Thickness Data

Band #'s	Size	Sch	Nom.	Point # 1	Point # 2	Point # 3	Point # 4	Point # 5	Point # 6	Point # 7	Point # 8	Point # 9	Point # 10	T _{avg}	T _{min}	% Below Nom.
Inlet Separator - A 541584																
Band #1	HEAD		N/A	1.019	1.006	0.998	0.997	0.997	0.958	0.970	0.964	0.975	0.992	0.989	0.958	N/A
Band #2	SHELL		N/A	1.074	1.063	1.051	1.048	1.045	1.051	1.049	1.035	1.040	1.040	1.052	1.035	N/A
Band #3	SHELL		N/A	1.049	1.046	1.032	1.038	1.022	1.039	1.063	1.062	1.062	1.060	1.044	1.022	N/A
Band #4	HEAD		N/A	1.038	1.004	0.986	0.990	0.986	0.990	0.977	0.973	0.968	1.040	0.993	0.973	N/A
Band #5	2" - 90 ⁰	160	0.343	0.286	0.279	0.245	0.248	0.250	-	-	-	-	-	0.262	0.245	28.6
Band #6	3" - 90 ⁰	80	0.300	0.273	0.279	0.286	0.285	0.296	0.302	-	-	-	-	0.287	0.273	9.0
Band #7	3" - 90 ⁰	80	0.300	0.306	0.302	0.304	0.300	0.305	0.309	-	-	-	-	0.304	0.300	N/A
Band #8	3" - 90 ⁰	80	0.300	0.295	0.292	0.281	0.277	0.271	0.286	-	-	-	-	0.284	0.271	9.7
Band #9	3" - 90 ⁰	80	0.300	0.298	0.299	0.301	0.312	0.308	0.309	-	-	-	-	0.305	0.298	0.7
Band #10	3" - 90 ⁰	80	0.300	0.299	0.300	0.295	0.310	0.309	0.318	-	-	-	-	0.305	0.295	1.7
Fuel Gas Scrubber S-12822																
Band #1	SHELL		N/A	0.198	0.197	0.194	0.206	0.208	0.201	0.203	0.194	0.193	0.188	0.198	0.188	N/A

Notes

T_{avg} Average Thickness reading for given data
T_{min} Minimum thickness reading for given data
 Green background up to 12.5% below Nominal
% Below Yellow background between 12.5% & 35% below Nominal
Nom. Red background indicates over 35% below Nominal
 N/A - Indicates reading above nominal value