



VESSEL INSPECTION SUMMARY

Report #: **d34K-173502-01**
 Inspect Date: 30-Oct-15
 Page: 1 of 10
 IRISNDT #: 173502

Client: CHEVRON District: Liard Field: Liard
 Facility: d-34-K Unit / Skid #: N/A LSD: D-34-K/94-O-05
 Jurisdiction #: A573595 Equip Tag #: H-500 Serial #: NWP-2631-01
 CRN #: P0417.213 Nat'l Bd #: N/A Year Built: 2010
 Manufacturer: NWP Equipment Description: LINEHEATER
 Status: In Service - Date Removed From Service: N/A Service: Sour
 MAWP Shell: Atmos @ 200 °F Height/Length: Unknown Code Stamp: Y N
 MAWP Tube: 4503 Psi @ 200 °F Size/Diameter.: Unkno Insulated: Y N
 MDMT: -20 °F RT: RT-1 Volume: Unknown PWHT: Y N
 Support Type: Saddle Manway: Y N
 C.A.: _____ Coated: Y N Clad: Y N J.E.: N/A (No Remote Access) - _____

Component	Material	Nominal Thk	Diameter	OD/ID	Tube Side	Shell Side
- Shell	UNKNOWN	in.	in.	OD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- Tubes	UNKNOWN	0.674 in.	4.500 in.	OD	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-					<input type="checkbox"/>	<input type="checkbox"/>
-					<input type="checkbox"/>	<input type="checkbox"/>
-					<input type="checkbox"/>	<input type="checkbox"/>

Comments:
 Vessel was dismantled during the inspection. Firetube was removed. Inlet & outlet piping were removed. Proper blinds were installed to ensure isolation from service.

PSV Static Data

PSV -1 Tag #: PSV-1004 Serial #: Unknown CRN: Unknown
 Model #: Unknown Capacity: Unknown Set Pressure: 12500 kPa
 Manufacturer: Unknown Service Company: Muskwa
 Inlet Size & Type: 2.00 in. - Flanged Last Service Date: 5/20/15
 Outlet Size & Type: 3.00 in. - Flanged Block Valve: --- - -
 Carseal Intact: Yes Code Stamp: Yes
 Shell Side / Tube Side: Shell Side Location of PSV: On inlet separator

PSV -2 Tag #: N/A Serial #: N/A CRN: N/A
 Model #: N/A Capacity: N/A Set Pressure: N/A
 Manufacturer: N/A Service Company: N/A
 Inlet Size & Type: - Last Service Date: N/A
 Outlet Size & Type: - Block Valve: - - -
 Carseal Intact: N/A Code Stamp: _____
 Shell Side / Tube Side: _____ Location of PSV: N/A

PSV Comments

PSV is located on inlet separator.
 Static data & service tag were not verified.



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 Page: 2 of 10
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External Inspection Results - VE External Inspection Performed

Item	Y	N	N/A	Condition	Comment	NCR	Action Item	Priority
Nameplate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Coil & firetube data plates	<input type="checkbox"/>	<input type="checkbox"/>	
Foundation and Supports	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Skid Level	<input type="checkbox"/>	<input type="checkbox"/>	
Anchor Bolts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Ground cable attached	<input type="checkbox"/>	<input type="checkbox"/>	
Insulation Condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No major cladding damage	<input type="checkbox"/>	<input type="checkbox"/>	
PSV	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Set pressure below MAWP coil	<input type="checkbox"/>	<input type="checkbox"/>	
Shell & Heads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No damage/deformation noted	<input type="checkbox"/>	<input type="checkbox"/>	
Metal Surfaces (Paint)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Painted, no issues observed	<input type="checkbox"/>	<input type="checkbox"/>	
Aux Equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Installed, no issues noted	<input type="checkbox"/>	<input type="checkbox"/>	
Cathodic Protection	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Alignment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Level, horizontal	<input type="checkbox"/>	<input type="checkbox"/>	
Flange Connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Flanges dismantled during insp.	<input type="checkbox"/>	<input type="checkbox"/>	
Pressure Gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Clear, secure	<input type="checkbox"/>	<input type="checkbox"/>	
Piping from Vessel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Some dismantled, no issues	<input type="checkbox"/>	<input type="checkbox"/>	
Temperature Gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Clear, secure	<input type="checkbox"/>	<input type="checkbox"/>	
Sight Glass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Expansion tank	<input type="checkbox"/>	<input type="checkbox"/>	
Leaks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		No leaks observed	<input type="checkbox"/>	<input type="checkbox"/>	
Current UT Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Coil piping, inlet/outlet, firetube	UT Company: IRISNDT		
Previous UT Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Not available for review	UT Company: Unknown		

LEGEND:

Priority 0 - General Recommendations
 Priority 1 - Goal date is 30 days from the activity date
 Priority 2 - Goal date is 90 days from the activity date.
 Priority 3 - Goal date is 1 Year from the activity date.
 Priority 4 - Goal date is 5 Years from the activity date.

External Visual Observations

Manual Review Required By Customer Representative - Yes

Vessel was dismantled for internal inspection.
 Firetube was removed.
 Piping was dismantled at inlet & outlet.
 UT survet of inlet/outlet elbows showed no issues.

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 Page: 3 of 10
 IRISNDT #: 173502

Client: CHEVRON LSD: D-34-K/94-O-05 Jurisdiction #: A573595

Internal Inspection Results – VI Internal Inspection Performed

Item	Y	N	N/A	Condition	Comment	NCR	Action Item	Priority
Shell	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No deformation, damage	<input type="checkbox"/>	<input type="checkbox"/>	
Heads	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Tubesheets only	<input type="checkbox"/>	<input type="checkbox"/>	
Manway	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Access through removed firetub	<input type="checkbox"/>	<input type="checkbox"/>	
Gasket Surfaces	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	Requires proper cleaning	<input type="checkbox"/>	<input type="checkbox"/>	
Welds	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No defects/damage observed	<input type="checkbox"/>	<input type="checkbox"/>	
Refractory	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Heating Coils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No visible damage	<input type="checkbox"/>	<input type="checkbox"/>	
Demister Pad	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Vane Pack	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Baffles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No damage observed	<input type="checkbox"/>	<input type="checkbox"/>	
Trays	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Internal Coating	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Not fitted	<input type="checkbox"/>	<input type="checkbox"/>	
Tubesheet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	No issues observed	<input type="checkbox"/>	<input type="checkbox"/>	
Tube Bundle	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accept	See heating coils	<input type="checkbox"/>	<input type="checkbox"/>	

LEGEND:

- Priority 0 - General Recommendations.
- Priority 1 - Goal date is 30 days from the activity date.
- Priority 2 - Goal date is 90 days from the activity date.
- Priority 3 - Goal date is 1 Year from the activity date.
- Priority 4 - Goal date is 5 Years from the activity date.

Internal Visual Observations

Manual Review Required By Customer Representative - Yes

The line heater fire tube was removed for an internal inspection.

Vessel was drained and washed.

Firetube showed typical discoloration at burner side for first few feet. Some scale build up. Fire tube to tubesheet welds & mitered return bend welds were MPI tested for cracking. No relevant indications were observed. A UT CML survey was conducted on the firetube. No issues were observed.

Coil tube bundle was inspected from the open firetube side of vessel. Entry to the vessel was not permitted. No damage, deformation or suspicious deposits were identified. Tube baffle plate appeared in good condition. A UT CML survey was performed on coil return bends accessible from open end. Some general wall loss not below minimum thickness was identified on individual return bend elbows. See UT CML spreadsheet for specific locations.

No issues were observed internally on the thermocouples, nozzles, shell or internal welds. Only internal surfaces accessible from standing at the open end were inspected.

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 Page: 4 of 10
 IRISNDT #: 173502

Client: CHEVRON LSD: D-34-K/94-O-05 Jurisdiction #: A573595

Attached to Vessel Inspection Report # N/A

Additional Attachments # of pages N/A Specify N/A
 NDE
 Performed: UT MT PT ET RT OTHER
 NDE Report #: Associated UT CML Spreadsheets & Attached MT Report - 'Chevron_H-500_A573595_173502_CA0312-MT-2'
 Items Raised: NCR No Operational Action Item No Repair Action Item No Deferred Action Item No

Action Items / Recommendations:

Continue to monitor general wall loss in coil return bund 180 deg elbows.
 Maintain inspection intervals to ensure safe operation.

Actions Corrected at Time of Inspection: (If actions were corrected at the time of Inspection – note the corrected actions here.)

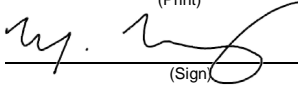
No corrective actions were taken at time of inspection.

Meets Code Criteria: - Yes

Re-Inspection Required - No

Recommended Inspection Intervals:

VE Inspect.	Last Inspection:	Oct - 2015	Interval (yrs)	03	Next Inspection:	Oct - 2018
VI Inspect.	Last Inspection:	Oct - 2015	Interval (yrs)	03	Next Inspection:	Oct - 2018
UT Inspect.	Last Inspection:	Oct - 2015	Interval (yrs)	01	Next Inspection:	Oct - 2016
PSV Service	Last Inspection:	---	Interval (yrs)		Next Inspection:	--- - 0000

Unit #: <u>560</u> Kilometers: <u>N/A</u>	Consumables	Inspector
In: <u>00:00</u> Out: <u>00:00</u> Hrs: _____	Min. _____	<u>Matthew Mackay</u> ISPVI: <u>748</u>
In: <u>00:00</u> Out: <u>00:00</u> Hrs: _____	_____	(Print) <u>Oct 31/15</u>
Personnel <u>Matthew Mackay De-ann Perrey</u>	_____	(Sign)  API510: <u>52235</u>
P.O.# / W.O.#/AFE #: <u>---</u> <u>N/A</u>	_____	Client Representative
		I am in full agreement with report contents: } (Print) _____
		(Sign) _____

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Equipment Photographs:



01 - H-500 LINEHEATER DATA PLATE



02 - H-500 LINEHEATER DATA PLATE



03 - H-500 LINEHEATER OVERVIEW



04 - H-500 LINEHEATER INLET & OUTLET DISMANTLED



05 - H-500 LINEHEATER SKID 7 PILINGS



06 - H-500 LINEHEATER SKID 7 GROUND CABLE



07 - H-500 LINEHEATER BURNER



08 - H-500 LINEHEATER FIRETUBE OVERVIEW



09 - H-500 LINEHEATER FIRETUBE OVERVIEW



10 - H-500 LINEHEATER FIRETUBE BURNER SIDE



11 - H-500 LINEHEATER FIRETUBE BURNER SIDE DISCOLORATION



12 - H-500 LINEHEATER FIRETUBE BURNER SIDE DISCOLORATION



13 - H-500 LINEHEATER OPEN SHELL



14 - H-500 LINEHEATER SHELL BOTTOM



15 - H-500 LINEHEATER EXPANSION TANK & LEVEL GAUGE



16 - H-500 LINEHEATER COIL



17 - H-500 LINEHEATER PROBES



18 - H-500 LINEHEATER PRE-HEAT LINE



19 - H-500 LINEHEATER PSV OVERVIEW

MT Report:

IRISNDT		MAGNETIC PARTICLE INSPECTION REPORT	CA0312-MT-2 Page 1 of 1
Procedure: 5.0 Rev 1 Technique: MT-2V Code: ASME Sect VIII Div. 1 - App 6-4 Other: Crack check	Client: Chevron IRISNDT #: 173502 Location: d-34-K/94-O-05 Liard Item Inspected: Lineheater Firetube	Date: 31-Oct-15 Other: H-500 Other: A573595	
Surface Condition: Painted <input type="checkbox"/> Sandblasted <input type="checkbox"/> Machined <input type="checkbox"/> As Cast <input type="checkbox"/> As Forged <input type="checkbox"/> Weldment <input checked="" type="checkbox"/> Other <input type="checkbox"/>			
Material: Carbon Steel Thickness: .250" approx Heat Treatment: N/A			
Magnetizing Equipment: Yoke <input checked="" type="checkbox"/> Coil <input type="checkbox"/> Permanent <input type="checkbox"/> IRISNDT #: 40155 Mfg: Parker Calibration Date: 6-Oct-15			
Method of Magnetization: AC <input checked="" type="checkbox"/> DC <input type="checkbox"/> Continuous <input checked="" type="checkbox"/>			
Blacklight: Y <input type="checkbox"/> N/A <input checked="" type="checkbox"/> IRISNDT #: N/A Verification per ASME V Art 7 T.777.2 Blacklight Meter: IRISNDT #: N/A Calibration Date: - -			
Whitelight: Y <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Lighting Equipment: Yoke Light (10W)			
Magnetic Particles: Dry <input type="checkbox"/> Wet <input checked="" type="checkbox"/> Red <input type="checkbox"/> Grey <input type="checkbox"/> Black <input checked="" type="checkbox"/> Fluorescent <input type="checkbox"/> Batch #: 1168-12 Mfg: Magnaflux Type: 7C			
Background: <input checked="" type="checkbox"/> Batch #: 1326 Mfg: Ardrex Type: 8901W			
Scope: Wet black magnetic particle inspection was performed on Lineheater H-500 Firetube at d-34-K/94-O-05 facility. The following was inspected during an internal inspection opportunity: <ul style="list-style-type: none"> - All tube to tubesheet fillet welds - All mitered return bend welds 			
Results: <ul style="list-style-type: none"> - No relevant indications were observed - Acceptable to above listed code 			
Inspection Limitation(s): ---			
Unit#: 560 Kilometers: --- In: --- Out: --- Hrs: --- In: --- Out: --- Hrs: --- Personnel: MM DP	Consumables: MT-Min.	Interpretation by: Matthew Mackay SNT-TC-1A: II (Print) C.G.S.B.: II Oct 31/15 (Level) C.G.S.B. #: 12580 (Signature) Client Representative: (Print) I am in full agreement with report contents (Sign)	
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