

FIRED HEATER INSPECTION REPORT

LSD 12-05-54-20W5

Date January 3, 2017

SAP Equipment ID

66068448

Report #20170103GGa

HEATER STATIC DATA						
Plant	Galloway	Op Unit	2018	System		
Prov. Insp. #	NB#	CRN	Equip Tag #			
Description	Alco	Serial #				
Manufacturer	Vessel Class					
Internal Access	YES	NO	Description	Year Built		
COIL #1 RADIANT DATA						
MAWP	kPa / psi	@	°C / °F	MDMT °C / °F		
CODE	Fluid Service	Sweet/Sour		PWHT	YES	NO
Diameter	Length (T/T)	mm/in	OAL	mm / in	Vertical	Horizontal
Coil	Mat'l	Thickness	mm / in		Corr Allowance	mm / in
Operating Pressure	kPa / psi	Operating Temperature		°C / °F		
COIL #2 CONVECTION DATA						
MAWP	kPa / psi	@	°C / °F	MDMT °C / °F		
CODE	Fluid Service	Sweet/Sour		PWHT	YES	NO
Diameter	Length (T/T)	mm/in	OAL	mm / in	Vertical	Horizontal
Coil	Mat'l	Thickness	mm / in		Corr Allowance	mm / in
Operating Pressure	kPa / psi	Operating Temperature		°C / °F		
PSV STATIC DATA						
Serial No.	Location	Set Pressure	Capacity SCFM / Lbs/Hr / GPM	Manufacturer	Model / Type	Service Date / Company
PSV DETAILS						
	Type (Thread/Flange)	ANSI Rating		Size (mm)		
PRD Inlet						
PRD Outlet						

INSPECTION SUMMARY

Fire tube failure December 30, 2016

There was a visible linear indication on the inside of the fire tube on the exhaust side at the fire tube to flange weld. Wet magnetic particle testing (WMPT) was completed on this linear indication and found that the it runs from 7:30 to 9:45 o clock (looking into the fire tube) that measured 5.5 inches long (See picture INSIDE INDICATION 5.5 INCHES LONG), there were no other indications found on the inside of the exhaust side at the fire tube to flange weld.

Wet magnetic particle testing (WMPT) was completed on the fire tube to flange fillet weld. WMPT show a linear indication that runs from 1 to 3:30 o clock (looking at the fire tube to flange fillet weld) that measured 7 inches long (see picture OUTSIDE INDICATION 7 INCH LONG), there were no other indications found on the fire tube to flange fillet weld. History: This weld was repair in the spring of 2016 during the 2016 Galloway T/A in the same location. At the time of the repair the linear indication was completed removed. It is my thought that when the repair was completed not all indications were found, leaving linear indications (cracks) that have propagated out causing this failure. Recommend that the firing rates of the heater be looked at to maybe help reduce vibrations and/or replacing the fire tube with a new that has bellows to absorb the stresses and vibrations caused by the burner.

Wet magnetic particle testing (WMPT) was completed on the rest of the fire tube and no indications were found.

Repair Inside Fire Tube:

The linear indication on the inside of the fire tube was ground out 3/8 of an inch for the length of indication (5.5 inches), dry magnetic particle testing (DMPT) was completed on the ground out linear indication. There was 2

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linear indications at either end of the ground out indication. Linear indications were then ground out 3/4 of an inch more on either side and DMPT was completed again and no indication were found throughout the entire ground out liner indication. Total length of linear indication was 6.5 inches.

Linear indication was filled using a butt weld. See picture INSIDE INDICATION BUTT WELD.

Repair Outside Fire Tube to Flange Fillet Weld:

The linear indication on the fire tube to flange fillet weld was ground out for the length of indication (7 inches). The indication started at the toe of the fillet weld on the fire tube side and moved to the center of the fillet weld towards the flange, this was found using dry magnetic particle testing (DMPT). DMPT was completed again completed again a new indication was found, the fillet weld was then completely ground out. DMPT was completed again completed again and 2 indications were found on either side of the ground out indication. These indications were ground out 1/2 inch and DMPT was completed again completed again and no indications were found. Total length of linear indication was 8 inches.

Linear indication was filled using a fillet weld. See picture OUTSIDE FILLET WELD 8 INCH LONG.

RECOMMENDATIONS

NONCONFORMANCES / INSPECTION DEFICIENCIES

INSPECTION PLANNING

Inspection Strategy	Availability	Inspection Interval
Inspection Date	Date of Last Inspect	Date of Next Inspect

REPORT CERTIFICATION

The signatures below certify that inspections/tests have been completed in accordance with the identified inspection strategy and that the specified equipment is considered fit for service until the date of next inspection.

Inspected by		Date
Company	PESL #	API #
Reviewed and Approved by		Date
	PESL #	API #
Criticality Assessment Rerun	Inspection Planning Rerun	
Assessed Next Inspection Date		

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PHOTOS



Inside Indication – 5.5 Inches Long



Outside Indication – 7 Inches Long



Inside Indication – Butt Weld



Outside Fillet Weld – 8 Inches Long