

Government of India  
Bhabha Atomic Research Centre  
Reactor Design Development Group  
Reactivity Control Mechanism Section

Ref: RDDG/RCM/AMC/ enq/226

Date: 27/11 /2018

1. M/S Sidharth Engineering Company, Unit no. 109, Daulat Udyog Bhavan Wadavali, Chembur-Mumbai 400074
2. M/S High-Tech Servises, Unit no. 119, Daulat Udyog Bhavan, Wadavali, Chembur, Mumbai-400074
3. M/S MEHTA ENTERPRISES,77-C,Govind Niwas,Ground Floor,Ranade Road Extn,Dadar west,Mumbai-28
4. M/S Antoson Electricals,115, Shanti Ind Estate,S.N.Road,Mulund (W),Mumbai-80

**Sub:** Annual Maintenance of 1.5T Under slung crane along with load testing at RCM workshop, RCnD Complex for one Year ( Jan 2019-Dec 2019)

Dear Sir,

Quotations are invited for annual maintenance of under slung Crane and its maintenance platform of RCM workshop in RCnD complex as per specifications given in Annexure. Tender specifications are also including Load testing of the crane along with the transportation of load. You may kindly send your offer for the same. The last date for submission of sealed quotation is **07/12/2018 (due date) up to 1700 Hrs.** All quotations received against this enquiry before and on the due date shall be opened on next working day.

While quoting please note that:

1. Your offer shall be valid for minimum 45 days from the date of opening.
2. The quotation must reach to the Head, Head, Reactivity Control Mechanism Section,RDDG,BARC by the due date and must be sent in a sealed envelope superscribed with the reference number and the due date given above. The address on the envelope should read:  
**Head, Reactivity Control Section, RDDG  
RcnD Building, BARC, Trombay, Mumbai - 400 085.**
3. General terms and conditions of contracts are enclosed as annexure-I and tender specifications are enclosed as annexure-II.
4. The time allowed for completion of the work shall be for one year and same should be reckoned from 10<sup>th</sup> day after the date of issue of the work order.
5. Head,Reactivity Control Mechanism Section,RDDG,BARC reserves the right to accept or reject any or all quotations without assigning any reason.
6. Incomplete offer(s) or offer(s) received after the due date shall not be considered.
7. PAN no. /Tax No. is mandatory with offer.

**Encl.:** Annexure-I and II.

Head, RCMS, RDDG

## **Annexure-I**

### **Terms & Conditions**

1. Service Charges: Service Charges accepted shall be firm during the currency of the Contract.
2. Option:
  - a) While the contract is intended to be valid for a period of one year, this Division reserves the right to terminate this contract by giving a notice of one month and without any financial obligation on the part of this Division. In the event of cancellation of the contract for a reason or the other the payment for service carried out will be paid on pro-rata basis.
  - b) Proportionate amount shall be deducted from AMC charges for non-servicing period.
3. Emergency Call: Emergency/Breakdown call from the user department should be attended immediately but not later than 24 hours at no extra cost.
4. Scope of work:
  - a) Thorough cleaning, lubrication, testing, re-adjusting, replacement of parts needed for proper operation.
  - b) To repair defects during the currency of the contract.
  - c) To keep the equipment in up to date condition during the currency of the contract.
5. Replacement of spare parts: The cost of the spare part replaced during the currency of the contract will be paid extra at actual. However, the parts may be replaced with approval of user department regarding the reasonableness of cost and necessity of replacement. Request for a list of common spares needed for proper working may please be intimated to user department to enable them to stock the same.
6. Payment:
  - a) 50% payment shall be made after 6 months of repair/maintenance and on production of bill and advance stamped receipt. Final and remaining 50% payment shall be made after satisfactorily completion of work order.
  - b) Supplier has to forward your pro-forma invoice in triplicate indicating the service contract number and date, for arranging payment.
  - c) 100% payment for spares will be released (after due approval) on receipt of bill duly certified by the user department indicating the spares have been actually replaced and rates are reasonable.
7. Bills:
  - a) Bill and cash receipts for payment may be forwarded to the undersigned indicating our contract number for record.
  - b) Bill for spares replaced during the service contract period may please be forwarded to Head of the Division, BARC duly certified by the user department that the spares have been actually replaced and cost is reasonable.
8. Completion Report: A completion report may please be forwarded to this Office with copy to the user department after completion of the last servicing but well before the expiry of the contract certifying that the equipment have been serviced as per the terms and conditions of the contract and also with your proposal for extension of the contract if any, indicating our contract No. and date for our consideration.
9. Please ensure that our service contract number is quoted in all correspondences and bills etc.
10. Kindly acknowledge receipt and confirm that the servicing repair will be carried out in terms of the contract.
11. Income Tax, Surcharges and Edu. Cess as applicable will be deducted from the bills.

## **Confidentiality Clause:**

- I. Confidentiality: No party shall disclose any information to any third party concerning the matters under this contract generally. In particular, any information identified as “Proprietary” in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.

This clause shall apply to the sub-contractors, adviser or the employees engaged by a party with equal force.

- II. “Restricted information” categories under Section-19 of the Atomic Energy Act, 1962 and “Official Secrets” under Section-5 of the Official Secrets Act, 1923: Any contravention of the above-mentioned provision by any contractor, sub-contractor, consultant, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.
- III. Prohibition against use of BARC’s name without permission for publicity purposes: The contractor, sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC’s name for any publicity purpose through any public media like Press, Radio, TV or Internet without the prior written approval of BARC.

Head,RCMS,RDDG  
For and on behalf of The President of India

## **Annexure- II** **Technical Specification**

### **Specification of “Annual / Breakdown Maintenance of Under slung 1.5T Crane and its maintenance platform at RCnD building Complex”**

#### **Scope of work:**

The tender specifications deals with job description for the “Annual Maintenance and load testing of 1.5T Under slung crane and it’s maintenance platform of RCM Workshop in RCnD Complex.”

The crane is ‘SWIFT’ make and supplied by M/s Consolidated Hoists Pvt Ltd, Pune in 2002. Crane is in working condition at present. The scope of the work includes Mechanical/Electrical Repair/Maintenance with AMC.

#### **Job Requirement:**

- The Cranes shall be made functional for all the modes of its operation with smooth functioning of all the rotating parts.
- Final acceptance is subjected to load testing of the crane as per the standard procedure, in presence of our representative and certification of competent authority.
- After repair/maintenance, the crane should give trouble free operation.
- After repair/maintenance, the contractor shall do the periodic maintenance once in a month without any call from the department with their prior appointment with the undersigned. Emergency breakdown calls shall be attended without any extra cost as and when it occurs.
- Annual Load Test in the presence of the MHE representative.

#### **Job Description:**

- Mechanical/Electrical/Structural/Overhauling and maintenance. Painting of the cranes as and when required.
- Checking & servicing of electrical control circuit, relays, contactors, switches etc.
- Total job activity to be performed as per specification attached.
- Loads for the load testing shall be arranged, transported and assembled by the supplier.
- Carry out the load testing on time in the presence of the MHE representative.
- Supplier has to do the necessary rectification on the observation of MHE representative.
- Re-varnishing of the motor-windings if required.

## Maintenance Check-List

Sr. No.	Activity	Action /Remarks
<b>1.0</b>	<b>Long Travel (LT) Wheel Drive - Right:</b>	
1.1	Check all the fasteners of gear box, motor etc.	OK/ Tightened.
1.2	Check the oil level in the reduction gear box and make up.	OK/ Make up/ NA
1.3	Lubricate the wheel gear pinion.	OK/ Lubricated/ NA
1.4	Lubricate the wheel bearing.	OK/ Lubricated/ NA
1.5	Check the brake liners clean/ replace.	OK/ Cleaned/ Replaced/NA
1.6	Check and adjust the setting of the brake assembly bushes/ spiders etc.	OK/ Adjusted/ NA
1.7	Check/ Replace the coupling bolts and	OK/ Replaced/ NA
1.8	Lubricate the rear wheel bearing.	OK/ Lubricated/ NA
1.9	Check and lubricate motor bearing.	OK/ Lubricated/ NA
1.10	Check any other item, which is not specified above.	OK/Done/NA
<b>2.0</b>	<b>Long Travel (LT) Wheel Drive - Left:</b>	
2.1	Check all the fasteners of gear box, motor etc.	OK/ Tightened
2.2	Check the oil level in the reduction gear box and make up.	OK/ Make up/ NA
2.3	Lubricate the wheel gear pinion.	OK/ Lubricated/ NA
2.4	Lubricate the wheel bearing.	OK/ Lubricated/ NA
	Check the brake liners clean/ replace.	OK/ Cleaned/ Replaced/
2.6	Check and adjust the setting of the brake assembly.	OK/ Adjusted/ NA
2.7	Check/ Replace the coupling bolts and bushes/ spiders etc.	OK/ Replaced/ NA
2.8	Lubricate the rear wheel bearing.	OK/ Lubricated/ NA
2.9	Check and lubricate motor bearing.	OK/ Lubricated/ NA
2.10	Check any other item, which is not specified above.	OK/Done/NA
<b>3.0</b>	<b>Long Travel (LT) Single Drive:</b>	
3.1	Check all the fasteners of gear box, motor etc.	OK/ Tightened
3.2	Check and confirm that LT tram wheels are not going skewed.	OK/ Skewed
3.3	Lubricate the LT main line shaft bearing/ Right.	OK/ Lubricated/ NA
3.4	Lubricate the LT main line shaft bearing/ Left.	OK/ Lubricated/ NA
3.5	Lubricate the LT brake supporting system.	OK/ Lubricated/ NA
3.6	Check the brake liners clean/ replace.	OK/ Cleaned/ Replaced/
3.7	Check and adjust the setting of the brake	OK/ Adjusted/ NA assembly.
3.8	Lubricate the LT line shaft pinion.	OK/ Lubricated/ NA
3.9	Lubricate the LT line shaft gear ring.	OK/ Lubricated/ NA
3.10	Check/ Replace the LT shaft flexible coupling pins, rubber bushes, spiders etc	OK/ Replaced/ NA
3.11	Check & tighten LT shaft bearing housing fasteners.	OK/ Tightened/ NA
3.12	Check and lubricate motor bearing.	OK/ Lubricated/ NA
3.13	Check any other item which is not specified above.	OK/Done/NA
<b>4.0</b>	<b>Cross Level (CL):</b>	
4.1	Check all the fasteners of gear box, motor etc.	OK/ Tightened
4.2	Check/ Replace the oil of reduction gear box.	OK/ Made-up/ Replaced
4.3	Lubricate the CT wheel bearing front right.	OK/ Lubricated/ NA
4.4	Lubricate the CT wheel bearing front left	OK/ Lubricated/ NA
4.5	Lubricate the CT wheel bearing rear right.	OK/ Lubricated/ NA
4.6	Lubricate the CT wheel bearing rear left.	OK/ Lubricated/ NA
4.7	Check/ Replace the coupling, rubber bushing etc.	OK/ Replaced/ NA
4.8	Check the brake liners clean/ replace.	OK/ Cleaned/ Replaced/ NA
4.9	Check and adjust the setting of the brake assembly.	OK/ Adjusted/ NA
4.10	Check/ Adjust the clearance between wheel and rail.	OK/ Adjusted/ NA
4.11	Check any other item which is not specified above.	OK/Done/NA

<b>5.0</b>	<b>Hoist Drum:</b>	
5.1	Check/ Replace the oil of hoist gear box.	OK/ Made-up/ Replaced
5.2	Lubricate the hoist drum shaft (DE) bearing.	OK/ Done
5.3	Lubricate the hoist drum shaft (NDE) bearing.	OK/ Done
5.4	Lubricate the bottom sheave bearing right.	OK/ Done
5.5	Lubricate the bottom sheave bearing left.	OK/ Done
5.6	Check/ Lubricate the side wheel bearing.	OK/ Lubricated/ NA
5.7	Check the wire rope.	OK/ Done/ NA
5.8	Check the hoist rope for broken stands.	OK/ Damaged
5.9	Check the tightness of rope clamp bolts.	OK/ Tightened
5.10	Lubricate the wire rope.	OK/ Done
5.11	Check the load test for wire rope.	OK/ Done/ NA
5.12	Check the setting and adjust the Magnetic Hydro-Thruster Brakes.	OK/ Done/ NA
5.13	Check the setting and adjust the Brakes.	OK/ Done/ NA
5.14	Check/ Tighten all fastener of hoisting system.	OK/ Tightened
5.15	Check/ Replace the coupling bolts/ bushes.	OK/ Replaced
5.16	Check/ Lubricate hook thrust bearing.	OK/ Lubricated/ NA
5.17	Check the brake liners clean/ replace.	OK/ Clean/ Replaced/ NA
5.18	Check and adjust the setting of the brake.	OK/ Adjusted/ NA
5.19	Check and re-make the Thruster Oil Level.	OK/ Re-made
5.20	Check any other item which is not specified above.	OK/ Done/ NA
<b>6.0</b>	<b>Electrical:</b>	
6.1	Check all the power/ control cables are in good condition.	OK/ Damaged
6.2	Check/ Tighten all the terminals of power & control wire in control panel, resistance box etc.	OK/ Tightened
6.3	Check/ Tighten all the terminal of L.T main motor.	OK/ Tightened
6.4	Check/ Tighten all the terminal of L.T micro motor.	OK/ Tightened
6.5	Check/ Tighten all the terminal of C.T main motor.	OK/ Tightened
6.6	Check/ Tighten all the terminal of C.T micro motor.	OK/ Tightened
6.7	Check/ Tighten all the terminal of hoist main motor.	OK/ Tightened
6.8	Check/ Tighten all the terminal of hoist micro motor.	OK/ Tightened
6.9	Check/ Tighten all the terminal of auxiliary hoist main motor	OK/ Tightened
6.10	Check/ Tighten all the terminal of auxiliary hoist micro motor	OK/ Tightened
6.11	Check/ Tighten all the Hydro/ Magnetic brake motor/ coil terminals of L.T brake system.	OK/ Tightened
6.12	Check/ Tighten all the Hydro/ Magnetic brake Motor/ Coil terminals of C.T brake system.	OK/ Tightened
6.13	Check/ Tighten all the Hydro/ Magnetic brake motor/ coil terminals of hoist brake system	OK/ Tightened
6.14	Check/ Tighten terminals of L.T limit switches.	OK/ Tightened
6.15	Check/ Tighten terminals of C.T limit switches.	OK/ Tightened
6.16	Check/ Tighten terminals of hoist limit switches.	OK/ Tightened
6.17	Check/ Tighten the earthing fastener – 1st earthing.	OK/ Tightened
6.18	Check/ Tighten the earthing fastener – 2nd earthing.	OK/ Tightened
6.19	Check the hoist main/ micro motor for healthy earthing.	OK
6.20	Check/ Adjust all the overload range as per motor.	OK/ Adjusted
6.21	Check all the indication lamps are functioning properly.	OK
6.22	Check power on indication lamps are functioning properly	OK
6.23	Check the interlock between hoist main and micro motor.	OK
6.24	Check the interlock between forward and reverse motion of L.T.	OK
6.25	Check the interlock between forward and reverse motion of C.T.	OK

6.26	Check the interlock between forward and reverse motion between hoist up and down.	OK
6.27	Check the emergency off switches are working properly.	OK
6.28	Check any other item which is not specified above.	OK/Done/NA
6.29	Measure the IR values of all electrical components.	OK
<b>7.0</b>	<b>General (Structure):</b>	
7.1	Check supporting structure of gantry girder for its Healthiness.	OK/ Checked/ NA
7.2	Check/ Tighten the L.T travel rail fasteners.	OK/ Tightened
7.3	Check/ Tighten the C.T travel rail fasteners.	OK/ Tightened
7.4	Check the alignment and rigidity of the rails.	OK/ Rigid
7.5	Check the healthiness of end Stoppers	OK/ Good Condition.
7.6	Check/ Tighten all end carriage fasteners.	OK/ Tightened
7.7	Check/ Adjust the rail/ wheel clearance.	OK/ Adjusted
7.8	Check the functioning of horn.	OK/ Checked
7.9	Check the supporting structure for any cracks.	OK/ Damaged
7.10	Check/ Tighten the fasteners of L. T limit switch – Right.	OK/ Tightened
7.11	Check functioning of limit switch.	OK/ Adjusted
7.12	Check/ Tighten the fasteners of L.T limit switch – Left.	OK/ Tightened
7.13	Check functioning of limit switch.	OK/ Adjusted
7.14	Check/ Tighten the fasteners of C.T Limit Switch – Right.	OK/ Tightened
7.15	Check the functioning of limit switch – Right.	OK/ Adjusted
7.16	Check/ Tighten the fasteners of C.T limit switch – Left.	OK/ Tightened
7.17	Check the functioning of C.T limit switch – Left.	OK/ Adjusted
7.18	Check/ Adjust the Hoisting limit mechanism/ tighten fasteners.	OK/ Adjusted
7.19	Check/ Adjust the functioning of hoist top limit switch.	OK/ Adjusted
7.20	Check/ Adjust the functioning of hoist low limit switch.	OK/ Adjusted
7.21	Check/ Adjust the functioning of second limit switch if any.	OK/ Adjusted
7.22	Check any other item which is not specified above.	OK/Done/NA

**8.0 Any other item which is not specified above**

**9.0 General Remark:** \_\_\_\_\_

## **MAINTENANCE OF ELECTRICAL EQUIPMENT**

### **1. Motor**

*Periodically, motor insulation resistance is to be checked. If it is less than 2 mega ohm on 1000 V megger, parts should be cleaned and painted with insulation, varnished and rechecked for insulation. Terminal boxes should be checked for tightness and cleanliness. If slip rings become rough due to sparking they should be cleaned with fine glass paper or if they become very rough, a fine cut on lathe is to be taken. Brush springs must be checked for required pressure. When required pressure is not achieved by setting springs, brushes are not to be changed. Motors to be cleaned periodically with compressed air through blowers.*

### **2. Isolating Switches**

*Switches should be cleaned periodically by compressed air. Contacts should be lubricated periodically. Arc chambers should be checked up occasionally for burning of the quenching plates or of the side walls and should be replaced, if necessary.*

*All bolt connections must be retightened from time to time. Contacts should be checked occasionally and should be changed whenever required.*

### **3. Air Brake Contactors**

*Copper contacts should be cleaned with a smooth cut file and surfaces to be polished with glass paper. Cleaning should be done with care so as to remove least metal. Contact with silver tips should not be replaced even they are blackened. Contacts should be checked for correct pressure between fixed and moving contacts. Unstable operation of contractors cause welding effect. When the contact spring action becomes very poor, contacts should be changed. Arc chutes should be inspected occasionally and burnt ones should be replaced by new ones. Damaged coil should be replaced.*

### **4. Relays**

*Relays should be cleaned by means of bellows. Contacts should be checked occasionally and replaced if required. Damaged coils should be replaced.*

### **5. Brake Solenoid**

*When the solenoid works it should not chatter. The magnet faces must be clean. The temperature should not exceed 100°C. It should be checked that the insulation of the supply leads to solenoid is satisfactory between themselves and earth. All bolts and nuts must be checked that they are tightened to the full. The rod must move freely. In case of burnt out coils, they should be replaced.*

### **6. Resistance**

*The unit must be cleaned periodically with compressed air bellows. A periodical inspection of the resistance unit should be made to see that no wire or grid is broken and that no connection is loose.*

### **7. Controllers**

*In case of copper contacts, fusion and formation of metal drops on the contact surfaces should be prevented. The exceed of metal should be cleaned away with a file. Contact springs must be adjusted for worn out contacts. When the contacts have worn out excessively, they should be replaced. Silver tipped contacts of master controllers should not be filled in. They should be replaced whenever tips become excessively thin. Connections inside the controller should be checked to ensure proper operation. Ball operations must be inspected*

*and lubricated with grease of proper composition. Controllers should be regularly cleaned of dust and dirt.*

### **8. Limit Switches**

*In order to ensure a trouble-free operation it is necessary to open and examine the switch periodically. While examining the switch, following should be checked: -  
Two contacts are to be considered worn out, if their thickness has reduced to 0.5mm. Tightening of all contact joints, screws etc. reliability of operation of the reset mechanism.*

### **9. Current Collectors of Conductors**

*Insulators for conductor support and collectors should be inspected periodically and changed, whenever damaged or broken. The sliding surface of M.S. angles should be thoroughly cleaned to allow the collector shoe to slide smoothly. For carbon insert collectors, inserts are to be renewed, and then worn halfway through.*

## **GENERAL INSTRUCTION FOR CRANE OPERATION**

- 1. Operator should inspect all mechanism of crane before operation.*
- 2. Check for lubrication of ropes and mechanism, light sound signals and foreign objects on crane, which may fall on crane when it moves.*
- 3. "STOP" signals given by anybody during operation should be obeyed.*
- 4. Start and Stop of cranes should be done smoothly and more than two motions should not be operated at a time limit. Switches should not be used as a means of stopping the crane.*
- 5. Load should not exceed safe working load, while lifting, ropes should be vertical and load should be clear of any obstructions.*
- 6. When lifting maximum permitted weight it should be lifted first 100mm and checked that brake is holding load properly. In case Brake fails when load is suspended, hoisting mechanism should be operated so as load should not fall immediately and then crane is to be taken to safe place and load lowered.*
- 7. One crane used to push another crane is not at all permitted.*
- 8. If power supply is out "OFF" all handles and controllers should be brought to zero.*
- 9. It is strictly prohibited to climb from one crane to another crane.*
- 10. Do not use any overhead material handling equipment for handling personnel.*
- 11. Stand clear of all loads.*
- 12. Always "inches" the Hoist into the load.*

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