	PROJECT		Standby SRU & Additional Tanks IOCL Paradip Refinery		
	CLIENT		INDIAN OIL CORPORATION LIMITED		
JOB SPECIFICATION FOR DEGREASING OF CARBON STEEL PIPING & VESSELS IN AMINE SERVICE	Project No. 080557C001	Document No. 080557C-000-JSC-0093-004			Rev. No. 0 Page 1 of 6

JOB SPECIFICATION FOR DEGREASING OF CARBON STEEL PIPING & VESSELS IN AMINE SERVICE

0	04/12/2019	ISSUED FOR IMPLEMENTATION	KMK	TNVS	TNVS	JMC
REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED	AUTHORIZED

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1. Introduction:

INDIAN OIL CORPORATION LIMITED (IOCL) has awarded Fax of Acceptance (FOA) dated 29th August 2019 to M/s. Technip India Limited (TPIL) for Consultancy services (PMC/EPCM services) for overall project management, FEED Review / FEED, Detailed Engineering, Procurement & expediting services, Tendering & award, Construction Management & Supervision, Assistance in start-up, Commissioning & performance test runs for installation of a Standby SRU of 525 TPD capacity and execution of Additional tanks for Paradip Refinery, Odisha, India.

2. Definitions & Abbreviations

Abbreviation	Definition /Expanded form
IOCL/ CLIENT	Indian Oil Corporation Limited
PMC/ CONSULTANT	Technip India Limited
LICENSOR	Party selected by IOCL for process technology ownership for any UNIT
CONTRACTOR	Party whose services are obtained for performing the works specified as part of LSTK / packages.
EPCM	Engineering, Procurement & Construction Management Services.
LSTK	Lump Sum Turn Key portion of the work to be executed by CONTRACTOR
FEED	Front End Engineering Design
AUTHORISED REPRESENTATIVE	IOCL's/ CONSULTANT's representative authorized to act for and on behalf of them.
VENDOR	Any third party supplying the equipment/materials for setting up the Plant
PROJECT	Indicates Standby SRU and Additional tanks Project, Paradip Refinery
UNIT	Indicates any particular portion of the project to be built which can be Process related or Utilities/Offsites related
SRU	Sulphur Recovery Unit

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3. Intent



- 3.1 This specification governs the requirement of degreasing for Carbon Steel and Stainless Steel piping and vessels in amine service, as indicated in relevant P & IDs. The degreasing of carbon steel piping shall be done by circulation method with 1-2% Sodium Bi-Carbonate (Soda Ash) solution and 200 ppm of non-foaming type non-ionic surfactant at 60-80°C temperature till oil and grease level in circulating degreasing liquid become constant.

4. Scope of Work

- 4.1 Scope of work by Contractor shall consist of carrying out degreasing of piping and vessels as indicated in LSTK contractor's P & IDs. Work shall include supply of all chemicals, temporary facilities- Tanks, pumps, Motors, starter assembly, analytical equipment, auxiliaries, boilers, heating coils, thermometers, valves, pressure gauges, safety gears etc required for satisfactory completion of work. The chemical cleaning contractor shall make a preliminary assessment of the site conditions and its existing facilities especially availability of steam, circulating pumps, Temporary tanks etc to make a final assessment of the temporary facilities, auxiliaries and spares that must be arranged by him for deployment at site. Required numbers of operating and supervisory staff for the degreasing operation need to be deployed by the contractor to ensure continuous availability of manpower during the entire operation. HSE policy and practices of the owner shall be followed and adhered.

4.2 General Conditions for Degreasing of amine Treating System

- Scope marked P&IDs shall be prepared by the LSTK contractor and shall be reviewed by Owner/ PMC.
- Chemical cleaning contractor shall submit a detailed procedure, in line with the procedure given above for the Degreasing operation and get approval from client.
- Control valve and turbine meter shall be replaced with spool assemblies.
- Flow Orifice plate shall not be in place.
- Instrument provided with isolation valves shall be protected from the chemical cleaning solution by closing the valve closest to the process line or equipment. Instrument drain valve, if provided shall be open. Relief valve, internal displacement type level instruments, thermowells, and other instruments not provided with isolation valves shall be removed and connections shall be removed and their connections shall be blinded off.
- Piping strainer screens shall be removed
- Process reciprocating and rotating equipment ancillary system shall be disconnected and blinded off and jumper lines or spools installed to complete piping circuits.
- Heating is to be external to the system being cleaned, using equipment furnished by the chemical cleaning contractor. Steam shall not be introduced into any part of the permanent system being cleaned.
- Transfer and circulating pumps for handling chemical cleaning solution shall be furnished by chemical cleaning contractor and shall operate from a dependable power source. The

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chemical cleaning solution shall not be stagnant in any part of the system being cleaned at any time

- Demister mesh of recycle gas KOD, first stage suction drum and second stage suction drum must be removed before the chemical cleaning.
- Blind flanges, spool pieces required for the mill scale removal operation shall be in chemical cleaning contractor's scope.
- Chemical cleaning contractor shall have all the tools and tackles required for this job.
- Laboratory Analytic equipment and pipette, burette etc and chemicals required for analysis purpose shall be supplied by the chemical cleaning contractor.
- Required and appropriate PPEs shall be provided by the Contractor to all working personnel.

4.3 Disposal of Chemicals



Chemical cleaning contractor is responsible to physically transfer the used chemical effluents after neutralization to Effluent Treatment Plant (ETP) inside the refinery via tankers. The effluent shall not be discharged into any sewers inside the plant. All required HSE norms of Owner shall be followed.

4.4 Report Preparation

A witness report shall be submitted by chemical cleaning contractor in the format provided by LSTK contractor, after completion of the job to the satisfaction of PMC and Owner.

5. Operating Conditions

- 5.1 Degreasing Chemical: 1-2% Sodium Bi-Carbonate Solution (Soda Ash) + 200 ppm of non-foaming type non-ionic surfactant (Periminol OTS of M/s. ICI Chemicals, Thane / Surfa Additive X 100 from Kun Chem. Mumbai or equivalent / M/s. Navdeep Chemicals, Baroda).
- 5.2 Degreasing Temperature: 60-80°C. Circulate water at recommended velocity of 1 to 1.2 m/sec
- 5.3 Potable water can be used for making solution of the degreasing chemical. Heating of the chemical solution can be carried out by steam injection in the solution hold-up tank. In the event plant steam is not available, then contractor has to arrange his own heating facility by auxiliary boiler & heating coil.
- 5.4 Degreasing period: Degreasing process shall be considered complete when oil and grease level in circulating degreasing liquid becomes constant.
- 5.5 Temporary Tanks / Pump shall be used as hold-up tank for preparation of degreasing chemical solution.
- 5.6 One additional pump of adequate capacity need to be kept as standby by Contractor which will be taken back by him after completion of work.

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6. Degreasing Procedure

6.1 Preparation of Temporary Circuit: -

The cleaning shall be carried out by filling and circulating the specified solution in the specified sequence and conditions. Temporary piping and pump of appropriate capacity minimum 100 HP suitable for chemical cleaning to be used for the purpose. All necessary temporary piping, fittings, flanges, pumps, heater coils (if plant steam is not available for heating), boilers, thermometers, flow meter, pressure gauges and temperature gauges, valves, spares, temporary chemical analysis facility with all accessories required for conducting test during cleaning operation, chemicals and safety accessories shall be made available at site prior to chemical cleaning.

6.2 Fill the entire circuit with water. Circulate the water with pumps. Increase the temperature to 60-80°C by steam heating in amine tank / sump. Start adding required quantity of soda ash gradually in the amine tank/sump to attain a concentration of 1-2% in the circulating solution followed by 200 ppm non-foaming non-ionic surfactant. Continue circulation of the soda-ash to solution containing surfactant while maintaining the temperature at 60-80°C and monitoring concentration of soda-ash in the circulating solution at 1 hour interval. Follow all permissible operational procedures, including for draining of circulation chemical, as required for safe operation.

6.3 Using analysis, monitor and report oil / grease content every 4 hours in circulating degreasing solution. Continue circulation until oil / grease becomes constant.

6.4 Drain under permissible conditions. Rinse by several fillings and draining operation with DM water. Water used for rinsing shall be DM water only.

6.5 If amine blow down is used for receiving drained water, additional pump will be required to transfer the solution to the circuit.

7. Neutralization and Disposal

7.1 The necessary arrangement e.g. HDPE Tank / temporary neutralization pit shall be made for complete neutralization of surfactant and disposal system. Prior to discharging of the effluent in the sewer system, it shall be analyzed and if necessary, additional chemicals shall be added for neutralization so that discharged mixtures shall have pH of approximately 7.0 to prevent any damage to paving, manholes and sewers etc. Permission shall be taken from the Owner /PMC for disposal of neutralized effluent into storm water drain / nearest effluent pit.

8. Supervision, Monitoring and Certification of Chemical Cleaning Operation

8.1 The chemical cleaning operation shall be conducted under close supervision especially in the areas of chemical control by the contractor. The Monitoring report/ Log shall be prepared by the contractor which shall be reviewed by OWNER / PMC.

9. Precautions

9.1 All piping and vessels as per the scope P&ID shall be taken into circuit for degreasing. Strainers, demisters, activated carbon media, storage tanks and drainage system shall, however, be isolated.

9.2 All Insulation jobs shall be completed before starting degreasing operations.

9.3 HSE practices of the OWNER shall be followed by the contractor.