



## ULTRASONIC INSPECTION REPORT

DATE:	18-Oct-11	REPORT #:	UET-111018	PAGE 1 of 1
CLIENT:	NUVISTA ENERGY LTD.		ECHO JOB #:	
CONTRACTOR:	NORTHERN MATERIALS ENGINEERING LTD.			
LOCATION:	WEST PEMBINA G.P. LSD: 07-02-48-09W5	PROJECT:		
ITEMS EXAMINED:	BULLET A0185883			
PROCEDURE:	UT-4	CLIENT JOB # (PO, WO, AFE..):		
ACCEPTANCE CRITERIA & SPECIFICATION:	ASME VIII DIV. I APP. 12 & ASME V, ART. 4			

### METHOD

MODE:	<input checked="" type="checkbox"/> Zero Degree	<input checked="" type="checkbox"/> Shear Wave	<input type="checkbox"/> Specialty:							
EQUIPMENT TYPE:	Panametrics Epoch IV	Serial No.:	40194604	Last Calibration:	SEPT 13/11					
CABLE LENGTH:	80"	COUPLANT:	UT-X	3/4" ASME BLOCK SN 10-4030						
CAL BLOCK(S):	<input type="checkbox"/> 1/2" Step	<input checked="" type="checkbox"/> 1" Step	<input checked="" type="checkbox"/> 3/4" ASME	<input type="checkbox"/> 1 1/2" ASME	<input checked="" type="checkbox"/> DSC	<input type="checkbox"/> IIW	<input type="checkbox"/> TEST PIECE:			
REF RELECTOR:	Type:	Side Drilled	Size:	2.5mm	Depth:	1/2 T	Response Ht.:	80% FSH		
	ANGLE	WAVE	FREQ	SIZE	MFG.	SER NO.	RANGE	REF DB	SCAN DB	TL DB
1	0	LONG	5 MHZ	0.250"	Stresstel	01X6LX	25mm	59	+6	65
2	45	SHEAR	2.3 MHZ	0.375"	Sonatest	T029004	100mm	44	+6	50
3	60	SHEAR	2.3 MHZ	0.375"	Technisonic	37308	150mm	45	+6	51
4	70	SHEAR	2.3 MHZ	0.375"	Sonatest	T028707	200mm	47	+6	53

SURFACE CONDITION:  Clean Base Metal  As Ground  Machined  Sand Blast  Painted  Other:

### TEST RESULTS

#### BULLET A0185883

A UT SHEARWAVE INSPECTION WAS CONDUCTED ON BOTH HEAD TO SHELL CIRCS - CIRC 1 AND 7 FROM SHELL SIDE DUE TO WIDE TRANISTION ON SHELL NEXT TO HEAD TO SHELL CIRC CAUSING POOR ACCESS FOR CREEPWAVE INSPECTION (SEE REPORT PAET-111018-2)

**RESULTS:**

NO BACKWALL BREAKING IN-SERVICE INDICATIONS WERE NOTED AT TIME OF INSPECTION.

ALL WELDS INSPECTED ACCEPTABLE AS PER CODE.

Misc Charges	NAME / CERTIFICATION/SIGNATURE EDWIN TYMENSEN - API 510 #27479 CGSB / SNT-TC-1A UT II / MT II / PT II # 11424 	Regular Hours	SEE
		Overtime Hours	TIME
		Shift Premium	SUMMARY
Client: (name/approval)		Kilometers	CET-111017
		Assistant	TYLER B., BILLY N.B.



**ULTRASONIC PHASED ARRAY EXAMINATION REPORT**

DATE:	October 18, 2011	REPORT #	PAET-111018-2	ECHO JOB #:	
CLIENT:	NUVISTA ENERGY LTD				
CONTRACTOR:	NORTHERN MATERIALS ENGINEERING LTD.				
LOCATION:	WEST PEMBINA G.P. LSD: 07-02-48-09W5	PROJECT:	PHASED ARRAY CREEPWAVE ON WELDS		
ITEMS EXAMINED:	BULLET A0185883, ON ALL CIRCS, LONGSEAMS AND NOZZLE WELDS (WITH NO REPADS) - SEE BELOW				
PROCEDURE:	UT-10	CLIENT PO # / JOB #:			
TECHNIQUE:	CREEP24mm.ops, CREEP24mm16mm.ops, CREEP16mm.ops				
ACCEPTANCE CRITERIA:	ASME VIII DIV 1	SPECIFICATION:	ASME V, ART. 4		

**EQUIPMENT AND PARAMETERS**

OMNISCAN		PROBE / WEDGE	PROBE 1	PROBE 2	GROUP SETUP	GROUP 1	GROUP 2	GROUP 3	GROUP 4
MANUFACTURER:	OLYMPUS	PROBE MAKE:	OLYMPUS	OLYMPUS	INDEX OFFSET (mm):	-24	+24 (-/+ 42)	-15 (-/+ 24)	15
MAKE / MODEL:	OMNISCAN MX	PROBE SN:	J0139	D0128	ANGLE(S):	31.5°	31.5°	31.5°	31.5°
S/N:	OMNI-100493	PROBE DESCRIPTION:	5-L-16-9.6X10-A1-P-2.5-OM	5-L-16-9.6X10-A1-P-2.5-OM	# ELEMENTS x PITCH:	6 x 0.60mm	6 x 0.60mm	6 x 0.60mm	6 x 0.60mm
CAL. DATE:	12-May-11	WEDGE TYPE:	ABWX692A	ABWX692A	ELEMENTS USED:	1 THRU 16	1 THRU 16	1 THRU 16	1 THRU 16
MODULE TYPE:	OMNI-M-PA16/128	UMBILICAL LENGTH	5.8m	5.8m	REF. dB:	32	30	32	29
MODULE S/N:	OMNI-200143		GROUP 1 AND 3	GROUP 2 AND 4	SCAN dB:	38	36	38	35
SOFTWARE VERSION:	MXU - 2.0R20		(INDEX OFFSETS IN BRACKETS ARE FOR HEAD TO SHELL CIRCS)		WALL THICKNESS	24mm	24mm	16mm	16mm

SCANNER		CALIBRATION BLOCKS			ADDITIONAL PARAMETERS		
MAKE:	OLYMPUS	TYPE:	CREEP - NOTCH	CREEP - NOTCH	(HEAD TO SHELL CIRC OFFSETS)	SURFACE CONDITION:	PAINTED
MODEL:	HXMT-X03	DIAMETER:				COUPLANT:	WATER
S/N:	893351-03	THICKNESS:	15mm	20mm	25mm	TRANSVERSE SCAN COMPLETED:	YES - ACCEPTABLE
SCAN RESOLUTION:	1mm	S/N:				NORMAL BEAM SCAN COMPLETED:	YES - ACCEPTABLE

**TEST RESULTS**

A UT PHASED ARRAY CREEP WAVE INSPECTION WAS COMPLETED ON BULLET A0185883 ON ALL CIRCS, LONGSEAMS, HEMI-HEAD SEGMENT WELDS AND NOZZLE WELDS (WITH NO REPADS) TO INSPECT FOR BACKWALL BREAKING IN-SERVICE DEFECTS AS REQUESTED BY CLIENT.

WELDS NUMBERED FROM EAST TO WEST. CIRCS SCANNED FROM TOP DEAD CENTER CLOCKWISE LOOKING EAST. LONGSEAMS SCANNED FROM EAST TO WEST.

MANUAL NON-ENCODED CREEPWAVE INSPECTION WAS DONE ON THE FOLLOWING AREAS DUE TO OBSTRUCTIONS TO ENCODED SCANNER:

- AROUND ALL TEES
- EAST HEAD WELD 5 SKEW 90 / 270 FROM 880mm TO 950mm
- EAST HEAD WELD 6 SKEW 90 / 270 FROM 870mm TO 940mm

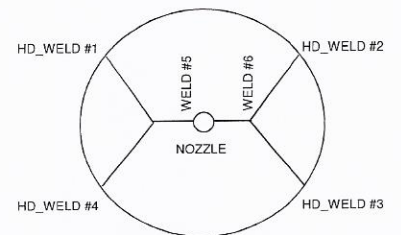
MANUAL NON-ENCODED CREEPWAVE INSPECTION WAS DONE ON THE FOLLOWING NOZZLES:

- 3 X 1.315", 9 X 2.375", 1 X 2.875", 2 X 3.5", 1 X 18" MANWAY

HEMI-HEAD WELDS SCANNED FROM HEAD TO SHELL CIRC INWARDS FOR WELDS 1, 2, 3, 4, AND FROM WELD TRANSECT INWARD TOWARD CENTER NOZZLE ON HEMI-HEAD WELDS 5 AND 6 (SEE BELOW FOR HEMI-HEAD WELD I.D.'S).

ACCESS TO HEAD TO SHELL CIRC FROM SHELL SIDE IS POOR DUE TO WIDE TRANSITION. A CREEP WAVE SCAN WAS DONE WITH PROBE RIGHT UP TO TRANSITION EDGE. A TRADITIONAL UT SHEARWAVE INSPECTION WAS ALSO DONE FROM SHELL SIDE (SEE REPORT UET-111018)

**HEMI-HEAD WELD I.D.'S**



**INDICATION REPORTING:**

ALL SUSPECT INDICATIONS WERE INVESTIGATED BUT ONLY INDICATIONS INTERPRETED AS BACK WALL BREAKING IN-SERVICE DEFECTS WERE REPORTED.

MISC CHARGES	LEVEL III TECHNICIAN	LEVEL III REVIEW	PERFORMING TECHNICIAN	Regular Hours	SEE
- ENCODED CREEP WAVE	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours	TIME
EQUIPMENT	CGSB UT II / MT II / PT II / RT II - #4369		CGSB / SNT-TC-1A UT II / MT II / PT II	Shift Premium	SUMMARY
	SNT-TC-1A UT III / MT III / PT III / RT III		CGSB # 11424 / API 510 #27479	Kilometers	CET-111017
Client Representative:	Signature:		Assistant: TYLER BAITON, BILLY NASH BROUWER		



**ULTRASONIC PHASED ARRAY EXAMINATION REPORT**


DATE: **October 18, 2011** REPORT # **PAET-111018-1** PAGE 2 of 7

CLIENT:	NUVISTA ENERGY LTD		ECHO JOB #:
CONTRACTOR:	NORTHERN MATERIALS ENGINEERING LTD.		
LOCATION:	WEST PEMBINA G.P. LSD: 07-02-48-09W5	PROJECT:	PHASED ARRAY CREEPWAVE ON WELDS
ITEMS EXAMINED:	BULLET A0185883, ON ALL CIRCS, LONGSEAMS AND NOZZLE WELDS (WITH NO REPADS)		
PROCEDURE:	UT-10	CLIENT PO # / JOB #:	
TECHNIQUE:	CREEP24mm.ops, CREEP24mm16mm.ops, CREEP16mm.ops		
ACCEPTANCE CRITERIA:	ASME VIII DIV. 1	SPECIFICATION:	ASME V, ART. 4

**CREEPWAVE TEST RESULTS**

WELD I.D	WALL THICK. (mm)	START SCAN (mm)	END SCAN (mm)	DEFECT I.D.	DEFECT START (mm)	DEFECT LENGTH (mm)	DEFECT HEIGHT (mm)	DEFECT DIST. FROM WELD CENTERLINE	COMMENTS	ACCEPT	REJECT
CIRC 1	16mm / 24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
CIRC 2	24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
CIRC 3	24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
CIRC 4	24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
CIRC 5	24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
CIRC 6	24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
CIRC 7	16mm / 24mm	0	10510						NO IN-SERVICE INDICATIONS NOTED	X	
LS 1	24mm	0	2740						NO IN-SERVICE INDICATIONS NOTED	X	
LS 2	24mm	0	2760						NO IN-SERVICE INDICATIONS NOTED	X	
LS 3	24mm	0	2760						NO IN-SERVICE INDICATIONS NOTED	X	
LS 4	24mm	0	2760						NO IN-SERVICE INDICATIONS NOTED	X	
LS 5	24mm	0	2760						NO IN-SERVICE INDICATIONS NOTED	X	
LS 6	24mm	0	2750						NO IN-SERVICE INDICATIONS NOTED	X	
E HD WELD 1	16mm	0	1960						NO IN-SERVICE INDICATIONS NOTED	X	
E HD WELD 2	16mm	0	1960						NO IN-SERVICE INDICATIONS NOTED	X	
E HD WELD 3	16mm	0	1960						NO IN-SERVICE INDICATIONS NOTED	X	
E HD WELD 4	16mm	0	1960						NO IN-SERVICE INDICATIONS NOTED	X	
E HD WELD 5	16mm	0	950						NO IN-SERVICE INDICATIONS NOTED	X	
E HD WELD 6	16mm	0	940						NO IN-SERVICE INDICATIONS NOTED	X	

MISC CHARGES	LEVEL III TECHNICIAN	LEVEL III REVIEW	PERFORMING TECHNICIAN	Regular Hours
- PHASED ARRAY EQUIPMENT	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours
	CGSB UT II / MT II / PT II / RT II - #4369		CGSB / SNT-TC-1A UT II / MT II / PT II	Shift Premium
	SNT-TC-1A UT III / MT III / PT III / RT III		CGSB # 11424 / API 510 #27479	Kilometers

Client Representative: \_\_\_\_\_ Signature:  Assistant: TYLER BAITON, LANDON OWEN



**ULTRASONIC PHASED ARRAY EXAMINATION REPORT**


DATE: October 18, 2011 REPORT # PAET-111018-1 PAGE 3 of 7

CLIENT:	NUVISTA ENERGY LTD		ECHO JOB #:
CONTRACTOR:	NORTHERN MATERIALS ENGINEERING LTD.		
LOCATION:	WEST PEMBINA G.P. LSD: 07-02-48-09W5	PROJECT:	PHASED ARRAY CREEPWAVE ON WELDS
ITEMS EXAMINED:	BULLET A0185883, ON ALL CIRCS, LONGSEAMS AND NOZZLE WELDS (WITH NO REPADS)		
PROCEDURE:	UT-10	CLIENT PO # / JOB #:	
TECHNIQUE:	CREEP24mm.ops, CREEP24mm16mm.ops, CREEP16mm.ops		
ACCEPTANCE CRITERIA:	ASME VIII DIV. 1	SPECIFICATION:	ASME V, ART. 4

**CREEPWAVE TEST RESULTS**

WELD I.D	WALL THICK. (mm)	START SCAN (mm)	END SCAN (mm)	DEFECT I.D.	DEFECT START (mm)	DEFECT LENGTH (mm)	DEFECT HEIGHT (mm)	DEFECT DIST. FROM WELD CENTERLINE	COMMENTS	ACCEPT	REJECT
W HD WELD 1	16mm	0	1910						NO IN-SERVICE INDICATIONS NOTED	X	
W HD WELD 2	16mm	0	1910						NO IN-SERVICE INDICATIONS NOTED	X	
W HD WELD 3	16mm	0	1910						NO IN-SERVICE INDICATIONS NOTED	X	
W HD WELD 4	16mm	0	1910						NO IN-SERVICE INDICATIONS NOTED	X	
W HD WELD 5	16mm	0	990						NO IN-SERVICE INDICATIONS NOTED	X	
W HD WELD 6	16mm	0	970						NO IN-SERVICE INDICATIONS NOTED	X	
UT - 1		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 2		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 3		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 4		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 5		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 6		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 7		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 8		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 9		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 10		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 11		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 12		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 13		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 14		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	

MISC CHARGES	LEVEL III TECHNICIAN	LEVEL III REVIEW	PERFORMING TECHNICIAN	Regular Hours
PHASED ARRAY EQUIPMENT	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours
	CGSB UT II / MT II / PT II / RT II - #4369		CGSB / SNT-TC-1A UT II / MT II / PT II	Shift Premium
	SNT-TC-1A UT III / MT III / PT III / RT III		CGSB # 11424 / API 510 #27479	Kilometers

Client Representative: \_\_\_\_\_ Signature:  Assistant: TYLER BAITON, LONDON OWEN



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DATE: October 18, 2011 REPORT # PAET-111018-1 PAGE 4 of 7

CLIENT:	NUVISTA ENERGY LTD		ECHO JOB #:
CONTRACTOR:	NORTHERN MATERIALS ENGINEERING LTD.		
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PROCEDURE:	UT-10	CLIENT PO # / JOB #:	
TECHNIQUE:	CREEP24mm.ops, CREEP24mm16mm.ops, CREEP16mm.ops		
ACCEPTANCE CRITERIA:	ASME VIII DIV. 1	SPECIFICATION:	ASME V, ART. 4

CREEPWAVE TEST RESULTS											
WELD I.D	WALL THICK. (mm)	START SCAN (mm)	END SCAN (mm)	DEFECT I.D.	DEFECT START (mm)	DEFECT LENGTH (mm)	DEFECT HEIGHT (mm)	DEFECT DIST. FROM WELD CENTERLINE	COMMENTS	ACCEPT	REJECT
UT - 15		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	
UT - 16		HAND SCAN ENTIRE NOZZLE							NO IN-SERVICE INDICATIONS NOTED	X	

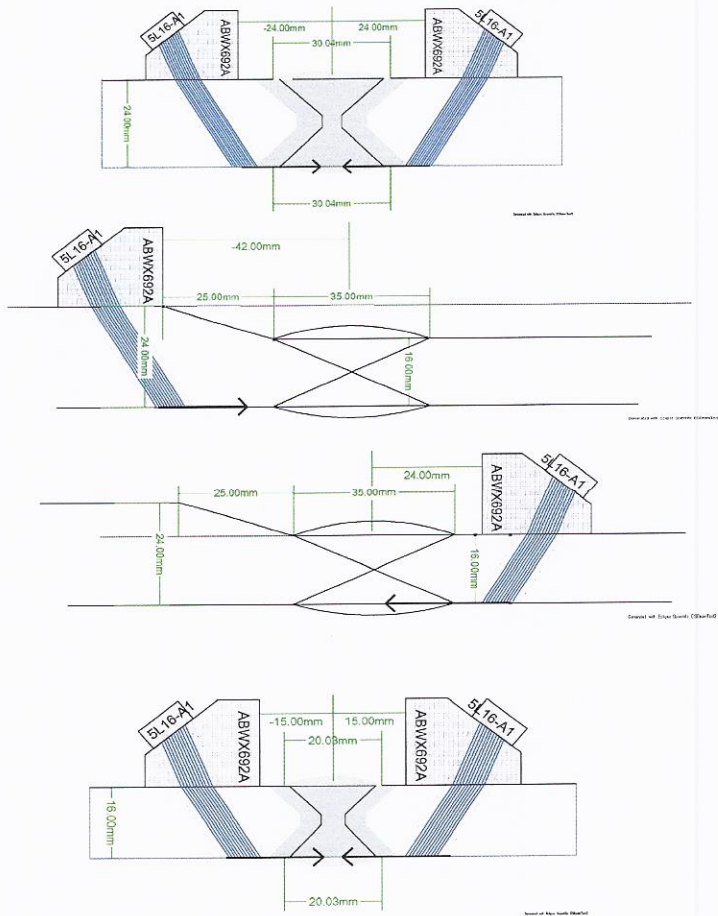
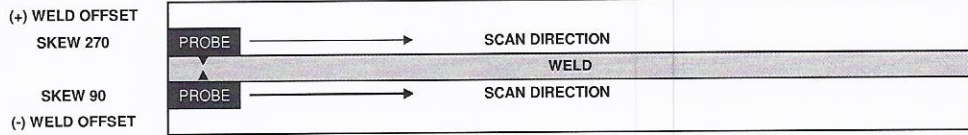
MISC CHARGES	LEVEL III TECHNICIAN	LEVEL III REVIEW	PERFORMING TECHNICIAN	Regular Hours
PHASED ARRAY EQUIPMENT	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours
	CGSB UT II / MT II / PT II / RT II - #4369		CGSB / SNT-TC-1A UT II / MT II / PT II	Shift Premium
	SNT-TC-1A UT III / MT III / PT III / RT III		CGSB # 11424 / API 510 #27479	Kilometers
Client Representative:	Signature:			ASSISTANT: TYLER BAITON, LANDON OWEN



**ULTRASONIC PHASED ARRAY EXAMINATION REPORT**

DATE:	October 18, 2011	REPORT #	PAET-111018-2	PAGE 5 of 7
CLIENT:	NUVISTA ENERGY LTD			ECHO JOB #:
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LOCATION:	WEST PEMBINA G.P. LSD: 07-02-48-09W5	PROJECT:	PHASED ARRAY CREEPWAVE ON WELDS	
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**CREEPWAVE SCAN PLANS**



SHELL TO SHELL CIRC WELDS  
SHELL LONGSEAM WELDS  
SHELL 23.5mm TO 24mm THICK (UT)  
WELDS APPROX. 30mm WIDE  
PROBE SPACING + / - 24mm

HEAD TO SHELL CIRC WELDS  
WELDS APPROX. 35mm WIDE  
25mm WIDE TRANSITION IN SHELL NEXT TO WELD  
SHELL PROBE SPACING + / - 42mm

HEAD TO SHELL CIRC WELDS  
WELDS APPROX. 35mm WIDE  
25mm WIDE TRANSITION IN SHELL NEXT TO WELD  
HEAD PROBE SPACING + / - 24mm

HEMI-HEAD WELDS  
HEADS 16mm TO 17mm THICK (UT)  
WELDS APPROX. 20mm WIDE  
PROBE SPACING + / - 15mm

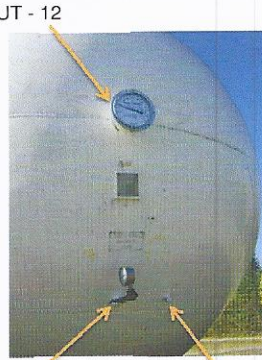
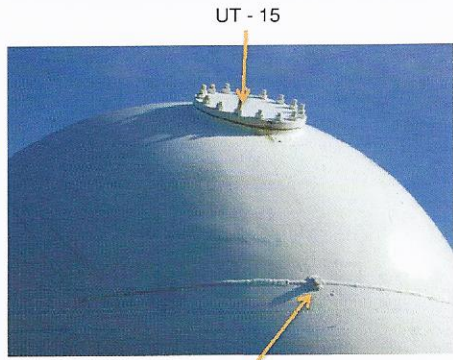
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ENCODED CREEP WAVE	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours	
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Client Representative:			Signature:	Assistant: DARRYL COLEMAN, LONDON OWEN	



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**VESSEL AND NOZZLE LAYOUT**



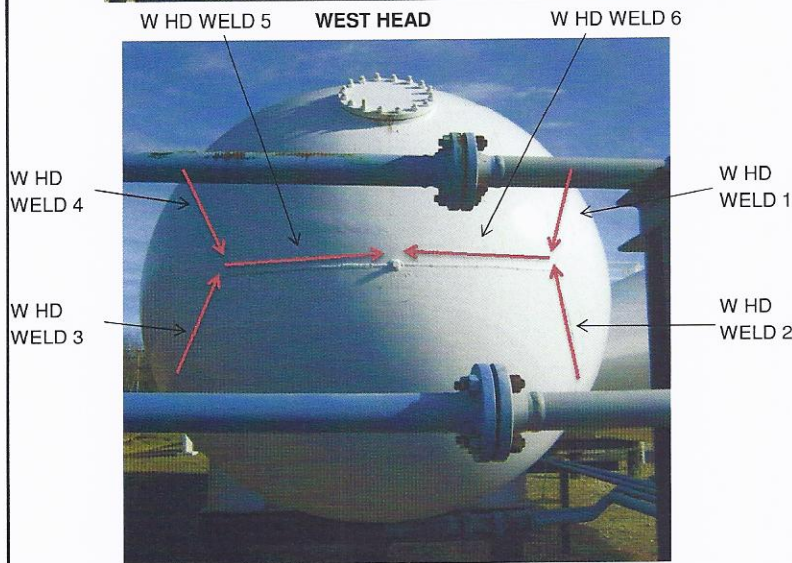
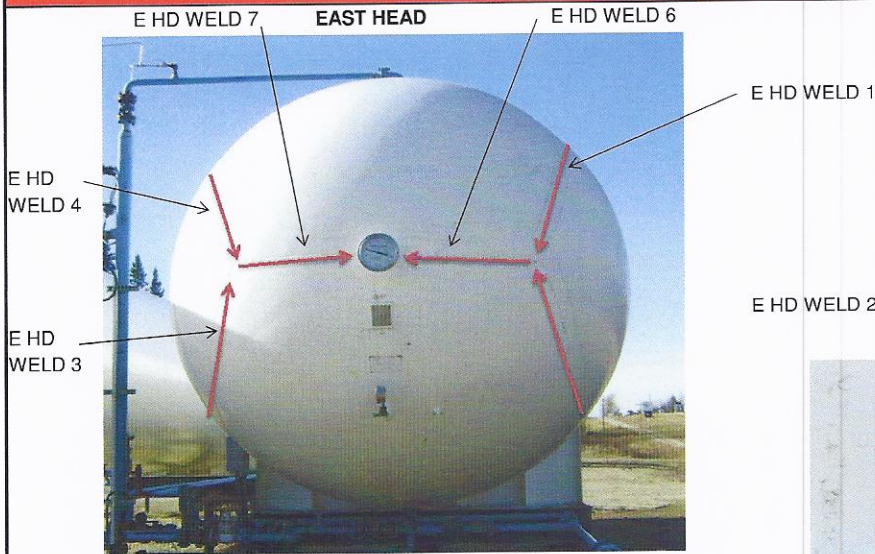
MISC CHARGES	LEVEL III TECHNICIAN	LEVEL III REVIEW	PERFORMING TECHNICIAN	Regular Hours	
ENCODED CREEP WAVE	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours	
EQUIPMENT	CGSB UT II / MT II / PT II / RT II - #4369		CGSB / SNT-TC-1A UT II / MT II / PT II	Shift Premium	
	SNT-TC-1A UT III / MT III / PT III / RT III		CGSB # 11424 / API 510 #27479	Kilometers	
Client Representative:			Signature:	Assistant: DARRYL COLEMAN, LONDON OWEN	



**ULTRASONIC PHASED ARRAY EXAMINATION REPORT**

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**VESSEL AND NOZZLE LAYOUT**



MISC CHARGES	LEVEL III TECHNICIAN	LEVEL III REVIEW	PERFORMING TECHNICIAN	Regular Hours	
ENCODED CREEP WAVE	DARRYL COLEMAN		EDWIN TYMENSEN	Overtime Hours	
EQUIPMENT	CGSB UT II / MT II / PT II / RT II - #4369		CGSB / SNT-TC-1A UT II / MT II / PT II	Shift Premium	
	SNT-TC-1A UT III / MT III / PT III / RT III		CGSB # 11424 / API 510 #27479	Kilometers	
Client Representative:			Signature:	Assistant: DARRYL COLEMAN, LONDON OWEN	





# OmniScan Report

Report Date	Report Version	Setup File Name	Inspection Date	Inspection Version	Save Mode
2011 / 10 / 18	MXU - 2.0R20	CREEP24mm.ops	2011 / 10 / 18	MXU - 2.0R20	Inspection Data
OmniScan Type	OmniScan Serial #	Module Type	Module Serial #	Calibration Due	Data File Name
OmniScan MX	OMNI-100493	OMNI-M-PA16128	OMNI-200143	2012 / 05 / 12	A0185883_CIRC6_N20_7020

Group 1

Probe Characterization

<b>Probe Model</b>	<b>Probe Serial #</b>				
5L16-A1	5L16-A1				
<b>Probe Frequency</b>	<b>Peak Frequency</b>	<b>Wedge Model</b>	<b>Wedge Angle</b>	<b>Probe Aperture</b>	
5.00 MHz	N/A	ABWX739A	39.0°	3.60 mm	
	<b>Lower Frequency</b>	<b>Higher Frequency</b>	<b>Center Frequency</b>	<b>Bandwidth (MHz)</b>	<b>Bandwidth (%)</b>
-6 dB	N/A	N/A	N/A	N/A	N/A
-20 dB	N/A	N/A	N/A	N/A	N/A
<b>Date</b>	<b>Time</b>	<b>Procedure</b>	<b>Calibration Block</b>	<b>Characterization Gain</b>	<b>A%</b>
N/A	N/A	N/A	N/A	N/A	N/A

Setup

<b>A:31.5 Sk:090 L:001</b>					
<b>Beam Delay</b>	<b>Start (Half Path)</b>	<b>Range (Half Path)</b>	<b>Max. PRF</b>	<b>Type</b>	<b>Averaging Factor</b>
9.42 us	-4.74 mm	82.94 mm	272	PA	1
<b>Scale Type</b>	<b>Scale Factor</b>	<b>Video Filter</b>	<b>Pretrig.</b>	<b>Rectification</b>	<b>Band-Pass Filter</b>
Compression	16	Off	0.00 μs	FW	None (0.54 - 22 MHz)
<b>Voltage</b>	<b>Gain</b>	<b>Mode</b>	<b>Wave Type</b>	<b>Sound Velocity</b>	<b>Pulse Width</b>
40 (Low)	38.00 dB	PE (Pulse-Echo)	Shear	3240.0 m/s	100.00 ns
<b>Scan Offset</b>	<b>Index Offset</b>	<b>Skew</b>			
-20.00 mm	-24.00 mm	90.0°			
<b>Gate</b>	<b>Start</b>	<b>Width</b>	<b>Threshold</b>	<b>Synchro</b>	
I	99.75 mm	0.38 mm	20.00 %	Pulse	
A	16.20 mm	21.32 mm	40.00 %	Pulse	
B	105.80 mm	0.38 mm	30.00 %	Pulse	

Calculator

<b>Used Element Qty.</b>	<b>First Element</b>	<b>Last Element</b>	<b>Resolution</b>	<b>Wave Type</b>	<b>Material Velocity</b>
6	1	16	1.0	Shear	3240.0 m/s
<b>Start Angle</b>	<b>Stop Angle</b>	<b>Angle Resolution</b>	<b>Focal Depth</b>	<b>Law Configuration</b>	
31.5°	N/A	N/A	50.00 mm	Linear	

Group 2

Probe Characterization

<b>Probe Model</b>	<b>Probe Serial #</b>				
5L16-A1	5L16-A1				
<b>Probe Frequency</b>	<b>Peak Frequency</b>	<b>Wedge Model</b>	<b>Wedge Angle</b>	<b>Probe Aperture</b>	
5.00 MHz	N/A	ABWX739A	39.0°	3.60 mm	
	<b>Lower Frequency</b>	<b>Higher Frequency</b>	<b>Center Frequency</b>	<b>Bandwidth (MHz)</b>	<b>Bandwidth (%)</b>
-6 dB	N/A	N/A	N/A	N/A	N/A
-20 dB	N/A	N/A	N/A	N/A	N/A
<b>Date</b>	<b>Time</b>	<b>Procedure</b>	<b>Calibration Block</b>	<b>Characterization Gain</b>	<b>A%</b>
N/A	N/A	N/A	N/A	N/A	N/A

Setup

<b>A:31.5 Sk:270 L:001</b>					
<b>Beam Delay</b>	<b>Start (Half Path)</b>	<b>Range (Half Path)</b>	<b>Max. PRF</b>	<b>Type</b>	<b>Averaging Factor</b>
9.42 us	-4.76 mm	82.94 mm	272	PA	1
<b>Scale Type</b>	<b>Scale Factor</b>	<b>Video Filter</b>	<b>Pretrig.</b>	<b>Rectification</b>	<b>Band-Pass Filter</b>
Compression	16	Off	0.00 μs	FW	None (0.54 - 22 MHz)
<b>Voltage</b>	<b>Gain</b>	<b>Mode</b>	<b>Wave Type</b>	<b>Sound Velocity</b>	<b>Pulse Width</b>
40 (Low)	36.00 dB	PE (Pulse-Echo)	Shear	3240.0 m/s	100.00 ns
<b>Scan Offset</b>	<b>Index Offset</b>	<b>Skew</b>			
-20.00 mm	24.00 mm	270.0°			
<b>Gate</b>	<b>Start</b>	<b>Width</b>	<b>Threshold</b>	<b>Synchro</b>	
I	108.27 mm	0.38 mm	20.00 %	Pulse	
A	16.20 mm	21.32 mm	40.00 %	Pulse	
B	116.80 mm	0.38 mm	30.00 %	Pulse	

Calculator

<b>Used Element Qty.</b>	<b>First Element</b>	<b>Last Element</b>	<b>Resolution</b>	<b>Wave Type</b>	<b>Material Velocity</b>
6	1	16	1.0	Shear	3240.0 m/s
<b>Start Angle</b>	<b>Stop Angle</b>	<b>Angle Resolution</b>	<b>Focal Depth</b>	<b>Law Configuration</b>	
31.5°	N/A	N/A	50.00 mm	Linear	

Part

<b>Material</b>	<b>Geometry</b>	<b>Thickness</b>
STEEL, MILD	Plate	24.00 mm

Scan Area

<b>Scan Start</b>	<b>Scan Length</b>	<b>Scan Resolution</b>	<b>Index Start</b>	<b>Index Length</b>	<b>Index Resolution</b>
0.00 mm	7040.00 mm	1.00 mm	0.00 mm	0.00 mm	6.81 mm
<b>Synchro Encoder</b>	<b>Max. Scan Speed</b>				
	272.00 mm/s				
<b>Axis</b>	<b>Encoder</b>	<b>Encoder Type</b>	<b>Encoder Resolution</b>	<b>Polarity</b>	
Scan	1	Quadrature	12.00 step/mm	Normal	
Index	Off	Off	Off	Off	



# OmniScan Report

Report Date	Report Version	Setup File Name	Inspection Date	Inspection Version	Save Mode
2011 / 10 / 18	MXU - 2.0R20	CREEP16mm.ops	2011 / 10 / 18	MXU - 2.0R20	Inspection Data
OmniScan Type	OmniScan Serial #	Module Type	Module Serial #	Calibration Due	Data File Name
OmniScan MX	OMNI-100493	OMNI-M-PA16128	OMNI-200143	2012 / 05 / 12	A0185883_E_HD_WELD5_20_880

Group 1

Probe Characterization

<b>Probe Model</b>	<b>Probe Serial #</b>				
5L16-A1	5L16-A1				
<b>Probe Frequency</b>	<b>Peak Frequency</b>	<b>Wedge Model</b>	<b>Wedge Angle</b>	<b>Probe Aperture</b>	
5.00 MHz	N/A	ABWX739A	39.0°	3.60 mm	
	<b>Lower Frequency</b>	<b>Higher Frequency</b>	<b>Center Frequency</b>	<b>Bandwidth (MHz)</b>	<b>Bandwidth (%)</b>
<b>-6 dB</b>	N/A	N/A	N/A	N/A	N/A
<b>-20 dB</b>	N/A	N/A	N/A	N/A	N/A
<b>Date</b>	<b>Time</b>	<b>Procedure</b>	<b>Calibration Block</b>	<b>Characterization Gain</b>	<b>A%</b>
N/A	N/A	N/A	N/A	N/A	N/A

Setup

<b>A:31.5 Sk:090 L:001</b>					
<b>Beam Delay</b>	<b>Start (Half Path)</b>	<b>Range (Half Path)</b>	<b>Max. PRF</b>	<b>Type</b>	<b>Averaging Factor</b>
9.42 us	-3.20 mm	51.84 mm	272	PA	1
<b>Scale Type</b>	<b>Scale Factor</b>	<b>Video Filter</b>	<b>Pretrig.</b>	<b>Rectification</b>	<b>Band-Pass Filter</b>
Compression	10	Off	0.00 μs	FW	None (0.54 - 22 MHz)
<b>Voltage</b>	<b>Gain</b>	<b>Mode</b>	<b>Wave Type</b>	<b>Sound Velocity</b>	<b>Pulse Width</b>
40 (Low)	38.00 dB	PE (Pulse-Echo)	Shear	3240.0 m/s	100.00 ns
<b>Scan Offset</b>	<b>Index Offset</b>	<b>Skew</b>			
20.00 mm	-15.00 mm	90.0°			
<b>Gate</b>	<b>Start</b>	<b>Width</b>	<b>Threshold</b>	<b>Synchro</b>	
I	99.75 mm	0.38 mm	20.00 %	Pulse	
A	11.09 mm	12.79 mm	40.00 %	Pulse	
B	103.80 mm	0.38 mm	20.00 %	Pulse	

Calculator

<b>Used Element Qty.</b>	<b>First Element</b>	<b>Last Element</b>	<b>Resolution</b>	<b>Wave Type</b>	<b>Material Velocity</b>
6	1	16	1.0	Shear	3240.0 m/s
<b>Start Angle</b>	<b>Stop Angle</b>	<b>Angle Resolution</b>	<b>Focal Depth</b>	<b>Law Configuration</b>	
31.5°	N/A	N/A	50.00 mm	Linear	

Group 2

Probe Characterization

<b>Probe Model</b>	<b>Probe Serial #</b>				
5L16-A1	5L16-A1				
<b>Probe Frequency</b>	<b>Peak Frequency</b>	<b>Wedge Model</b>	<b>Wedge Angle</b>	<b>Probe Aperture</b>	
5.00 MHz	N/A	ABWX739A	39.0°	3.60 mm	
	<b>Lower Frequency</b>	<b>Higher Frequency</b>	<b>Center Frequency</b>	<b>Bandwidth (MHz)</b>	<b>Bandwidth (%)</b>
-6 dB	N/A	N/A	N/A	N/A	N/A
-20 dB	N/A	N/A	N/A	N/A	N/A
<b>Date</b>	<b>Time</b>	<b>Procedure</b>	<b>Calibration Block</b>	<b>Characterization Gain</b>	<b>A%</b>
N/A	N/A	N/A	N/A	N/A	N/A

Setup

<b>A:31.5 Sk:270 L:001</b>					
<b>Beam Delay</b>	<b>Start (Half Path)</b>	<b>Range (Half Path)</b>	<b>Max. PRF</b>	<b>Type</b>	<b>Averaging Factor</b>
9.42 us	-3.06 mm	51.84 mm	272	PA	1
<b>Scale Type</b>	<b>Scale Factor</b>	<b>Video Filter</b>	<b>Pretrig.</b>	<b>Rectification</b>	<b>Band-Pass Filter</b>
Compression	10	Off	0.00 μs	FW	None (0.54 - 22 MHz)
<b>Voltage</b>	<b>Gain</b>	<b>Mode</b>	<b>Wave Type</b>	<b>Sound Velocity</b>	<b>Pulse Width</b>
40 (Low)	35.00 dB	PE (Pulse-Echo)	Shear	3240.0 m/s	100.00 ns
<b>Scan Offset</b>	<b>Index Offset</b>	<b>Skew</b>			
20.00 mm	15.00 mm	270.0°			
<b>Gate</b>	<b>Start</b>	<b>Width</b>	<b>Threshold</b>	<b>Synchro</b>	
I	108.27 mm	0.38 mm	20.00 %	Pulse	
A	11.09 mm	12.79 mm	40.00 %	Pulse	
B	116.80 mm	0.38 mm	30.00 %	Pulse	

Calculator

<b>Used Element Qty.</b>	<b>First Element</b>	<b>Last Element</b>	<b>Resolution</b>	<b>Wave Type</b>	<b>Material Velocity</b>
6	1	16	1.0	Shear	3240.0 m/s
<b>Start Angle</b>	<b>Stop Angle</b>	<b>Angle Resolution</b>	<b>Focal Depth</b>	<b>Law Configuration</b>	
31.5°	N/A	N/A	50.00 mm	Linear	

Part

<b>Material</b>	<b>Geometry</b>	<b>Thickness</b>
STEEL, MILD	Plate	16.00 mm

Scan Area

<b>Scan Start</b>	<b>Scan Length</b>	<b>Scan Resolution</b>	<b>Index Start</b>	<b>Index Length</b>	<b>Index Resolution</b>
0.00 mm	860.00 mm	1.00 mm	0.00 mm	0.00 mm	6.81 mm
<b>Synchro Encoder</b>	<b>Max. Scan Speed</b>				
	272.00 mm/s				
<b>Axis</b>	<b>Encoder</b>	<b>Encoder Type</b>	<b>Encoder Resolution</b>	<b>Polarity</b>	
Scan	1	Quadrature	12.00 step/mm	Normal	
Index	Off	Off	Off	Off	