CNRL Procedure 4: Installation of Nozzles (PWHT Vessel)

A#	0445902	Facility	District: Fort St. John South, Field: Milligan
CRN#	N-7770.21	LSD	B63G/94H2
S/N	99-1401-1		
MAWP	1438 psig	Vessel Description	24-inch Diameter Glycol Contactor Tower
Material	SA-516-70MT		
Shell Thickness	1.250"	Scope of Work: - Installation of nozzles in shell of ASME Section VIII Div 1 vessel - Nozzles to be installed in upper tray section between trays - Location of trays to be determined by radiographic inspection - All nozzles to be installed are 3", RFLWN, 600# SA-105N	
Head Thickness	Top: 1.191" Bottom: 1.214"		

BRIGHT

Scope

Anthony Mark Mar 24 '09

1. Installation of nozzles in an ASME Section VIII Division I pressure vessel (tower) constructed of P-I Group 1 or 2 materials.
2. Materials shall be of the same specification, grade, and dimensions as defined in the manufacturer's original registered design.

Procedure

Cut Out

1. For each nozzle to be installed, define the area to be cut out of the shell.
2. Perform UT of the cut areas to determine if any laminations or discontinuities exist.
3. If laminations or discontinuities are identified, move the cut out area to attempt to avoid these defects.
4. Owner's Inspector shall approve the layout of the area to be removed prior to the initial cut being made.
5. Ensure the vessel has been sanitized and there are no explosive environments present either in the general atmosphere within the vessel or in trapped sites behind internal attachments. If there is any question about the certainty of this step

consideration should be given to alternative cutting methods such as high-pressure water.

6. Perform the cut.

Procedure

continued...

Weld Preparation

7. The joint preparation shall be in accordance with the manufacture's original registered design.

8. Area to be welded to shall be cleaned to white metal for a distance of 10 mm beyond the expected weld area.

9. The weld area shall be MT examined for laminations and surface discontinuities. If laminations or surface discontinuities are identified they shall be brought to the attention of the Chief Inspector and dealt with in accordance with the requirement of the Company's Owner User Program.

Hydrogen Bake out and Sulfur removal (Required Only if Vessel Has Been Exposed to Sour Service):

10. Vessels that have been exposed to sour or sulfur bearing process streams shall required the weld attachment area to undergo a "Bake Out" procedure. This procedure shall consist of heating the weld attachment area and 10 cm on each side to 315 C (600 F) for and holding that temperature for a minimum of 60 minutes. Bake out should be done prior to cutting out, if cutout is done thermally. Stipulate controls methods.

11. *Bake Out* is performed by either induction coil (use thermocouples as control instrumentation) or propane torch (use temperature-sensitive crayons – upper and lower temperature to be controlled). Oxyacetylene torches are **not** acceptable.

12. If induction coils are used, a 250 C (482 F) four-hour heat treatment may be substituted for the normal 315 C (600 F) one-hour heat treatment.

Procedure **continued...**	**Preheat and Welding:**
	Post Weld Heat Treated Equipment: 13. Minimum pre-heat shall be 175 C (350 F) for a 100 mm band on both sides of the weld attachment area. 14. Maximum interpass temperature shall not exceed 230 C (450 F). 15. The Owner's Inspector shall witness seal on the box being broken and ensure that once the box has been opened the electrodes are stored in an oven. 16. Perform PWHT, either by oven or thermal truck, at 1150F for 60 minutes.
	Post Welding NDE: 17. MT 12 hours after completion of the work 18. Hydrotest as per ASME Section VIII Division I.
	Documentation: 19. Ensure Company Approved Contractor has completed QC documentation. 20. Sign off repair documentation and ensure one copy is submitted to regulatory body and one is retained on file in the equipment inspection file.

Procedure 4: Installation of Nozzles			
Section	**Comments**	**Sign Off**	**Date**
Scope		Anthony Merl	Mar 24/09
Procedure			
Cut Out			
Step 1			
Step 2			
Step 3			
Step 4			
Step 5			
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Weld Preparation			
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Hydrogen Bake Out and Sulphur Removal			
Step 10			
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Preheat and Welding			
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Post Welding NDE			
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