

## ANNEXURE - IV

### SCOPE OF WORK

#### 1. OBJECTIVE:

The objective is to outsource the maintenance and related activities of EOT Cranes, Gantry and Semi-Gantry Cranes in 01, 06, 51 Blocks and FR9FA area and 12 Stores Plate yard of BHEL Ramachandrapuram factory. This document defines the detailed scope of work.

#### 2. Scope of work:

##### A. Breakdown Maintenance

Breakdown Maintenance of all components of EOT Cranes, Gantry and Semi-Gantry Cranes mentioned in the document M&S/Cranes/Terms/Outsource and List of Cranes enclosed.

#### **MECHANICAL:**

1. General checking of the Crane.
2. Topping oil in the gear boxes.
3. Checking lubrication of crane.
4. Lubrication of wire ropes.
5. Replacement of LT/CT wheels including bearings, wheel shafts, couplings, pedestals, gears, etc.
6. 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.
7. Wire Ropes - Replacement of worn out/broken/crushed/damaged wire ropes, arranging for wire rope clamps.
8. Hook block of hoists - Replacement of damaged / worn out hooks.  
Replacement of damaged / defective pulleys and any other damaged components of the hook blocks.
9. Checking and replacement of crane end stoppers on LT and CT motion.
10. Restoration of trolleys at the time of derailment.
11. Checking and repairing bogie system on end carriages and repairing damages to structures.
12. Checking and replacement of brake units / brake liners, replacement of springs, adjustment of studs etc.

#### **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, Pendent, etc.
21. Repair / Replacement of cable trolleys.
22. Repairs / Replacement of floor operation push button pendent 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.

#### **ELECTRONICS:**

27. Checking of Radio Remote Control System.
28. Minor repair / Replacement of remote control transmitter and receiver
29. Replacement of PCB or push buttons of RRC in case of faults.
30. Replacement / Adjustment / Tuning of variable frequency drives (VVVF).

#### **CLEANING OF CRANES:**

31. All cranes to be cleaned 3 times in a year at regular intervals to remove any kind of waste materials / dust / oils / grease, unused cables, etc.

#### **B. PREVENTIVE MAINTENANCE:**

32. Preventive maintenance of all EOT cranes mentioned in the document M&S/Cranes/Terms/Outsource at periodicity indicated by BHEL.

#### **DOWN SHOP LEADS MAINTENANCE:**

33. Cleaning of DSL lines.
34. Tightening of Porcelain insulators and replacement.
35. Replacing / checking of current collectors.
36. Alignment of DSL lines.
37. Checking of power supply connections and DSL lines (Power feeding).
38. Repair / Replacement of power cables for DSL lines.

#### **GANTRY MAINTENANCE:**

39. Tightening of bolts on both sides of the gantry rail.
40. Replacement of bolts and washers wherever missing.
41. Filling rail gaps by welding or keeping suitable rail pieces and grinding properly after welding.
42. Replacement of rail pieces / re-alignment wherever necessary with new material.
43. Checking of end stoppers and welding / bolting rectification.
44. Cleaning of gantry walkways for removal of any unused / waste material.
45. Keeping handrails provided on walkway platforms in good condition

## OTHER TERMS & CONDITIONS

The job requires the following skills

Engineers	Engineering degree with 1 year work experience in Machine Tools / Cranes maintenance or Diploma with 5 Year work experience in Machine Tools / Cranes maintenance or ITI with 10 year experience in Cranes maintenance – 1 No.
Supervisors	Diploma with 1 year work experience or ITI with 3 year work experience or with 5 year work experience in cranes maintenance – 2 Nos.
Filters & Electrician (Skilled Worker)	ITI with work experience or with 3 year work experience in Cranes maintenance – 8 + 5 i.e. 13 Nos.
Unskilled Workers / Helpers	4 Nos.

Documentary evidence in support of above to be provided with the offer.

- a) The contractor's personnel shall be available in the factory premises in first and second shift of all working days of BHEL, and in first shift of all Sundays.
- b) Sufficient staff shall be maintained by the contractor for undertaking the work. As responsible and competent supervisor shall be posted in each shift to coordinate and supervise the work in each shift.
- c) Emergency breakdown during the third shift of all working days and second shift of Sundays shall also be attended, for which skeleton staff shall be available in the factory premises.
- d) Total number of cranes (EOT, Gantry Semi-Gantry and Jib Cranes) is 126 Nos. the number of Cranes may vary by plus 10% and these should be covered automatically under the purview of this contract, without any increase in the price.
- e) The scope of work will include repairs of mechanical, electrical, radio remote control, drives, structural etc., items / components relevant to the cranes.
- f) The cranes shall be maintained at an average uptime not less than 98% of the total available time.
- g) A daily breakdown and monthly breakdown report (including downtime data of each crane) and report to major work shall be submitted to the In-charge of Cranes section after endorsement from concerned block maintenance In-charge.
- h) The contractor shall adhere to the priority fixed by the Block Maintenance / Cranes In-Charge for taking urgent repair work.
- i) Preventive Maintenance work of the cranes shall be done twice in a year as per the checklist provided by BHEL.
- j) The Cranes, DSL and gantry shall be periodically cleaned.
- k) As BHEL has been accorded with ISO-9001, ISO-14000 and OHSAS 18001 certification the contractor shall carry out qualitative work and environment friendly activities. Necessary documentation / paper work shall also be maintained.
- l) Contractor shall arrange his own tools for removal, dismantling, assembling and reinstallation of hoist/motors/gearboxes, etc. However, all spares including consumables like gear oil, dashpot oil, electrodes, grease, cotton waste, contactors, relays etc., and facilities like gas cutting, welding, machining facility, repair, rewinding of motors, coils etc., shall be provided by BHEL free of cost at ground level). However, the contractor to minimize the break-down time, shall adopt vigilant action for better parts / Methods voluntarily.

- m) Contractor shall maintain all records like breakdown forms, spares list, all other records pertaining of his work.
- n) For working at heights, Work Permit System shall be followed and record maintained.
- o) No foreign/used or unused/scrapped/broken parts shall be left on the crane/gantry/bridge so that likely accidents due to their falling are avoided.
- p) All used/worn out/scrapped/ replaced spares/ parts shall remain the property of BHEL.
- q) The contractor and their employees will observe all the laws/enactments, rules and regulations of BHEL and also the statutory and legal requirements of Central and State government.
- r) Utmost care should be taken by the contractor to repair the cranes in a proper way and with quality workmanship so as to adhere to the safety requirements as per the latest revision of AP Factories Act.
- s) All the contractor's personnel shall use PPE's (Personnel Protection Equipment).
- t) The contractor shall engage experienced personnel for the maintenance of cranes as per the job requirement as indicated at Sl. No. 2 above.
- u) The contractors shall furnish adherence point-wise to all points of these specifications otherwise offer shall not be considered.