URED PROJEC



Petrochemical **Industries Design Equipment & Parts** Manufactring Co.



Project Summary

Duration: 10 Months

Client: Tehran Raymand Co.

Owner: N.I.O.C

Equipment Type:

Quantity:

Weight:

Work Scope: Mechanical design, fabrication

Mechanical Design & Fabrication of Sulfur Recovery Unit Sulfur Condensers & Reactors

Project Tchnical information:

Item	Sulfur condenser (E-600- 102/202)	Reactor (R-600-101/201)	Reactor (R-600-002)					
Construction Material	Carbon Steel (Nace)	Carbon Steel (Nace)	Carbon Steel (Nace)					
Design Code	ASME SEC.VIII Div.1	ASME SEC.VIII Div.1	ASME SEC.VIII Div.1					
Material Code	ASME	ASME	ASME					
Service	Integrated Sulfur Condenser	1th & 2ed stage Reactor	Hydrogenation Reactor					
Design Pressure	7 barg	3.5 barg	3.5 barg					
Design Temperature	350 C	350 C	300 C					
Medium Process Gas		Process Gas	Process Gas					
ID * TL to TL (mm)	1900 X 3700	2450 X 5600	2500 X 6000					

Overview:

Pidemco was awarded the 3 reactors and 2 sulfur condensers of Sulfur Recover Unit of area 200 NGL3200 plant. Our client was Tehran Raymand Co. as EP contractor of the project. the whole tonnage of the equipments was about 110 tons and it was delivered within project schedule. Our work scope was mechanical design, fabrication and gurantee of these equipment.

Project control

Our project control team prepared time schedule, VPIS and WBS documents and planned and monitored project tasks using MS Project software. we informed our client of project progress by biweekly reports.

Procurment

Project raw materials should have complied to Nace MR 0175 and client's restrict requirements. The plates were supplied from german, tubes and forge material form south korean, Piping material from japanese and fittings from western europ sources. The commercial department of Pidemco were involved in sourcing, procurment, shippment and clearance of raw materials, dished heads were outsourced to Irainian head manufacturers.

Engineering

Mechanical design was according to ASME SEC. VIII DIV.1 standard. TEMA standard were considered in design and fabrication of sulfur condenseres. Wind and Siesmic calculations were done based on UBC.

Month										
1	2	3	4	5	6	7	8	9	10	

Engineering Supply of Raw Material Fabrication HYD. Test & Final Inspection

Project Features:

Part Details of Reactors

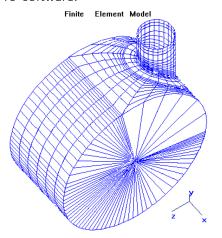
design of Sulfur condeners Tubesheet

Manufacturing equipment for Sour service according to NACE MR 0175

Refractory Lining of Reactors

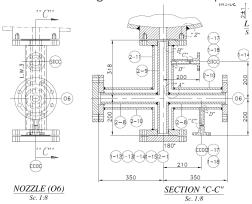
Sulfur condenser drain connections

PVElite software was used for code calculations. To calculate the local stresses on nozzle neck WRC 107 were considered and for nozzles out scope of this bulltin, FEA claculations were done based on ASME SEC VIII DIV.2 part 5 linear method using NozzlePro software.

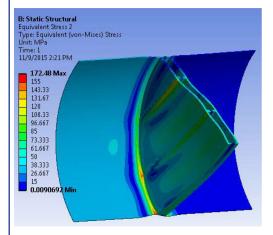


Mechanical design of sulfur condenser Tubesheets are a very critical issue as they undergo great thermal stresses during operation upset conditions.

Special drain conections were devised to facilitate cleaning of sulfur choke up.



Reactors Internal supports, seperation plates and lugs and details were specified and their integrity were checked by design by analysis method of ASME SEC. VIII DIV2 Part 5.



Fabrication

Tubes were Light expanded after welding away from tube to tubesheet welds. Since tubes were thick in sulfur condensers low tube expansion ratio were considered as it may brought tubesheet to undergo plastic deformation and loss of ductility around tubes. Low sulfur electrodes were implemented and hardness of weld metal and HAZ was ensured not to be over 200 HB. Welding were done in a way that ensured least welding heat input. Tubesheet untubed area lined with refractory in order to reduce the thermal shock in abnormal conditions during operation. Refractory application is vital to equipment lifetime. refractory anchor size and positioning was designed accurately so to prevent themfrom cracking the refractory. . Refractory lining thickness 75mm is considered to prevent elemental sulfur contacting metall surface in reactors. The whole equipment were put in furnace and PWHT were conducted to eleminate any residule stresses left during welding and forming operations



Quality Control

Various procedures were prepared and imposed fro conducting manufacturing activities.100% RT were conidered to ensure no defect welds. Tube to tubesheet welds, Nozzle to shall welds were checked with UT. After PWHT all welds were NDT tested befor hydrotest once more.

Find about Pidemco at: www.pidemco.com Contact Pidemco: info@pidemco.com +98 21 468 30200~209 No.33, Sanat Yekom St., Enghelab Blvd., Shahr-e-Ghods, 20th km Tehran-Karaj Old Road, Tehran, Iran

