



AEGIS Inspection Services LLC Inspection Report

Unit ID:	Distillation	Event:	2016 shutdown
Equipment ID:	C-4201	Date of Inspection:	9/2/16
Equipment Name/ Service:	Rectifier Column	Inspected By:	Corey Enrietti
Equipment Type:	Tower	Client:	Ergon Biofuels

Tower Internal Inspection Report

HISTORY:

1. 2014: Trays 18-20 were noted to be significantly distorted and were reworked, the 3/4" couplings throughout tower were found not back welded due to not being properly beveled at time of installation.
2. 2016:

WORK SCOPE:

1. Open and clean for visual inspection.

SPECIAL PREPARATION (if any required):

1. No special preparations were made prior to inspection.

REPAIRS (if any required):

The following repairs were performed as a result of the findings from this internal inspection:

1. Trays 18-20 were replaced; the trays were found lying in the bottom head when the tower was opened.
2. Missing tray valves and tray hardware was replaced.

MODIFICATIONS (if any performed):

No modifications were made to the Rectifier Column during the August 2016 shut down.

FUTURE RECOMMENDATIONS (if any forecasted):

No forecast items were generated as a result of the findings from this internal inspection.

SUMMARY:

During the August 2016 Turnaround the Rectifier Column (C-4201) was temporarily removed from service, blinded, and cleaned for maintenance and inspection. All maintenance activities were executed by Ohmstede Industrial Services. An internal API 510 inspection was performed by Aegis Inspection Services at this time. A UTT thickness survey was conducted at spot areas throughout the shell ID by an Aegis level II technician. Three trays (trays 18-20) were replaced at this time. After all maintenance, repairs and inspection were completed the tower was returned to operations for continued service.



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SHELL :

The shell of the tower from top to bottom had isolated scattered pitting up to 0.010” in depth. Random areas of mechanical damage were found throughout the column with a maximum depth of 0.030 inch. The shell also showed slight distortions due to manufacture defects. All visible circumferential and longitudinal weld seams were full profile and in a comparable condition to the shell base metal with the exception of a few locations where the welds were found ground flush to the shell.

HEADS :

The top and bottom head had minor surface roughness less than 0.010” in depth. There was mechanical damage noted throughout both heads, this mechanical damage was from manufacturing process (welding, grinding, ect.) and with no measureable depth. No bulges or distortions were noted.

NOZZLES :

All visible nozzles in the upper and lower section were clear of debris with no visible corrosion or erosion present. All nozzle back welds were ground smooth to the base metal. The 3/4” threaded couplings throughout the tower were not back welded due to not being correctly beveled at time of installation. No evidence of preferential corrosion or damage was visible at the nozzle back welds. The top and bottom manway gasket seating surfaces were free of mechanical or service induced damage at time of inspection.

TRAYS/ TRAY SUPPORTS :

The tray rings were seal welded on the top and bottom with no issues noted to the welds. The tray rings were found to be full thickness with no signs of damage or corrosion. The tray decks were secured and near full thickness. Trays 18-20 were replaced at this time due to being damaged during operation.

INTERNAL COMPONENTS/ PIPING :

Not applicable to this piece of equipment.

NDE:

Ultrasonic Thickness Testing	<input checked="" type="checkbox"/>	UTSW/ UTPA	<input type="checkbox"/>
Magnetic Particle Testing	<input type="checkbox"/>	Eddy Current/ IRIS/ Tube Testing	<input type="checkbox"/>
Dye Penetrant Testing	<input type="checkbox"/>	Advanced NDE/ Other (Describe Below)	<input type="checkbox"/>

A UTT survey was conducted on the shell of this vessel only no thickness readings were taken on nozzles per Ergon Biofuels Engineering. No significant wall loss was noted.



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MISCELLANEOUS :

No miscellaneous items at this time.

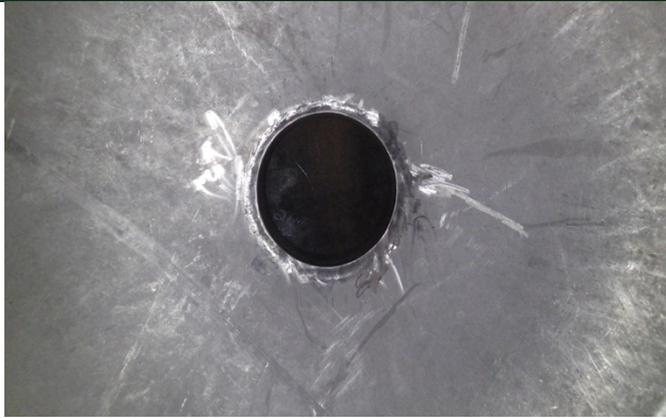
INSPECTOR (S)	API 510 CERT. NO.	DATE
Corey Enrietti	64344	9/2/16



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REFERENCE PHOTOGRAPHS



OVHD Nozzle



Mechanical Damage



Typical Tray



$\frac{3}{4}$ " not back welded



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Typical Weld Seam



Bottom Head and Nozzle