TechCorr

CASE STUDY

Long Range Ultrasonic Technique Inspection on Heater Radiant Tubes

TECHNICAL DETAILS

Client	:	XXXXX Refinery	
Location	:	India	
Heater Details	:	*Atmospheric Furnace*	*Vacuum Furnace*
		OD: 6”	OD: 4.5”, 6.62”, 8.62”
		Thickness: 0.28”	Thickness: 0.237”, 0.28” and 0.332”
		No. of Passes: 4	No. of Passes: 4
		No. of tubes: 22	No. of tubes: 20
		Tube metallurgy: SA335 P5	Tube metallurgy: SA335 P9
		Length of each tube: 19.1 M	Length of each tube: 16.3M
		Tube alignment: Vertical	Tube alignment: Horizontal
Inspection Date	:	June 2010	

SCOPE OF WORK

Long Range Ultrasonic Technique (LRUT) Inspection of Atmospheric and Vacuum Radiant Heater Tubes was carried out at one of the Refineries in India as per given technical specifications of the tubes.

Inspection of all the above tubes was completed in 8 days, working round the clock. LRUT was chosen technique by client as it covered 100% area of the tubes and client was expecting general wall thinning types of defects in the tubes which were easily detected by the technique. Other advantages of the latest generation of systems – namely the TeleTest Focus which is the most powerful tool in the market, allows to physically focus the sound beam at 8 different circumferential positions at any axial position along the length of the line. This means that one can get some good additional information from the interaction of the targeted sound beam with the area of concern allowing the operator to eliminate false calls and give the interpreter much more confidence by increasing the signal to noise ration.

LRUT was used first time in India for Inspection of Heater Tubes and TechCorr was able to successfully complete the project within time limit. Spacing between the two tubes and furnace wall was the major obstruction during the course of inspection. TeleTest collars could easily go through the spacing's available with minor adjustments.

Scope of work cont……..

Some of the areas which were not covered by LRUT were inspected by manual UT scanning so as to get the complete coverage of the tubes.

General Heater tube arrangement and tool setup photographs are given for better understanding of the application. Selective drawings showing general arrangement on one section shows the scan plan selected to cover the entire heater tubes.

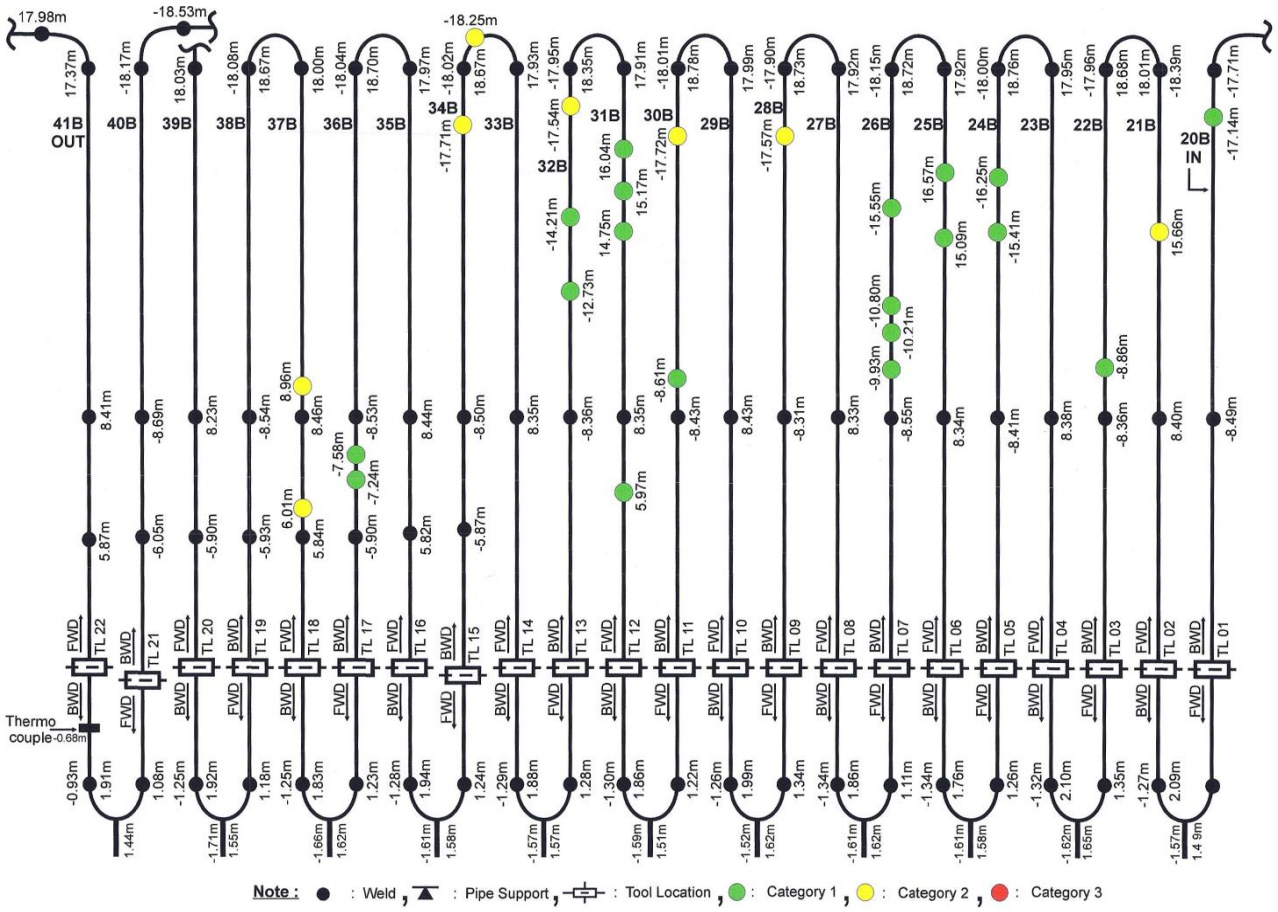
Based on above success of above Inspection activity, several other Refineries have approached TechCorr to carry out inspection of Heater Tubes.

Some of the Advantages of LRUT over other techniques are….

- *100 % Coverage of Heater Tubes.*
- *Minimal surface preparation required.*
- *Fast Inspection.*
- *Coverage of bend areas along with straight Sections.*
- *Allows to physically focus the sound beam at 8 different circumferential positions.*

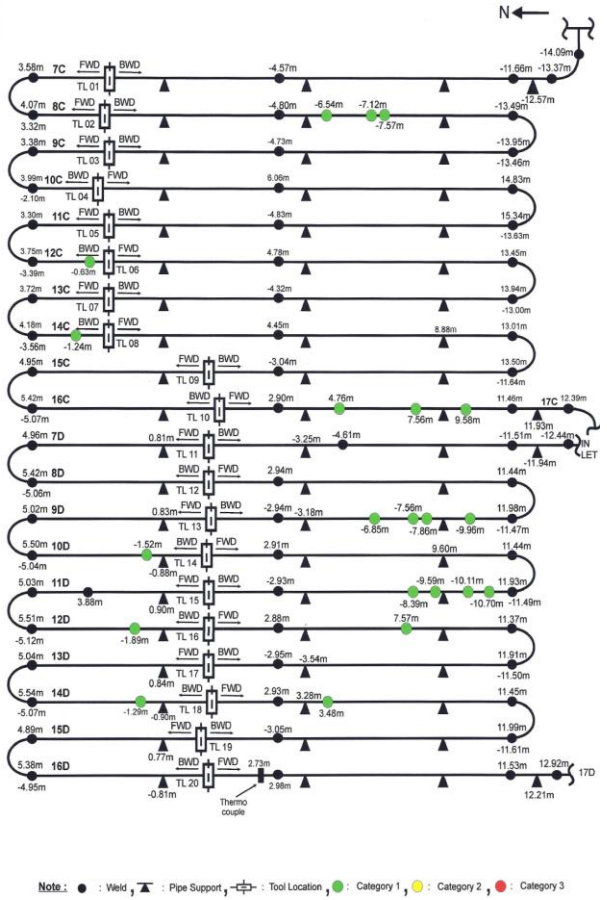
View showing Vertical Heater Tubes arrangement.

View showing collar placement on one of the Heater Tube.

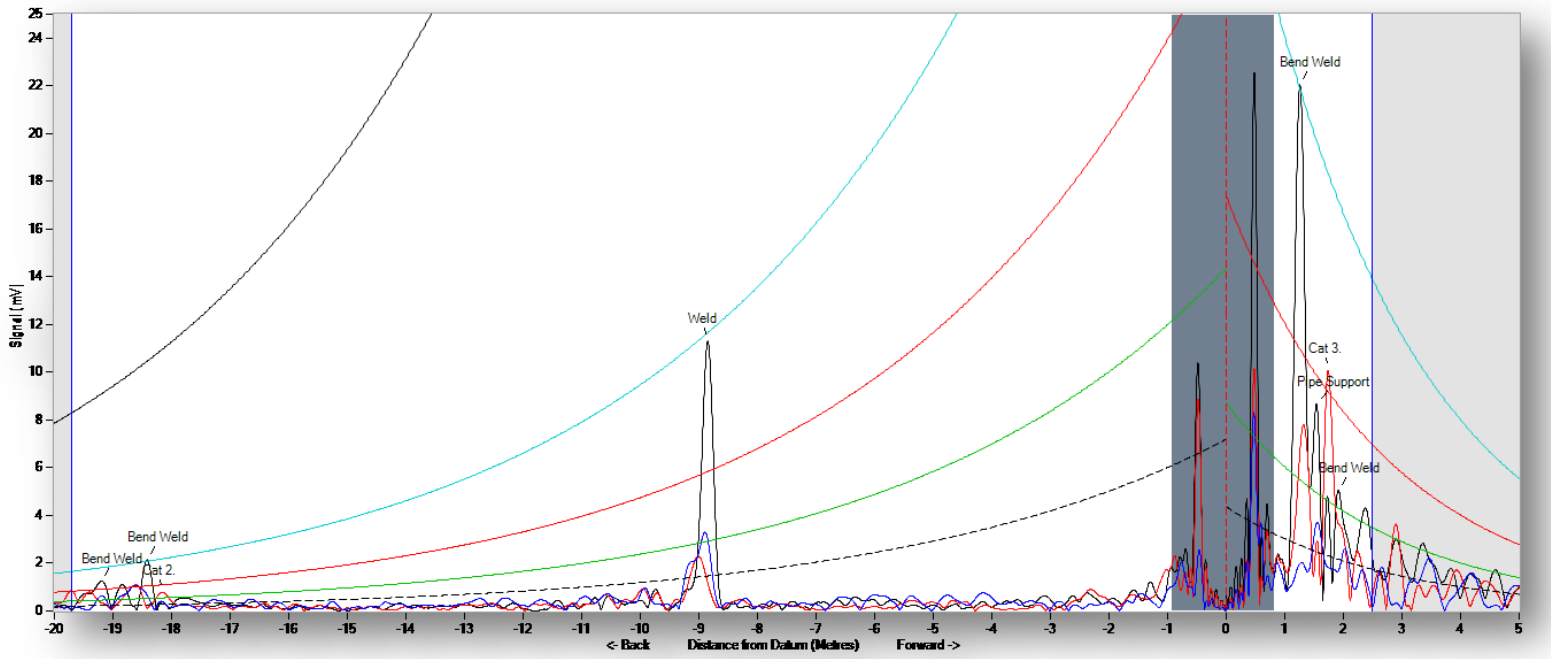


Typical view of Vertical Radiant Heater Section

Vacuum Section horizontal tubes



Typical view of Horizontal Radiant Vacuum heater section



LRUT Wave form showing Cat. 2 and 3 indications