

I. SCOPE OF WORK:

The work mainly comprises of Preventive Maintenance (PM) and Breakdown (BD) maintenance and general up keep of EOT Cranes/Jib Cranes. All type of crane related maintenance work other than Radio remote control & VFD/ PLC/ Load cell related work are required to be carried out by the contractor for 2 year, 2 shift basis. Normal working in factory is done in 2 shift basis. Shift timings are from 7.00 am to 3.00pm for Ist shift timings & IInd shift are from 03:00 pm to 11:00pm. The preventive maintenance of 75 nos. critical EOT cranes has to be done thrice in a year & rest 181 nos EOT crane preventive maintenance to be done twice in a year. The preventive maintenance of JIB cranes shall be done twice in year. PM is normally carried out including Sunday- working from 8.00 am to 5.00 pm. However, during holiday, critical breakdown restoration of Crane is also required to be done on need basis.

Minimum manpower to be deployed for the total contract will be as per table below:

Group	Skilled worker	Unskilled worker
A	13	14
B	9	9
	22	23

However in case of emergency, contractor has to increase manpower accordingly.

- A. EOT CRANES:** Total of 257 Nos EOT Cranes (includes Gantry Cranes, Goliath Crane, Semi-goliath, HOT crane) ranging from 1 Ton to 300 Ton. Apart from above, 7 Nos state of art crane portion of ASRS (Automatic storage retrieval system) wherein approx. 2 Ton stacker Crane is also required to be maintained.
- B. JIB CRANES:** Total of 480 Nos Jibs cranes are required to be maintained. These Jib Cranes possesses hoist of SWIFT, MUNK, TAK, J K, Indef, TITAN etc varying from 350 Kgs to 5 Ton.

1.1 EOT CRANE

Here, the work includes attending breakdowns promptly as when reported daily, regular monthly check-ups, Preventive and breakdown maintenance of the EOT Cranes, its DSL, DSL indication, DSL cable connection to DSL main switch and Main switches distribution boards etc. All electrical / Mechanical / Hydraulic & Structural (Minor) breakdown maintenance is to be done by the contractor including its supervision/ Execution part in both shifts including work in our weekly off. (However, during production peek; work in the third shift (01:00 am to 07.00 am) or even on holiday may also be done in some areas as instructed by the In-charge crane section).

- 1.1.1. Each of the major production location is required to be supervised by competent supervisor for carrying out day -to- day maintenance work and preventive maintenance work efficiently.
- 1.1.2. Preventive Maintenance work of EOT Cranes (Twice a year for each crane) should confirm to our check list provided with the PM docket.
- 1.1.3. Total Nos of EOT Cranes is around 257, any additional crane(s) (if it adds. during the period should be covered automatically under the purview of this contract. Around 12 Nos EOT Cranes are likely to be inducted) Although guarantee is provided by the crane OEM but for

smooth operation & day to day maintenance is to be carried out by the Contractor engaged in the block / extended block area; where crane is operating. List of EOT Cranes are attached. However capacity wise EOT/ Gantry/ Semi Goliath crane are reproduced for ready reference at is as under

S. No.	EOT crane/ Goliath / Semi Goliath/ HOT crane	Quantity (Nos)
1	EOT Cranes capacity >50T and above	29
2	EOT Cranes capacity >=25T but below 50T	44
3	EOT Cranes capacity >=10T < 25T	79
4	EOT Cranes capacity of = > 5 Ton <10 Ton	46
5	EOT Cranes capacity < 5Ton	59
		257

- 1.1.4. As our company being accorded with ISO-9001, ISO-14000 , OHSAS 18001, You are requested to carry out qualitative work and environment friendly activities and necessary documentation /paper work for the purpose shall also be maintained.

1.2 JIB CRANE

- 1.2.1 Daily Breakdown work and Preventive Maintenance (Twice in a year) shall be done as per the instruction issued by the department. In a year, one time major Preventive maintenance work shall be carried out after lowering of Hoist. For this necessary documentation shall be done / maintained. The breakdown maintenance will be carried out immediately on receipt of complaint from production shop by the contractor's personnel who shall be posted for full time in 1st & 2nd shifts. The place for stationing the contractor's personnel inside the works shall be provided by BHEL.
- 1.2.2 Total Number of jib cranes is in the tune of 480 Nos. Any other Jib crane (s) added hereafter has to be covered under the purview of this contract. As Jib Cranes are relocated to other locations as per the requirement of Production & also Hoist are replaced by new generation hoist or due to urgency of work hoist may be relocated.

1.3 Maintenance work for EOT / Jib Cranes shall be broadly categorized as under:

A. BREAKDOWN MAINTENANCE:

MECHANICAL:

- General checking of the Crane.
- Topping oil in the gear boxes.
- Checking lubrication of crane.
- Lubrication of wire ropes.
- Replacement of LT/CT wheels including bearings, wheel shafts, couplings, pedestals, gears, etc.
- Drive mechanisms - LT, CT and hoist motions, replacement of gear boxes, bearings, oil seals, gaskets, gears, input/output shafts, couplings, coupling bolts, drive shafts, pulleys, etc.
- Wire Ropes - Replacement of worn out/broken/crushed/damaged wire ropes, arranging for wire rope clamps.
- Hook block of hoists - Replacement of damaged / worn out hooks. Replacement of damaged / defective pulleys and any other damaged components of the hook blocks. Checking and replacement of crane CT end stoppers on LT and CT motion.
- Restoration of trolleys / EOT crane at the time of derailment.
- Checking and repairing bogie system on end carriages and repairing damages to structures.

11. Checking and replacement of brake units / brake liners, replacement of springs, adjustment of studs etc.
12. Maintenance of End stoppers.

ELECTRICAL:

13. Attending breakdown of electrical nature.
14. Replacement / minor repair of motors.
15. Replacement of fuses / fuse holders in electrical panels.
16. Replacement of contactors or contact points, if necessary.
17. Replacement of cables.
18. Repair / replacement of incoming mains switches on panel.
19. Replacement / checking of brake units.
20. Maintenance of junction boxes of CT, LT, MH, AH, Pendant, etc.
21. Repair / Replacement of cable trolleys.
22. Repairs / Replacement of floor operation push button pendant including push buttons
23. Repair / Replacement of master control switches.
24. Topping / Replacement of oils in brake units.
25. Tightening loose connection on terminal boards.
26. Checking / Repair / Replacement of CT, LT rotary and counter weight limit switches.
27. Repairs / Replacement of Gong bell/ Hooter/ Crane Lights.

DOWN SHOP LEADS MAINTENANCE:

28. Cleaning of DSL lines.
29. Tightening of Porcelain insulators and replacement.
30. Replacing / checking of current collectors.
31. Alignment of DSL lines.
32. Checking of power supply connections and DSL lines (Power feeding).
33. Repair / Replacement of power cables for DSL lines.
34. Replacement of Indicating lights

CLEANING OF CRANES:

35. All cranes platform / cabin to be cleaned 2 (during PM) times in a year at regular intervals to remove any kind of waste materials / dust / oils / grease, unused cables, etc.

B. PREVENTIVE MAINTENANCE:

The preventive maintenance of 76 nos. critical EOT cranes has to be done thrice in a year & rest 181 nos EOT crane preventive maintenance to be done twice in a year. The preventive maintenance of JIB cranes shall be done twice in year. A check list / PM tickets are provided as per Crane section form & contractor is required to submit back after proper filling & signing of the same.

- 1.4** The maintenance and repairs for EOT / JIB cranes will be done on works contract basis while the spares and components, including consumables as required shall be provided by BHEL. The defective parts replaced, shall also be repaired by the contractor to the extent possible free of cost. The components needed for such repairs shall be provided by BHEL.
- 1.5** The contractor must be equipped with sufficient test equipment, Pulley Blocks, Hook-Chook (Pulling machine), Requisite tools & tackles for AMC work (set of Spanner, Allen key, Screw

driver, Pliers etc), Multi-meters, Tongue- tester, etc. needed for normal mechanical / electrical repairs of cranes.

- 1.6** Contractor's Supervisor must be minimum ITI (Electrical / Mechanical / Electronics field with minimum 5 years' experience) & should have sufficient exposure on repairing EOT/ JIB Cranes with Structural/electrical, Mechanical & Hydraulic operated system. Although specialized electronic maintenance is taken care by BHEL separately.

II. PERIOD OF CONTRACT

The period of contract will be for two years from the date of start of work as per work order i.e. **from 01-07-2022 to 30-06-2024 for Group A cranes and from 04-07-2022 to 03-07-2024 for Group B** on 2-shift basis work. In case of demand from the concerned production block emerges, then III shift basis working may be required to cater the needs of the production peak period as instructed by In-charge Crane section.

III. Other applicable terms & Conditions.

- 3.1 Contractor shall arrange his own tools and tackles for removal, dismantling, assembling and reinstallation of hoist / motors / Gear boxes etc. However, all spares including consumables like gear oil, Thruster oil, Dash-pot oil, Electrodes, Grease, cotton waste, contactors, relays, etc, facilities like gas cutting, welding, machining facility, repair, rewinding of motors, coils, etc shall be provided by BHEL at free of cost at ground level. But vigilant action for better parts / methods is to be adopted voluntarily by the contractor to minimize the break- down time.
- 3.2 The cranes shall be maintained at an average uptime not less than 98.7% of the total available time.
- 3.3 Fitter / Rigger / Electricians / Welder shall be deployed by the contractor to carry out the work smoothly & safely.

No further offloading of the work either by outsourcing labour / sub contracting of work is allowed. Power of attorney/subletting will not be accepted for execution of work.

- 3.5 Contractor shall maintain all records like work requisition forms, spares list, all other records pertaining to his work.
- 3.6 A Daily breakdown report and monthly breakdown report, Preventive Maintenance Completion report and report of major work is to be submitted to the In-charge Crane section after their endorsement from concerned Block Maintenance In-charge.
- 3.7 Contractor shall maintain a bank account in any of the nationalized banks with Internet Banking facilities at Bhopal. This should be suitable for e-payment by BHEL.
- 3.8 Contractor's bill shall be processed until the monthly wages of workers, their PF, ESI as applicable are paid.
- 3.9 No excuses for hindrance viz. jungle, extreme weather condition, non-availability of labor etc. will be entertained for not completing the work.

IV. MISCELLANEOUS CRANE MAINTENANCE ACTIVITIES:

- 4.1 Collection of spares /material from various stores and blocks to work place/site shall be carried out by contractor.
- 4.2 Cleaning, stacking, sorting handling and upkeep of crane maintenance stores, work center stores shall be carried out by contractor.

- 4.3 Salvaging/repair work of crane spares & other crane items shall be carried out by contractor.
- 4.4 In case of urgent breakdown, the contractor shall have to retain their staff as per the requirement; BHEL will not pay any compensation on this account.
- 4.4 It will be responsibility of the contractor to give requirement of spare parts from time to time well in advance.

V. RECORDS OF MAINTENANCE: Contractor shall maintain following records:-

- 5.1 Down time history records EOT crane wise in a register for each Crane.
- 5.2 Record of daily complaints received in writing/ telephonically/ online/ face-to-face, preventive & break down maintenance, replacement/ modification maintenance, indicating work carried out, spares replaced, pending work, etc. on PC if provided by BHEL also.
- 5.3 Record of Crane preventive maintenance work shall be done as per the check list given, and filled up by the person doing the work himself.
- 5.4 Daily breakdown reports
- 5.5 Staff attendance and payment records.
- 5.6 The contractor shall issue repair/maintenance reports for the work and maintain any records as required by BHEL, for better maintenance of Cranes.

VI. Scope of Supply & Responsibility of BHEL

- 6.1 All types of spares of Mechanical, Electrical, Electronics, Structural, Consumable, Welding / Cutting set with consumables electrodes, gas facility shall be rendered by BHEL free of cost.
- 6.2 All types of specialized tools, tackles, and Load blocks shall be provided by BHEL.
- 6.3 Engineer of Crane section would monitor, control & facilitate contractor for smooth functioning of overall activities of breakdown & preventive maintenance activity.
- 6.4 Material handling equipment like BOT/ Mobile Crane, Truck to the extent of their availability shall be provided to your crew for material movement.
- 6.5 Radio remote Controls, VFD, PLC, Load cell maintenance are not covered under the purview of this contract.
- 6.6 Proper place of sitting & working place equipped with internal Auto telephone facility shall be provided by BHEL at location centers.
- 6.7 All other work not specified above but essentially required for maintenance of EOT / JIB Cranes shall be covered in the Contract.