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Technical Conditions of Contract (TCC) for Catalyst Loading Works

FOR

IOCL Paradip-Standby SRU (525TPD) Train project

BHARAT HEAVY ELECTRICALS LIMITED

Maharatna Company	**Technical Conditions Of Contract (TCC)** **PROJECT ENGINEERING & SYSTEMS DIVISION** **HYDERABAD**	Ref No: HY/PE&SD/Projects/TCC/2023-24/Catalyst/01 Rev. No. 00

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TECHNICAL CONDITIONS OF CONTRACT (TCC)

FOR

CATALYST LOADING WORKS FOR

IOCL PARADIP-STANDBY SRU (525TPD) TRAIN PROJECT

Revisions: Refer to record of revisions	Prepared By:	Checked By:	Approved By:	Date
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Volume IA
Part I
Contract specific details

Chapter I- Project Information

1.0 Project Details			
1	Customer	:	IOCL, Paradip, Odisha
2	Project Information	:	IOCL Paradip-Standby SRU (525TPD) Train project
3	Location	:	Paradip, Odisha
4	Address Detail	:	IOCL, Paradip, Jagatsinghpur District, Odisha, India
5	Nearest Railway Station	:	Paradip Railway Station
6	Road Approach	:	118KM from Bhubaneswar via Cuttack and NH 53
7	Nearest Air Port	:	Biju Patnaik Airport, Bhubaneswar, Odisha, 125KM
11	Ambient Air Temperature (Average)	:	a) Maximum : 39^0 C b) Minimum : 16^0 C
12	Average Relative Humidity	:	71 %
13	Climatic Condition	:	Tropical Climate

Bidder is advised to visit the project site and appraise himself about the local conditions and infrastructure available in the area for fulfilling their commitments under the contract. BHEL will not admit any claims whatsoever on account of Contractor's non-familiarization of local conditions.

Chapter II- Scope of Work

1. The work to be performed under the scope of this tender mainly consists of but not limited to complete catalyst loading works in converter 1, and converter-2, including supply of manpower, catalyst loading tools, and fixtures to complete the work successfully. This catalyst loading work is for the first time as the converters are newly erected and not in operation.

   The catalyst will be supplied free by BHEL/ IOCL.

2. Scope of work:

Catalyst loading in Converter-1, and 2 (088-R-001, and 088-R-002): The scope of work includes but is not limited to the following within quoted rates. To carry out the activity as per the technical specifications and safety by Transportation of Catalyst/ Alumina/ Ceramic balls from the owner's storage yard to the erection site, storing the same near the erection site, supply/procurement, fabrication of all materials, hoppers, slide valves, equipment, cranes, tools, tackles, flexible sleeves, safety equipment for the operator, fire, etc., temporary platforms/shelters, etc. for loading, supply of required skilled/experienced personnel, removal of internals as required to facilitate loadings of catalyst/ Alumina/ Ceramic balls & storing the same properly to re-install the same, cleaning of equipment as required, carrying out preliminary checks, complying with Specific recommendations, installation of temporary structures /platforms, loading the Catalyst/ Alumina/ Ceramic balls as per the procedure/methodology specified with the use of hoppers, reinstallation of the internals removed and installation of all internals (grating, screen, etc.), carrying out leak tests, removal of temporary structures/platforms, and completing the work in all respects as per instructions of Engineer-in-Charge. BHEL will provide the cranes (Above 100MT Capacity) to carry out this activity

Work shall be executed as per the instructions of the BHEL site engineer. In case of any dispute, the decision of the BHEL site engineer shall be final and binding on the contractor.

Vendor's Scope of work includes:

1. Only trained and certified personnel shall enter and work inside the Reactor. Skilled manpower in adequate number to carry out all associated jobs on round the clock basis. Workers dumping the molecular sieve should wear gloves, eye protection, dust masks, safety shoes, and clothing that covers the body.
2. Loading of catalyst/ceramic balls shall be done in normal atmospheric conditions using sock loading method. Slow dumping of catalyst in the hopper shall be ensured. Levelling of catalyst beds and ceramic balls shall be done as per IOCL/Catalyst vendor Advice.
3. Video recording catalyst job using special camera (fireproof) and monitor (fireproof) for display. Agency shall submit video recording of catalyst loading job.
4. Safety precautions:
   a. Life support system with 3-way communication system.
   b. High pressure breathing air cylinders.
   c. High pressure breathing air re-filling compressor.
   d. Emergency escape bottles.
   e. Multi gas detector.
   f. Fall arrester.
   g. Whenever required a person shall go inside the reactor to level the catalyst bed and move the loading sleeve. Another person must be in attendance outside with equipment

instructions in case of emergency.

5. The entire job is subjected to stage wise BHEL/ IOCL/ Catalyst vendor inspection and clearance
6. All the jobs shall be carried out on round the clock basis.
7. Plastic lining of drums, sealing equipment, ropes, rope ladder, aluminum ladder etc.
8. Non-melting canvas for collecting spilled catalyst
9. Use wide boards or panels of plywood as a working platform inside the reactor. In no case should anyone be permitted to walk directly on the support balls or catalyst, as this causes holes in the support balls supporting the catalyst, and also breaks the catalyst rings.
10. Agency shall arrange torch, measuring tape, chalk, crayons or other type of markers to mark the level of catalyst to be loaded.
11. Final boxing up of all covers/elbow etc.
12. Hot bolting during plant startup if required.
13. Necessary blinding and de-blinding jobs.
14. Necessary Shed with good tarpaulin on Reactor platform. Water proof (and flame proof) tarpaulin for covering the catalyst drums, reactor/vessel inlet, for protection against ingress of rain/moisture.

The following is the list of drawings and specifications to be followed:

Sl. No	Description	Document #
1	GAD of 1st converter	080557C-26899053-PVE-A2001-007_2-C
2	GAD of 2nd converter	080557C-26899053-PVE-A2001-008_2-C
3	Job Specification For Catalyst /Packings Loading	080557C-000-JSC-0093-014_0
	All the documents are attached as annexure-II	

HIERARCHY

In case of any conflict/deviations amongst various documents, the order of precedence shall be as follows

- Statutory Regulations
- TechnipFMC / IOCL specification
- EIL specification
- Items in Schedule of quantities
- IS/BS standards

Scope Matrix:

S.N	DESCRIPTION	CONTRACTOR	IOCL
	MATERIALS AND EQUIPMENTS		
1	Vacuum Truck (Capacity-02 to 3 m3/Hrs.) along 04 nos. Big size Suction HDPE Hose of 100 Mtr. Length (Catalyst Loading) with all other Accessories.	√	**X**
2	Adequate numbers of all relevant equipment and auxiliaries for Inert Gas Man Entry inside Reactors viz. Man Breathing Apparatus Set, High pressure breathing air cylinders, High pressure breathing air re-filling compressor, Emergency escape bottles etc. (**If applicable**)	√	**X**
3	Arrangement with pulley and life line for retrieving the person from the vessel in case of emergency	√	**X**
4	Minimum 01 No. Hydra (New Generation Farana-14 MT) + 01 nos. Fork lift + 01 No. Trailer (40 Feet).	√	**X**
5	Rope Ladder of 20 Mtr Length and Rigid ladders (10 Mtr).	√	**X**
6	Winch/Tripod arrangements with Fall arrester & Full Body Harness. Structure for supporting winch to have proper certification.	√	**X**
7	Buffing tool for cleaning the inner surface of the Reactor shell and Internals.	√	**X**
8	Super sack bag shifting / handling including provision of drum cover lock nut up to/ from trailer including drum handling manpower and HDPE Bags. Stickers for spent catalyst drums identification.	√	**X**
9	Pneumatic Hoist (02 MT Capacity) or Winch System for Catalyst Loading activity along with handling of other Tools & Tackles	√	**X**
10	30 Mtr long Mechanical Roller Conveyor system for fast shifting of Catalyst Drum (**If required**)	√	**X**
11	Spent drum painting /letter writing including painter / letter writer and measuring tools (dip tape, etc.).	√	**X**
12	Catalyst Loading & Lifting Hoppers and required arrangement. Non-melting canvas for collecting spilled catalyst.	√	**X**
13	Mechanized Sieving Screentarpaulin, Catalyst Loading Hoppers, Polythene Bags etc.	√	**X**
14	Torqueing Machine & Bolt tensioning Machine with equivalent Manpower.	√	**X**
15	Long and Normal Socket as per the bolts size mentioned in the Reactors drawing for high temperature service along with D-Type Socket of each size.	√	**X**
16	MCC Panels, Cables and other required electrical items.	√	**X**
17	Supply and return hoses – Sufficient Quantity	√	**X**
18	Gate valves, Butterfly valves, Non Return Valves of various sizes in sufficient quantity.	√	**X**

19	TPI Certified Lifting Tools Tackles like Lifting belt, Chain Pulley Block, D-Shackle, Rope Sling etc. (To Handle Load up to 20 MT)	√	**X**
20	All precautions to be taken to avoid wetting of catalyst and open drums. Tarpaulins/Polythene sheets to be used to cover reactor manholes, catalyst drums etc. to protect from rain/moisture	√	**X**

Chapter III- Facilities in the scope of BHEL/Contractor

S. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.1	**ESTABLISHMENT**			
3.1.1	**FOR CONSTRUCTION PURPOSE**:			
a	Open space for office (as per availability)		Yes	
b	Open space for storage (as per availability)		Yes	
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipment, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc.		Yes	
f	Firefighting equipment like buckets, extinguishers etc.		Yes	
g	Fencing of storage area, office, canteen etc. of the bidder		Yes	
3.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
a	Open space for labor colony (as per availability)		Yes	
b	Labor Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	**ELECTRICITY**			
3.2.1	Electricity For construction purposes		Yes	Electricity shall be provided by BHEL/IOCL at one point on chargeable basis. Further distribution shall be done by contractor.
3.2.2	Electricity for the office, stores, canteen etc. of the bidder		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc.		Yes	
3.3.0	**WATER SUPPLY**			

S. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.3.1	For construction purposes		Yes	Water shall be provided by IOCL at one point on chargeable basis. Further distribution shall be done by contractor.
3.3.2	Water supply for bidder's office, stores, canteen etc.		Yes	
3.3.3	Water supply for Living Purpose		Yes	
3.4.0	**LIGHTING**			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc. during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**			
a	Téléphone, fax, internet, intranet, e-mail etc.		Yes	
3.6.0	**COMPRESSED AIR wherever required for the work**		Yes	
3.7.0	**Demobilization of all the above facilities**		Yes	
3.8.0	**TRANSPORTATION**			
a	For site personnel of the bidder		Yes	
b	For bidder's equipment and consumables (T&P, Consumables etc.)		Yes	

Sl. No	Description PART II 3.9.0 CONSTRUCTION FACILITIES	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.9.1	**Engineering works for construction:**			
a	Providing the construction/ fabrication drawings for all the works covered under this scope		**Yes**	Inputs shall be provided by BHEL
b	Drawings for construction methods			NA
c	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes		Yes	In consultation with BHEL
d	Shipping lists etc. for reference and planning the activities		Yes	In consultation with BHEL
e	Preparation of construction (Concreting B/W, etc.) schedules and other input requirements		Yes	In consultation with BHEL
f	Review of performance and revision of site construction schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
g	Weekly construction schedules based on S. No. e. hard copy to Construction manager, by email to HO.		Yes	In consultation with BHEL
h	Daily construction / work plan based on S. No. g. hard copy to Construction manager, by email to HO.		Yes	In consultation with BHEL
i	Periodic visit of senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two Weeks.		Yes	
j	Arranging the materials required for Work		Yes	
k	Coordination for inspection & checking and getting clearance from customer		Yes	

Sl. No	Description PART II 3.9.0 CONSTRUCTION FACILITIES	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
1	Preparation of formats for completion of activities		Yes	
3.10	**Work Permits, gate pass etc. from customer for manpower, machinery and material**		Yes	
3.11	Ambulance Services for contractor's site staff		Yes	

Chapter IV- Tools & plants to be deployed by Contractor

LIST OF TOOLS AND PLANT:

The following tools and equipment but not limited to, are required for the efficient execution of the civil works. The contractor shall make them available for construction purposes, including all consumables likely to be used at his own cost at the time of mobilization.

S.No.	Description	Minimum Quantity	Remarks
1.	~~Concrete batching plant (Stationary/Movable)~~	~~2 nos.~~	
2.	~~Needle Vibrator (Needle type 40mm)~~	~~4 nos.~~	
3.	~~Needle Vibrator (Needle type 25mm)~~	~~2 nos.~~	
3.	~~Surface Vibrator~~	~~1 no.~~	
4.	~~Concrete Pump~~	~~1 no.~~	
5.	Dewatering Pump	2 nos.	Need based
6.	~~Earth Compactor~~	~~2 nos.~~	Need based
7.	Reinforcement steel cutting & Bending machine	2 nos.	Need based
8.	Welding Machine	2 nos.	Need based
9.	Grinding Machine	4 nos.	Need based
10.	Excavator	1 no.	Need based
11.	Theodolite with staff	1 no.	Need based
~~12.~~	~~Dumpy level with staff~~	~~1 no.~~	~~Need based~~
~~13.~~	~~Compression testing machine (for concrete cubes)~~		~~Need based~~
~~14.~~	~~Cube mould (15cm x 15cm x 15cm)~~	~~6 nos.~~	~~Need based~~
~~15.~~	~~Sieve analysis sieve sets for coarse & fine aggregates~~	~~1 set~~	~~Need based~~
~~14.~~	~~Jar/Beaker for Bulk density test of sand~~	~~1 no.~~	~~Need based~~
15	Special loading device (As per specifications and feasibility)	1 No	Need based
16	Tooling, lighting facilities, dust masks, respirators, safety harnesses		Need based
17	Vacuum cleaner	1 No	Need based

BHEL will not provide any tool, plants, facilities or any testing facility/apparatus for the work. It will be contractor's responsibility to arrange all required tools, plants and other testing apparatus, etc. at their own cost. The prices quoted & finalized are inclusive of the charges towards providing such T&P. No extra payment will be entertained because of this.

However, subject to availability, BHEL may provide few T&P to the contractor for expediting and in larger interest of the project. In case any such facility is provided to the contractor, BHEL will make necessary recovery in the running account/final bills towards the hire charges. A departmental charge @ 5% will also be affected such cases. The decision of BHEL on the hire charges will be final and binding on contractor.

Chapter V- Time Schedule

5.1 TIME SCHEDULE

5.1.1
The entire work of Catalyst Loading Works as detailed elsewhere in the Tender Specification shall be completed within **30 Days** from the date of commencement of work at site.

5.1.2
During the total period of contract, the contractor has to carry out the activities in a phased manner as required by BHEL and the program of milestone events.

5.1.3
The work shall be commenced on the mutually agreed date between the bidder and BHEL engineer. The decision of BHEL in this regard shall be final and binding on the contractor. The scope of work under this contract is deemed to be completed only when so certified by the site Engineer.

5.2 COMMENCEMENT OF CONTRACT PERIOD

The date of commencement of contract period shall be the mutually agreed date between the bidder and BHEL engineer to start the work. In case of discrepancy, the decision of BHEL engineer will be final.

5.3 MOBILISATION

5.3.1
The activities for "Catalyst Loading Works" shall be started as per directions of Construction manager of BHEL.
5.3.2
The contractor should mobilize manpower in order to complete the work in **30 Days.**
5.3.3
Requisite Material, men and machinery should be arranged in order to complete the project within stipulated time.
5.3.4
The contractor has to augment his resources in such a manner that following major milestones of the project are achieved on specified schedules:

In order to meet above schedule in general, and any other intermediate targets set, to meet project, contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL.

5.4 CONTRACT PERIOD

For the purpose of contract, the period shall be taken **as 30 Days.** Completion of the work shall be as per BHEL Bar Charts revised from time to time. In order to expedite the work, the contractor has to deploy manpower as per site requirement without any extra cost to BHEL.

5.5 GUARANTEE PERIOD

The guarantee period of twelve months shall commence from the date of completion of all works as certified by the BHEL site engineer.

5.6 PROTECTION OF WORK

The contractor shall have total responsibility for protecting his works until it is taken over by the Employer. No claim will be entertained by the Employer or the representative of the Employer for any damage or loss to the Contractor's works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings. Should any such damage to the Contractor's Works occur because of other party not being under his supervision or control, the Contractor shall make his claim directly with the party concerned.

If disagreement, conflict, or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the Contractor's Works the same shall be rectified. The Contractor shall not cause any delay in the repair of such damaged Works because of any delay in the resolution of such disputes. The Contractor shall proceed to repair the Work immediately and no cause thereof will be assigned pending resolution of such disputes.

Chapter VI- Statutory Regulation

6.1 GST: For All types of works excepting works covered under sl no 6.2

6.2 BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998 and

INTER-STATE MIGRANT WORKMEN ACT, 1979 (IN CASE BIDDER ENGAGE MANPOWER FROM OTHER STATE)

In case any portion of work involves execution through building or construction workers and/or inter-state migrant workers, then compliance to the above titled Acts as applicable shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances, it may be ensured as under:-

It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a license to the Competent Authority under the BOCW Act and/or ISMW Act as applicable and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of license / permission to BHEL within a period of one month from the date of award of contract.

It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these acts and rules including that of payment / deposit of cess as per the applicability under above referred Acts within a period of one month from the receipt of payment.

It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building/Inter-state Migrant workmen) engaged by the sub-contractor during the preceding month.

It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.

Chapter VI- Field quality control plan

1. Work shall be executed as per approved field quality control plan (FQCP). Indicative quality control plan of IOCL is attached as Annexure-IV. Contractor shall prepare, submit the field quality control plan in line with IOCL QCP.

Submitted FQCP shall be reviewed and approved by BHEL/IOCL/ TECHNIP.

Chapter VIII: HSE (Health, Safety, Environment) and PPE (personal Protective Equipment) Guidelines

1. Contractor shall follow all the HSE guidelines as mentioned chapter IX off SCC, and IOCL (Annexure-I).
2. Contractor shall deploy one (1) number of qualified and experienced safety officer for the entire period of contract.
3. Contractor shall submit the biodata of safety officer to BHEL/Customer (IOCL), for approval.
4. In case of any dispute/ contradiction, IOCL HSE rules and guidelines shall prevail.