



Vendor: 	Project: ESFAHAN OIL REFINERY UPGRADING & PETROCHEMICAL		Employer/Contractor: 
	Document Title: Technical Proposal for R2R FLUE GAS TREATMENT PACKAGE - RESIDUE FLUIDIZED CATALYTIC CRACKING UNIT		
	Document No.: HRCO-02-TP-455		
	Date: 23-Jan.- 2024	Rev.: 01	

5-4- Flue Gas Scrubber Section

A wet scrubber will be used to remove particulate and SOx from the total flue gas produced by the R2R FCC unit. The particulate content at Scrubber outlet will not exceed 50 mg/Nm3 on dry basis at 3% O2 excess.

The SOx content at Scrubber outlet will not exceed 800 vol ppm on dry basis at 3% O2 excess. Caustic Soda 53% w/w solution will be used as scrubbing agent in the scrubber tower.

5-5- Flue Gas Stack

Flue gas wet stack used to release flue gas at safe location in accordance with environmental regulation. Following cases will be considered in the stack sizing:

- 110% of normal operating case
- 45% of normal operating case
- Scrubber shutdown case
- CO incinerator bypass case
- Flue gas cooler bypass case
- Third stage separator bypass case

All required provisions for suitable installation and working of CEMS (Continuous Emission Monitoring System) such as nozzles (including spares), ladder and platform and any suitable internal and external support will be considered for the stack. Pollutant emissions of the gas outlet from the stack will be according to section 4-3 of this proposal.





6- UTILITY & CHEMICAL CONSUMPTION

Maximum required utilities and chemicals at design condition of the R2R Flue gas treatment package are described in table 6.

Table 6- Utility consumption at design condition

No.	Utility	Unit	Consumption	Spec
1	Fuel Oil (Clarified Oil)	kg/hr	6500	Supply Press.: acc. To project spec. Supply Temp.: acc. To project spec.
2	Instrument Air	Nm3/hr.	125	Supply Press.: 6.2 barg Supply Temp.: 40 °C
3	Electrical Power	kW	290	3ph, 50 Hz, 400 V

UPS and Non-UPS power consumption for UCP and at field shall be added to this table
Meeting conclusion: Bidder confirmed to modify consumption list for next revision

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No.	Utility	Unit	Consumption	Specification
4	Electrical Power	kW	1750	3ph, 50 Hz, 6000 V
5	HBW	Kg/hr	295,000	Supply Press.: 57.6 barg Supply Temp.: 148 °C
6	Saturated Steam	Kg/hr	195,000	Supply Press.: 47 barg Supply Temp.: 264 °C
7	Process Water	Kg/hr	160,000	Supply Press.: 3.4 barg Supply Temp.: 40 °C
8	High Pressure Steam	Kg/hr	Hold	Supply Press.: 42 barg Supply Temp.: 360 °C
9	Caustic Soda (53% w/w)	Kg/hr	7000	Supply Press.: 3 barg Supply Temp.: Amb.
10	Urea (10% w/w)	Kg/hr	400	Supply Press.: 3 barg Supply Temp.: Amb.
11	Sodium Phosphate (5% w/w)	Kg/hr	30	Supply Press.: 55 barg Supply Temp.: Amb.

Note 2: All the consumptions are preliminary and will be finalized at detail engineering.

7- SCOPE OF SUPPLY

R2R Flue gas treatment package will be supplied according to following main characteristics for equipment and relevant instruments, valves, pipe, fitting, structure, etc.

Detailed table for scope of supply according to MR is attached.

7-1- EQUIPMENT

Preliminary equipment list for the R2R Flue gas treatment package is attached.