

Equip. No. V-701 Prov. Reg. No. Ⓐ 462576 C.R.N. P-6520.2 Serial No. 11796 Yr. Inst. _____
 Code/Div. ASME VIII, DIV1 Size: 48in OD x 12ft Manufacturer: E&D PIPE AND PROCESS EQUIPMENT Yr. Blt. 2001
 C. Stamp: U Service: SWEET PWHT: NIL Radiography: RT-1 Insulated: YES

Design & Materials Data

HEAD:
 Top Mat'l. SA 516 70N Top Nom. 7.9mm Top C.A. 1.6mm
 Btm. Mat'l. _____ Btm. Nom. _____ Btm. C.A. _____
 CHANNEL:
 Material: _____ Nominal: _____ C.A. _____
 BOOT
 Head Mat'l. _____ Head Nom. _____ Head C.A. _____
 Shell Mat'l. _____ Shell Nom. _____ Shell C.A. _____
 SHELL
 Material: SA 516 70N Nominal: 9.5mm C.A. 1.6mm
 MAWP Shell Side: 345 kPa @ Temp. 149°C
 MAWP Tube Side: _____ @ Temp. _____

CLIENT	CANADIAN NATURAL RESOURCES		
FACILITY	SOUTH SPIRIT RIVER BATTERY UNIT #1 LSD 08/09-09-77-07 W6M		
ITEM	FLARE KNOCKOUT DRUM		
BY: TR	DATE: 06/2007	DWG.# 2	

UTS DATA

CLIENT: CANADIAN NATURAL RESOURCES
EQUIPMENT: FLARE KNOCKOUT DRUM
CRN#: P-6520.2
PROV REG: A 462576
TESTED ON STREAM

FACILITY: SOUTH SPIRIT RIVER BATTERY
SERVICE: SWEET
LOCATION: 08/09-09-77-07 W6M
RTD JOB #: 05.000419
REFER TO DRAWING: 2

Test Point	THICKNESS DATA				Flag	Crit	C.A.	Nom.	Short Term	Long Term	Ave. mm/py	Flag Date
905												
Description:	LOWER HEAD											
	2007 6											
Min. Thick.	9.2	6.3	1.6	7.9								L
Average:	9.4				0	0						L
Analysis:												
910												
Description:	BOTTOM SHELL											
	2007 6											
Min. Thick.	10	7.9	1.6	9.5								L
Average:	10.2				0	0						L
Analysis:												
915												
Description:	BOTTOM SHELL											
	2007 6											
Min. Thick.	10	7.9	1.6	9.5								L
Average:	10.2				0	0						L
Analysis:												
920												
Description:	LOWER HEAD											
	2007 6											
Min. Thick.	9	6.3	1.6	7.9								L
Average:	9.5				0	0						L
Analysis:	2007/06 MIN SCAN AT KNUCKLE.											
925												
Description:	MID SHELL											
	2007 6											
Min. Thick.	10	7.9	1.6	9.5								L
Average:	10.3				0	0						L
Analysis:												

HORIZONTAL VESSEL - GENERAL INSPECTION FORM						
District: Grande Prairie, A.B.			Skid No.			
Facility: South Spirit River Battery Unit # 1			Location (LSD): 09-09-77-07 W6M			
Vessel Name & Equipment Number: Flare Knock Out Drum						
Orientation: Horizontal						
Status: In Service			Regulatory Inspection			
PRESSURE VESSEL NAMEPLATE DATA						
"A" or "G" or "S" (Sask.) or BC Registration Number. A 462576			CRN Number P 6520.2			
Vessel serial number: 11796			Size: 48 in x 12 ft			
Shell thickness: 9.5 mm			Shell material: SA-516-70N			
Head thickness: 7.9 mm			Head material: SA-516-70N			
Tube wall thickness:			Tube material:			
Tube diameter:			Tube length:			
Channel thickness:			Channel material:			
MAWP	Shell: 50 PSI		Operating pressure	Shell:		
	Tubes:			Tubes:		
Design Temp.	Shell: 300 Deg. F		Operating temperature	Shell:		
	Tubes:			Tubes:		
X-ray: RT-1			Heat treatment: Nil			
Code parameters: ASME VIII Div.1			Joint efficiency (if on nameplate):			
Manufacturer: E and D Pipe and Process Equipment			Year built: 2001			
Corrosion allowance: 1.6 mm			Manway: Yes			
PRESSURE SAFETY VALVE NAMEPLATE DATA						
Tag Number(s)	Set Pressure PSI	CRN #	Manufacturer /Model / Serial# and Code Stamp	Capacity (Scfm)	Size	Set Date
Shell Side No PSV on this system						
SERVICE CONDITIONS-INDICATE ALL THAT APPLY						
Sweet X	Sour		Oil X	Gas X	Water X	
Amine	LPG		Condensate X	Air	Glycol	
Other (Describe):						

Inspection Interval _____ PSV Service Interval _____

(Determined by MIC in conjunction with Chief Inspector following guidelines of CNRLs Canada Owner-User Inspection Program)
Reports reviewed and accepted by:

Mechanical Integrity Coordinator _____ Date _____

Fill out all forms as completely as possible. All information is important! Use back of sheets to record additional information or sketch if required.

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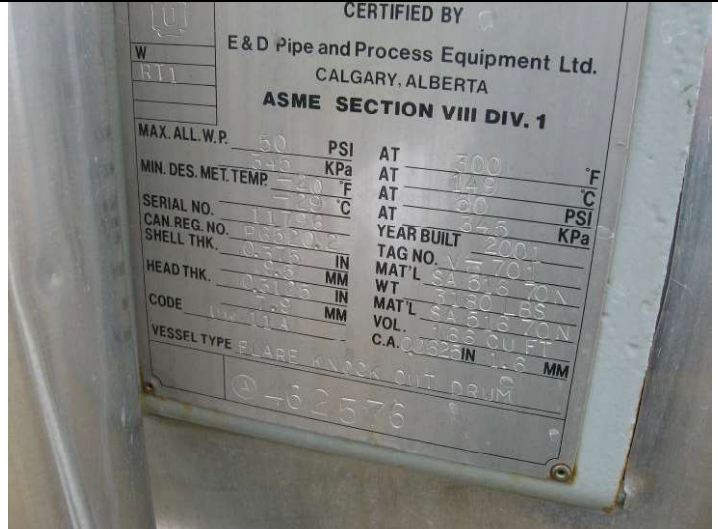
External Inspection Items	G	F	P	N/A	Comments
Insulation Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture. Are straps secured?	X				Vessel is fully insulated – no open or torn sections.
External Condition Assess paint condition, areas peeling, record any corrosion, damage, distortion etc (record location, size and depth of corrosion or damage)	X				Paint in good condition – no exposed metal, no external corrosion observed.
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaks observed.
Skirt: Assess condition of paint, fire protection, and concrete. Look for corrosion, buckling, dents, etc. Look at vessel surface area near supports. Verify no signs of leakage at attachment to vessel and attachment welds are acceptable. Is ground wire attached?	X				Saddle: No deflection or distortion - no signs of leaks. Ground wire firmly attached to saddle.
Anchor Bolts Hammer tap to ensure secure. Look for corrosion, cracking in threads or signs of deformation.	X				Firmly bolted to skid.
Concrete foundation Check for cracks, spalling, etc.				X	
Ladder / Platform Describe general condition, ensure support is secure to vessel, and describe any hazards.		X			No ladder
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted? Inspect gussets for cracking.	X				Stud threads are fully engaged to nuts – no short bolts. No damage or deflections observed – no leaks. Insulation covers all - nozzles are not gusseted.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				X	No gauges visible.
External Piping Ensure pipe is well supported. All clamps, supports, shoes, etc. in place. Look for evidence of structural overload, deflection, etc. Paint condition, external corrosion?	X				Inlet and Outlet piping is well supported, all clamps, supports, and shoes are in place. No structural overloads or deflections noted. Piping is insulated – no open or torn areas.
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				Truck pump out valve is properly supported.
PSV Ensure PSV is set at pressure at or below that of vessel. Discharge piping is same size as valve outlet and is properly supported and routed. Are psv seals in place? Ensure no block valves between psv and vessel, or if there is that they are locked/sealed open.				X	No PSV on this system – vents to atmosphere.
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic thickness survey carried out– no metal thickness detected below nominal minus corrosion allowance.
Other Observations:					

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Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				100 % internally coated – 1 small area of coating missing at 6:00 position o internal edge of man way nozzle – no corrosion.
Anodes. How many, type, condition. % consumed. Are they being replaced?				X	No anodes
Internal Piping Is there any? If so, carbon or stainless steel. Describe condition, dents, corrosion, erosion, etc. Ensure supports are secure and any bolts are suitable for future use.	X				Heat Medium coil x 2: Good condition – no scale, no corrosion.
Trays How many? Type of material. Are valves in place. Check for erosion/ corrosion; wear on tray valve legs. Cleanliness?				X	No trays.
Baffles, deflector plates, etc. If present, describe condition. Look closely at welds attached to vessel wall.	X				Inlet deflector x 2 - in place – no broken members – no exposed metal. Float intact. Vortex breaker attached.
East Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Fully coated – no exposed metal.
West Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Fully coated – no exposed metal.
Shell Sections Record number of shell sections. Record location, size and depth of all erosion, corrosion or mechanical damage. Describe general condition. If any corrosion greater than corrosion allowance is observed in either shell or head, discuss with Chief Inspector before closing vessel.		X			1 can section – fully coated – no exposed metal to shell sections. 1 small exposed area on man way access to shell area – no corrosion.
Demister pad Is it in place? Is it clean? If any corrosion is apparent in vessel, lift pad and check top head for corrosion.				X	No demister in this vessel.
Welds Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X				Good condition, viewed through coating - no previous corrosion or pitting.
Repairs Required. If yes, ensure procedure and copy of AB 40 is on file, and one sent to local ABSA, and Chief Inspector		X			1. Hand patch coating on man way access.
NDE Was any NDE done. (MI coordinator to review results)	X				No internal NDE carried out at this time – internal is coated with epoxy.
<p>Recommendations or corrective actions : Vessel is Fit for Service or describe corrective actions required) (MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented) Other Observations: Recommendations: 1. Hand patch coating at man way access. Summary: This vessel is in good overall condition, visual internal and external carried out – 1 small area of coating failure – no corrosion or pitting detected. Vessel is fit for service</p>					

Inspected By: Dellas Wiedman

Date: June 19 – 2007



Name Plate



Vessel Overview



Man way access



External piping and ground cable



Heat coil in opposite head



Specific gravity float, heat medium coil and vortex breaker.



Coating failure at man way access



Inlet Diffusers



View from internal surface of coating failure