

TOTAL TORPEDO LADLE MANAGEMENT (TTLM) AT BSP

Scope of Work on supply and apply basis:

Performance Guarantee and Scope of work for Refractory lining of 350 T capacity Torpedo Ladle Car (TLC) on supply-cum-application and subsequent maintenance basis as required till the end of campaign:

A) General Terms and conditions:

1. This proposal is for procurement of refractory for Torpedo Ladle Car (TLC).
2. The Bidders/their technical representatives are required to visit the Workplace site at Bhilai Steel Plant in person & may discuss with RED prior to bidding and give a declaration as under;

“We have visited the Torpedo Ladle Car (TLC) unit and understood all the details, including size and dimensional tolerances of each entity of the BOM pertaining to refractory of TLC. We are in a position to manufacture & deliver all materials required for TLC and shall also be able to get the dismantling, lining and gunning application done as per the site conditions”.

3. The contact person for any technical query is GM (RED-PP), Mobile – 9407981728.
 4. Following types of relining/repair shall be done to Torpedo Ladle.
- **Category-1:** Total relining & dismantling of back-up lining & working lining refractory. It shall be carried out once at the beginning.
 - **Category-2:** Complete changing of spout castables, complete changing of refractory bricks of striker pad back-up lining, working lining & nearby eroded working and back-up lining including semi-rings working lining and repair/patching of slag zone and other eroded areas as per the requirement / condition, which also includes dismantling activities.

Number of Repairs allowed: Maximum two numbers of Category-2 repairs shall be allowed during the campaign to achieve desired guaranteed life. If a third Category-2 repairs needs to be carried out, it will be mutually agreed upon. However, the decision of Refractory Department Officer I/c will be final in allowing the 3rd repair of Category-2. Party has to ensure a straight life of minimum 550 heats. A penalty of Rs. 4000 per heat shall be levied for number of shortfall heats from 550 for reasons attributable to refractory material / services.

Example: If straight life achieved 500 heats, then penalty will be Rs. $[(550-500) \times 4000]$ = Rs. 2.0 Lacs.

Minor patching work and casting in spout area is permitted with prior approval of BSP time to time, limited to maximum 3 times over and above Cat-2 repair.

Selective hot gunning shall be allowed in consultation with Refractory Department Officer In-Charge without affecting ladle availability. However, suitable gunning materials along with gunning machine (inclusive of spare parts and tools & tackles) shall be arranged by the vendor on Free of Cost (FOC) basis.

Note: No modification in TLC shell and other mechanism is allowed.

5. Vendor shall stand guarantee for 1300 heats (with repairs as mentioned above) for TLC refractories.
6. **Delivery required:** Parties shall confirm supplying at least 1 set per month and delivery to start within 60 days from the date of issue of PO/LOA. However requirement may vary as per shop requirement and same shall be binding on the party. Party is required to submit finalized BOM within 15 days from date of issue of LOA. If party fails to submit finalized BOM within 15 days, a penalty of Rs. 5,000/- per day or part thereof, shall be levied and the same shall be deducted from the first performance certificate issued by BSP.
7. **Inspection:** Material shall be received at BSP store based on party's TC-GC.
8. BSP reserves the right to divert, cancel, or short-close the order quantity and make alternate procurement at the risk and cost of the party, if delivery commitment / performance of any party are found consistently poor at any point of time and not acceptable to Bhilai Steel Plant.
9. The decision for continuing of TLC in circulation or putting down for dismantling will be taken jointly by BSP & the party. However, the final decision will be of the BSP & the same is binding on the Vendor.

10. Evaluation of total ranking shall be as per party's quote in terms of:

- (i) Cost per one set of material on LCNITC basis.
- (ii) Application cost (including dismantling, relining and maintenance activities) for 1 set.

Note: Evaluation will be done on overall basis i.e. quoted value for material and quoted value for application shall be clubbed together for evaluation purpose.

B) Payment Terms:

1. The Performance Guarantee & Bonus-Penalty Clauses shall be applicable only on the refractory material supplied in Ex-Works basis.
2. Performance shall be evaluated on set to set basis only.

3. Payment Terms for material Cost:

- a) Payment of 80% of the material cost & 100% of taxes, freights and duties shall be released based on the receipt of the material at BSP stores.
- b) Balance 20% payment of the material cost (BOM quantity for initial lining for desired guaranteed life) shall be released after every month on pro-rata basis, based on the respective torpedo ladle set life in heats, against 20% Bank Guarantee (BG). The BG will be returned after completion of the Purchase Order (PO).

Bonus/recoveries shall be duly adjusted at the time of final payment of every set at SAIL/Bhilai Steel Plant.

- c) For Bonus – penalty calculation party is required to submit Ex-work Set cost of the materials separately.

4. Payment terms for Application activity :

- a) 80% of the application activity for dismantling and relining shall be released after initial dismantling and installation of torpedo set upon certification by BSP.
- b) Balance 20% of the application activity shall be released based on the final certification by BSP on maturity (i.e. end of the campaign). Bonus/recoveries shall be duly adjusted at the time of final payment /running bills of every set at SAIL/Bhilai Steel Plant.

5. Desired guaranteed life, applicable Bonus & Penalty Clause :

- i. Cost per Set of material (Ex-works basis) --- Set Cost
- ii. Minimum desired guarantee life = 1300 heats
- iii. Heat cost or Cost / Heat = Set Cost / 1300
- iv. Shortfall heats = Guaranteed Life (i.e., 1300 heats) – Actual achieved heats

Life Achieved	Payment terms
less than or equal to 650 heats	Nil Payment
between 651 heats to 900 heats	Set Cost – Penalty Penalty will be levied @125% of the heat cost for shortfall heats
between 901 heats to 1299 heats	Set Cost – Penalty Penalty will be levied @100% of the heat cost for shortfall heats
1300 heats	Set Cost
above 1300 heats	Set cost + Bonus Bonus shall be awarded @ 50% of heat cost for every extra heat beyond 1300 heats

Examples:

- Life achieved is 400 heats = Nil Payment
- Life achieved is 700 heats = Payment = Set Cost – Penalty
= Set Cost – [(1300-700) x Heat Cost x 1.25]
- Life achieved is 950 heats = Payment = Set Cost – Penalty

$$= \text{Set Cost} - [(1300-950) \times \text{Heat Cost} \times 1.0]$$

- Life achieved is 1300 heats = Payment = Set Cost
- Life achieved is 1400 heats = Payment = Set Cost + Bonus

$$= \text{Set Cost} + [(1400-1300) \times \text{Heat Cost} \times 0.50]$$

- v. The Torpedo Ladle sets, removed from circulation because of non-refractory reasons such as mechanical/operational reasons etc. would be excluded while doing averaging. The average is calculated by taking the Life of all the Torpedo Ladle matured sets (excluding ladles which have matured below 651 heats) till date under the purchase order to respective vendor except those sets which have been put down below desired minimum guaranteed life due to reasons mentioned above. An average life of 832.4 will be taken as 832 heats and 832.5 will be taken as 833 heats. (Average life for payment purpose will be considered up to 1st place of decimal only).
- vi. In case of non-refractory failure as in 5. (v) above, the payment will be made for that Torpedo Ladle set either as per the actual life of that set, or the average life of matured sets till date under the purchase order for that Vendor, whichever is higher.
- vii. In case all Torpedo ladle sets of a Vendor are removed from circulation as per clause 5. (v) above and there is no average life of matured sets till date under the respective purchase order, the sets will be considered as having achieved the desired guaranteed life and the payment will be made for that Torpedo Ladle set either as per the actual life of that set, or the Desired Guaranteed Life, whichever is higher as per the bonus penalty clause.
- viii. **For any ladle break-out (i.e. Metal Through) :**
 - a) If it is due to non-refractory reasons such as mechanical/operational reasons etc., actual life or average life achieved in the same purchase order till that date, whichever is higher shall be taken into account for the payment of such ladles as per bonus penalty clause. If this situation happens for the first ladle, the payment will be made for that Torpedo Ladle set either as per the actual life of that set, or the Desired Guaranteed Life whichever is higher as per the bonus penalty clause.
 - b) In case of Metal leakage during the ladle life between 651 heats and 900 heats (both inclusive) due to poor quality of supplied refractory, payment will be made assuming that the ladle has matured at life of 651 heats. In case of Metal leakage during the ladle life between 901 heats and 1299 heats (both inclusive) due to poor quality of supplied refractory, payment will be made assuming that the ladle has matured at life of 901 heats. If the leakage occurs above the desired heat guarantee (1300 heats), payment shall be made based on the actual life of that ladle as per bonus penalty clause, however, a lump sum penalty of Rs. 1.00 lakh (Rupees one lakh) shall be levied on the supplier. The decision of the BSP in such a case will be final and binding. Ladle life in this case will be considered for monthly averaging also.

- c) In case of Metal leakage during the ladle life below 650 heats due to poor quality of supplied refractory, an additional lump sum penalty of Rs. 5.0 Lakh shall be recovered from the vendor, over and above the payment calculated as per bonus-penalty clause.

C) SET QUANTITY, LINING THICKNESS, QUALITY OF MATERIALS:

1. **Bill of Material:** Party has to submit Bill of Material per set and is required to be approved by BSP and the same shall be binding on party. Vendor has to ensure to supply the complete approved Bill of Material per set. Any shortfall of supply from approved Bill of Material shall be liable for deduction of equivalent amount to the tune of cost of material which are not supplied. However any additional quantity needed during the campaign per set shall be supplied by Vendor free of cost. BSP shall however avail IGST credit against the relevant IGST documents submitted by the Vendor and reimburse the same to the Vendor. Tentative BOM is as under -

Sl. No.	Quality	Shape No.	Unit Weight (kg)	Quantity per set (Pcs)	Quantity (T)
1	ASC	A-1	17.80	418	7.440
2	ASC	A-2	15.90	3171	50.419
3	ASC	1/2 A-2	7.90	67	0.529
4	ASC	A-3	18.00	408	7.344
5	ASC	A-4	11.90	1275	15.173
6	ASC	A-5	13.00	105	1.365
7	ASC	A-6	15.60	13	0.203
8	ASC	A-7	14.80	13	0.192
9	ASC	A-8	13.90	13	0.181
10	ASC	A-9	12.60	13	0.164
11	ASC	A-10	12.10	126	1.525
12	ASC	A-11	11.60	1080	12.528
13	ASC	A-12	10.80	1148	12.398
14	ASC	A-13	10.00	342	3.420
15	42% Alumina	N-1	5.60	4032	22.579
16	42% Alumina	N-2	2.50	488	1.220
17	42% Alumina	N-3	5.50	736	4.048
18	42% Alumina	N-4	5.40	816	4.406
19	42% Alumina	N-5	5.20	304	1.581
20	Insulation	Q-1	1.2	4301	5.161
21	Insulation	Q-2	1.2	745	0.894
22	Insulation	Q-3	1.2	829	0.995
23	Insulation	Q-4	1.2	326	0.391
24	Mortar- ASC	ASC brick mortar HM-SC3			3.0
25	Mortar F'Clay	Fireclay mortar NJ-42			3.5
26	90% Castable	90% Alumina castable CST-TP7			7.0
27	Castable	Alumina clay castable FL-130			15.0

Grand Total	182.656
--------------------	----------------

Note: Item No. 24 to 27 should have minimum shelf life of 6 months.

2. Supply of Material: Party shall supply the material on complete set basis. If the FOC material required for repair is not available and in order to maintain the continuity of the circuit, material is drawn from the other set available, then a penalty @ Rs. 10,000 per day shall be levied, till the repair material is received in totality, at BSP stores.
3. For any exigencies to maintain the ladle circuit, if BSP provides gunning mix or any other materials or services, then 2.0 times (double) of the equivalent material/service cost calculated by BSP, which shall be final & binding, shall be deducted from the final / running bill.
4. If supplier withdraws his consent for further circulation of the TLC after/before achieving the guaranteed life and subsequently the TLC is taken into circulation with the initiation of BSP, payment shall be made up to the life at which supplier has given his consent only.
5. All the left over items after completion of the order execution shall be considered as BSP material without any claim by the Vendor, if the material is the part of approved BOM. However any left out material supplied on FOC basis shall be the vendor's property. The vendor has to lift the FOC material from site/store within 30 days from the date of completion of the PO. Beyond 30 days, BSP would be free to use the material or dispose of as deemed fit.
6. The supplier shall select suitable quality of materials so as to achieve the guaranteed life. However, they are required to submit detailed lining drawing, mentioning working volume of the torpedo ladle, BOM and typical specification of refractory materials along with their offer for scrutiny. For working lining, quality of the bricks shall be Al-SiC-C only. No other quality in the working lining is acceptable. Only one change in lining pattern and/or specification is permissible during the contract period subject to approval from BSP.

D) VENDOR'S SCOPE:

1. Supply of refractory materials at BSP stores. All the items shall be palletized separately as per set quantity. Description of the item, quantity, PO No. and Date, Set Number/FOC, Vendor's name shall be clearly stamped on each pallet. All the monolithic items shall be supplied strictly in 25 Kg. bags and then palletized, with similar details as mentioned above along with manufacturing date printed on each bag. All the bricks shall be stamped with item no. & Vendor's name. Complete packing list shall be provided by the vendor along with the sets.
2. Dismantling of old refractory lining, including minor metallic jam removal if any, before starting the refractory lining for Category 1, Category 2 repair and minor patching work as mentioned in clause no. A (4). Dismantling/relining/repair jobs to be carried out on round the clock basis.
3. Dismantling and relining /repair jobs are strictly to be performed as per the schedule given by BSP. Ladle availability has to be ensured so that sufficient numbers of ladles are available for production.
4. Two coats of red-oxide / better quality painting are to be applied on the inside shell of TLC. Supply of paint and brush is under the scope of Vendor on FOC basis.
5. Supply of suitable anchors and welding of the same shall be in the scope of Vendor. Design of the SS anchor, along with anchor spacing and quality and quantities of anchors are to be

- furnished to Refractory Department for approval before commencement of the job.
6. Vendor has to ensure monitoring of the TLC round the clock with the help of suitable temperature measuring gun and report the same to the BSP site in-charge at the end of every shift, while in operation & any abnormality observed should be brought to the notice of Refractory Department / Shop immediately and the same shall be required to be recorded at site by the successful bidder. Failure to deploy work force for monitoring shall attract penalty @ Rs.2000/shift. Decision of BSP representative (Refractory Department / Shop) will be final & binding regarding the continuation of the TLC in circulation or putting down for repair/de-bricking.
 7. For de-bricking and relining, all the tools, tackles including pneumatic/electric breakers with chisels, castable mixer, vibrator for the castable application, brick cutting machine. including blades, formats etc., shall be arranged by the Vendor.
 8. To carry out the relining as per the schedule given by BSP.
 9. Vendor is required to arrange welding machine, gas cutting machine, suitable welding electrodes, grinding machine etc., as per requirement to carry out the mechanical repair of spout. The Vendor / Contractor shall ensure usage of ISI marked regulator, hoses, nozzles, cutting torches, welding holders and cables for the cutting and welding works. This must be adhered strictly.
 10. Vendor shall draw the electricity, water, compressed air connection from the sources which exists at Torpedo Ladle Repair Shop (TLRS). Any extra facility like air compressor, if required, is to be arranged by the Vendor free of cost. Vendor shall arrange all the necessary electrical appliances like electrical wire, bulb etc., for illumination inside the TLC.
 11. TLC mouth castable casting shall be carried out with castable mixer and vibrator.
 12. Vendor has to furnish the pre-heating schedule for new and repaired TLC and monitor the preheating.
 13. All the vent holes shall be cleaned before starting of lining activity.
 14. Unloading of refractories transported from refractory stores to site for relining/repair and cleanliness shall be in the scope of Vendor.
 15. Forklift for loading/unloading/shifting of the material/equipment shall be provided by BSP, however Forklift operator for the same shall be arranged by the vendor. The Forklift operator of the vendor shall hold a valid LMV Driving License.
 16. Housekeeping of entire relining area shall be in scope of the vendors. All the debris and waste materials shall be put in a designated area marked by BSP. Violation of the above shall be treated as violation of safety norms and penalty may be imposed based on the severity.
 17. Preheating of TLCs shall be under the Vendor's supervision with the existing available facility at BSP.
 18. Responsibility for safe custody of the materials / equipment at site.
 19. Performance/execution records need to be maintained.
 20. In case parties do not deploy manpower for timely repairs (both CR's and Patching) or the repair activities are held up / delayed for the reason, which is entirely attributable to the vendor (like, non-availability of manpower or machine), then a penalty of Rs. 10,000 (Ten Thousand Rupees Only) per shift or part thereof and up to maximum Rs. 1,00,000.00 (1.0 Lac) in each case, shall be deducted from their bills.
 21. Gunning provision: Party may be allowed for gunning of ladle, for enhancement of life with its own manpower, material and machine, and taking due safety appliances and precautions. However, BSP reserves the right to spare the ladles for gunning depending upon operational requirements.
 22. Party has to ensure technical representatives and skilled manpower for execution of relining, dismantling, gunning and monitoring of TLC during the campaign.

23. Party shall be allowed to sub-let the application part of the Work (if any), as per standard BSP procedure, only with the written consent of the Employer (Bhilai Steel Plant) and such consent if given shall not relieve the Party from any liability or obligation under the contract.
24. Plastering of torpedo ladle car both side platforms and canopy of equipment chambers with suitable castable on the initial lining and as and when required.

E) BSP'S SCOPE:

- 1) Providing storage space for refractory material / equipment at Torpedo Ladle Repair Shop site.
- 2) Transportation of refractory materials from BSP Refractory stores to Torpedo Ladle Repair shop including loading (at Stores) on a free of cost basis.
- 3) Providing services like water, electricity, compressed air, oxygen, etc., available at TLRS at free of cost as per existing facilities.
- 4) Lancing of heavy Metallic skull / Jams shall be done by BSP before handing over for dismantling by Vendor.
- 5) Jam removal during the course of operation of ladles shall be done by BSP as per the practice in vogue; however any refractory patching/repair required shall be done by Vendor as and when required. Such undertaken repairs shall not be counted under Category-2 repair defined above.
- 6) Repairs undertaken due to operational reasons shall also be excluded from counting under Category-2 repair defined above. However, refractories required for the same shall be supplied by the Vendor Free of cost, if the total requirement during the campaign of such ladle exceeds the BOM/Set.
- 7) Shop EOT crane, as available, shall be provided free of cost. Vendor should have arrangement for shifting materials inside the TLC for lining i.e. webbing slings, ladder etc.
- 8) Forklift shall be provided by BSP.

F) STATUTORY REQUIREMENTS:

1. All safety procedures of BSP shall be followed by the vendors including using of proper safety appliances by the workmen of the Vendor.
2. All procedures, conditions and statutory requirements shall be fulfilled by the vendors which are in vogue at BSP with respect to engagement of manpower.
3. Penalties as imposed by the Safety Department of Bhilai Steel Plant, in case of violations of safety norms, shall also be applicable as per the prevailing norms of BSP and standard guidelines of safety as in existence at Bhilai Steel Plant.

