

Specifications and schedule for the proposed Annual Maintenance Contract

Name of work

Annual Maintenance Contract (non – comprehensive) without spares for maintenance of Low Conductivity Water (LCW) coolant plant mechanical equipment along with associated piping system, hardware and machineries in the LCW Plants of Indus Accelerator Complex (IAC) at RRCAT Indore.

1. Scope of work

The scope of the work includes regular preventive maintenance of LCW plant equipment like pumps, cooling tower, piping system and machineries as listed in para 3. The scope of the work also includes breakdown maintenance and shut down maintenance of LCW plant equipment. The preventive maintenance shall be carried out as per the procedure mentioned by OEM. The detailed procedure of OEM shall be provided by RRCAT.

The plant maintenance work is divided in two categories according to their availability as per following:

Category-1 & 2: It includes the machineries and equipment which are in operation with accelerator machines and can only be made available for the maintenance work during the Indus shutdown period. The maintenance work during the Indus shutdown period is required to be carried out on priority within the stipulated shutdown time period. Based on our experience, this maintenance work would require at least two semi-skilled workers and two skilled technicians (ITI Fitters) for approximately 40 working days in a year. Normally the Indus shutdowns carried out every alternate months in a year, including Saturdays, Sundays and national holidays. If, the shutdown period extends beyond four days, it shall be intimated to the contractor well in advance.

Category-3: It includes the routine preventive maintenance work which will be carried out on the regular basis at LCW plant site during the normal operation of LCW plant to ensure the healthy condition of standby machineries. As per our experience, in order to carry out the repair and modification work at least two semi-skilled workers and two skilled technicians (ITI Fitter) would be required mostly during the general shift / normal office working hours for a minimum of 200 working days. But, in the cases of any extraordinary work requirements, the support shall have to be provided even on Saturdays, Sundays and national holidays.

All Tools and tackles for maintenance work or breakdown-maintenance work shall be arranged by the contractor at their own cost. However, general hand tools in general sizes will be made available by RRCAT, such as open/closed spanners, hammer, screw driver, allen key, adjustable/pipe wrench, belt tension gauge, dial gauge and magnetic stand for carrying out the maintenance activities at site. It is the responsibility of the contractor's representative to collect the required general hand tools from RRCAT representative and return them after completion of the work. Meeting the requirement of any special or specific tools/ custom made tooling shall be in the scope of the contractor.

2. Contractor's qualification (Details/proof shall be attached in the bid)

- 2.1. Indus Accelerator Complex (IAC) is national facility which is operated in 24x7 mode. LCW plant provides cooling to accelerator subsystem equipment (i.e., process cooling) and are being operated uninterruptedly in round the clock operation mode. In order to ensure smooth operation of IAC machines in continuous mode, it is required to carry out preventive & breakdown maintenance of LCW plant equipment to achieve high operational reliability and attend maintenance calls within the stipulated time as mentioned in the specification (refer Annexure-4, "Standard Terms & Condition", para 3.iii). In order to meet this requirement, offers are invited from parties having a local office at Indore. Details (address, contact numbers, etc) of the local office shall be mentioned during bidding.
- 2.2. The contractor shall have experience in executing at least one contract of similar kind of work involving maintenance or fabrication & installation activities in scientific laboratory or industrial establishment and should have satisfactorily completed at least one work of Rs. 5 lakhs for any government agency/reputed private company in last three years.

- 2.3. RRCAT may ask bidder to provide details pertaining to the bid or to demonstrate his capability to execute the work (for which the contractor shall agree to provide required services within the stipulated time) or if required a pre bid meeting may be called for confirmation.
- 2.4. Contractor shall provide contact details of two persons (main & alternate) to be contacted for any information (name, address, phone, email, mobile).
- Important:** The contractor shall provide all required inputs and in case of not supplying information or sending ambiguous replies, it may lead to rejection of the bid. "

3. Scope of Work, Quantity of work, unit rates & cost breakup:

3.1. Scope of work under Category-1.

List of equipment / system along with the frequency of maintenance works and quantity that are to be carried out during proposed shutdown time period are mentioned in Table-1. The preventive maintenance works on pumps shall be carried out as per the procedure mentioned in pump OEM manual. The details of pump OEM manual will be provided by RRCAT. However the general works on pumps shall be checking & topping up lubrication, checking & correcting of alignment, loose foot, vibration level etc. and the general works on piping system shall be replacing of gaskets, PU tubes, passing valves, etc.

The contractor shall provide unit rate (refer column "B") and Total Amount (refer column "C") as indicated in Table:1

Table: 1

| SrNo | Description of Equipment and frequency of maintenance activity. | Qty for AMC (A) | Contractor's unit rate (B) | Total Amt in ₹ (C) = (A)x(B) |
|------|--|-----------------|----------------------------|------------------------------|
| i. | Location LCW Plant, Indus-1, Vertical in line SS multi stage centrifugal Primary Pumps with 22 kW & 30 kW Induction motor units. Frequency / year: 6 Times (2 pumps each Time) | 12 Nos | ₹ _____ / pump | |
| ii. | Location LCW Plant, Indus-2, Vertical in line SS multi stage centrifugal Primary Pumps with Induction motors of 55kW, 50kW & 30kW. Frequency / year: 6 Times (3 pumps each Time) | 18 Nos | ₹ _____ / pump | |
| iii. | Location Precision Cooling Systems 1 to 5 for LS-8 Indus-2 station. Process Pumping units of capacity: 200 lpm, 10 kg/cm ² , 5.5 kW. Frequency / year: 6 Times (1 pump each Time) | 6 Nos | ₹ _____ / pump | |
| iv. | Location Precision Cooling Systems 1 to 5 for LS-8 Indus-2 station. Secondary & Chilled Water Pumps, 200 lpm, 5 kg/cm ² , 37 kW. Frequency / year: 6 Times (2 pumps each Time) | 12 Nos | ₹ _____ / pump | |
| v. | Location Chiller Plant Building (CPB). Process Pump, 350 lpm, 10 kg/cm ² , 11 kW. Frequency / year: 2 Times (1 pump each Time) | 2 Nos | ₹ _____ / pump | |
| vi. | Precision Cooling Systems 6, 7 & 8 for LS-7 Indus-2 station, Process Pump, 150 lpm, 5 kg/cm ² , 7.5 kW. Frequency / year: 2 Times, (1 pump each Time) | 2 Nos | ₹ _____ / pump | |

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|-------|--|---------|-----------------------|---|
| vii. | Location Precision Cooling Systems 6, 7 & 8 for LS-7 Indus-2 station. Secondary & Primary Chiller Pumps, 1500 lpm, 5 kg/cm ² , 22 kW & 30 kW. Frequency / year: 4 Times, (1 pump each Time) | 4 Nos | ₹ _____ / pump | |
| viii. | Location Precision Cooling Systems 6, 7 & 8 for LS-7 Indus-2 station. Chiller loop Pump, 750 lpm, 5 kg/cm ² , 37 kW. Frequency / year: 2 Times, (1 pump each Time) | 2 Nos | ₹ _____ / pump | |
| ix. | Location Chiller Plant. Secondary Pump, 120 m ³ /h, 5 kg/cm ² , 30 kW. Frequency / year: 6 Times (1 pump each Time) | 6 Nos | ₹ _____ / pump | |
| x. | Location LCW Plant, Indus-1. Checking & replacing flange gaskets, PU tubes & SS tube. Flange sizes ranging from 15mm NB to 200mm NB & Tube sizes ranging from 8mm to 14mm. Frequency / year: 6 Times (80 joints each Time) | 480 Nos | ₹ _____ / Joint | |
| | | | Total Amount | ₹ |
| | | | Tax @ _____% | ₹ |
| | | | Total Amt. with taxes | ₹ |

3.2. Scope of work under Category-2.

List of equipment / system along with the frequency of maintenance works and quantity that are to be carried out during proposed shutdown time period are mentioned in Table-2. The preventive maintenance works on cooling tower (CT) shall be carried out as per the procedure mentioned in CT OEM manual. The details of CT OEM manual will be provided by RRCAT. However the general works on CT shall be checking & conditioning the sprinkler assembly, nozzles & float valve, belt drive, vibration level etc. and the general works on piping system shall be replacing of gaskets, PU tubes, passing valve, etc.

The contractor shall provide unit rate (refer column "B") and Total Amount (refer column "C") as indicated in Table:2

Table: 2

| SrNo | Description of Equipment and frequency of maintenance activity. | Qty for AMC (A) | Contractor's unit rate (B) | Total Amt in ₹ (C) = (A)x(B) |
|------|---|-----------------|----------------------------|------------------------------|
| i. | Location LCW Plant, Indus-1 & 2. Checking & replacing flange gaskets, PU tubes & SS tubes. Flange sizes ranging from 15mm NB to 200mm NB & Tube sizes ranging from 8mm to 14mm. Qty: 840 joints, Frequency / year: 1 Time | 840 Nos | ₹ _____ / Joint | |
| ii. | Location LCW Plant, Indus-1 & 2. Checking & conditioning the sprinkler assembly, nozzles & float valve. Checking & correcting the abnormal vibration in 7 CTs. Checking & correcting/replacing the motor belts & cooling tower fills. Dismantling & assembling of cooling tower motors, fans & gear box assembly. Cleaning & dusting of surface of cooling towers & its motor. Frequency / year: 1 Time | 7 Nos | ₹ _____ / CT | |

| | | | | |
|------|---|--------------------|--------------------------|---|
| iii. | Location LCW Plant, Indus-1 & 2. Cleaning & dusting of surface of piping system. Qty: 300 m ² , Frequency / year: 1 Time | 300 m ² | ₹ _____ / m ² | |
| | | | Total Amount | ₹ |
| | | | Tax @ _____% | ₹ |
| | | | Total Amt. with taxes | ₹ |

3.3. Scope of work under Category-3

The major activities to be carried out in Category-3 is as following:

Conditioning & testing of pumps along with motors as per OEM's defined procedure (provided by RRCAT). Checking & conditioning of primary pumps along with motors which are in continuous operation service during Indus shift operation. The work includes pumping systems related maintenance works like maintenance of mechanical seal, maintenance of pump & motor bearings, shaft alignment work, equipment & piping system installation works, piping system & equipment surface conditioning work as per the plant site requirement. The work also includes overhauling, conditioning, greasing, aligning, oil charging, cleaning of machineries, cooling towers, pumps & motors and up keeping of mechanical stores.

The contract also includes to assist in annual checking of spare / stock items in the mechanical store areas which are consisting of 20 mechanical racks, 6 Almiras in Ground floor and 5 mechanical racks in mezzanine floor. Material handling (5000 kg approx.) in mechanical stores and LCW plant sites as and when required. The work location, unit description and its frequency of works are as given in Table: 3.

The contractor shall provide unit rate (refer column "B") and Total Amount (refer column "C") as indicated in Table:3

Table: 3

| SrNo | Description of Equipment and frequency of maintenance activity. | Qty (A) | Contractor's unit rate (B) | Total Amt in ₹ (C) = (A)x(B) |
|------|---|---------|----------------------------|------------------------------|
| i. | Location LCW Plant, Indus-1. Secondary Pumps, 120m ³ /h, 5 kg/cm ² , 30 kW, Becan Weir make, horizontal split casing CI single stage centrifugal pump. Frequency / year: 2 Times (1 pump each Time) | 2 Nos | ₹ _____ / pump | |
| ii. | Location LCW Plant, Indus-1. Soft Water Make up Pumps, 2.2kW. Frequency / year: 2 Times (1 pump each Time) | 2 Nos | ₹ _____ / pump | |
| iii. | Location LCW Plant, Indus-2. Secondary Pumps, 37 kW, 45kW & 55kW. Frequency / year: 5 Times (1 pump each Times) | 5 Nos | ₹ _____ / pump | |
| iv. | Location LCW Plant, Indus-2. Soft Water Make up Pumps, 1.1 kW. Frequency / year: 2 Times (1 pump each Times) | 2 Nos | ₹ _____ / pump | |
| v. | Location LCW Plant, Indus-2. Raw Water Make up Pumps, 2.2 kW. Frequency / year: 2 Times (1 pump each Times) | 2 Nos | ₹ _____ / pump | |
| vi. | Location LCW Plant, Indus-1. Polishing Pumps 1.1kW. Frequency / year: 6 Times (1 pump each Time) | 6 Nos | ₹ _____ / pump | |
| vii. | Location LCW Plant, Indus-2. Polishing Pumps, 0.75kW. Frequency / year: 6 Times (1 pump each Time) | 6 Nos | ₹ _____ / pump | |

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|-----------------------|---|-------------------------|---------------------|--|
| viii. | Location LCW Plant, Indus-1 & 2. Cutting, fitting, fabrication & erection of SS, GI & MS pipe & pipe fittings. Sizes ranging from 15mm NB to 200mm NB. Frequency / year: 12 Times (20 Joints each Time) | 240 Nos of joints | ₹ _____/ Joint | |
| ix. | Location LCW Plant, Indus-1 & 2. Cutting, fitting, fabrication, erection & painting of SS & MS structural. Frequency / year: 12 Times (100 kg each Time) | 1200 kg | ₹ _____/ kg | |
| x. | Location Machine Shop, Indus-2. One Lathe Machine, Make: Kirloskar, Model: Turn Master – 50, Motor: 75kW. Frequency / year: 1 Time | 1 No | ₹ _____/ machine | |
| xi. | Location Machine Shop, Indus-2. One Radial Drilling Machine, Make: Comet, Model: SRD25B, Motor: 0.75hp. Frequency / year: 1 Time | 1 No | ₹ _____/ machine | |
| xii. | Location Machine Shop, Indus-2. One Drilling cum Milling Machine, Make: RHNO, Motor: 0.75hp. Frequency / year: 1 Time | 1 No | ₹ _____/ machine | |
| xiii. | Location Machine Shop, Indus-2. Two Tool Grinders, Model: TE-6-E, Motor: 0.25 hp. Frequency / year: 1 Time | 2 Nos | ₹ _____/ machine | |
| xiv. | Location Machine Shop, Indus-2. One Power Saw, Make: Djawal Machine Tools, Model: 14, Motor: Frequency / year: 1 Time | 1 No | ₹ _____/ machine | |
| xv. | Location Indus LCW plant Mechanical stores & plant area (Indus-1 & 2) housekeeping. Frequency / year: 10 Times (500 kg each Time) | 5000 kg | ₹ _____/ kg | |
| Total Amount | | | ₹ | |
| Tax @ _____% | | | ₹ | |
| Total Amt. with taxes | | | ₹ | |

4. Acceptance Criteria

| Sr.No. | Equipment / Activity | Acceptance criteria |
|--------|--|--|
| 1. | Pump | Trouble free operation of each pumps at their normal operating parameter. |
| 2. | Cooling tower (CT) | Trouble free operation of each CTs at their normal operating parameter. |
| 3. | Machine shop equipment like lathe, drilling machine, drilling cum milling machine etc. | Trouble free operation of each machine at their normal operating parameter. |
| 4. | All Piping system associated equipment & system of LCW plant including welding of pipe joints. | a) Welding of joints: visual & DPT (as per ASME-sec XI) b) Hydraulic testing at 1.2 times the system operating pressure and zero leak at operating parameter. |

5. Compliance Sheet: The supplier shall fill and furnish the details in attached compliance sheet

Compliance Sheet

| SlNo | Parameters | Tender Value | Bidder's Values / Confirmation |
|------|--|--|---|
| 1. | Contractor's qualification (attach supporting valid documents) | a) Details (address, contact numbers, etc) of the local office as mentioned in technical specification para 2.1 of Annuxure-3A | Give details in bid (in separate sheet) |
| | | b) Should have satisfactorily executed at least one contract of Rs. 5 lakhs for any government agency/reputed private company in last three years involving maintenance or fabrication & installation activities as mentioned in technical specification para 2.2 of Annuxure-3A. Genuine Certificate with all details shall be enclosed with offer. | Attach valid documents |
| 2. | Standard Terms and Conditions | Fully agree to all the points mentioned in Standard Terms and Conditions as per Annuxure-4 | Give Confirmation |
| 3. | Specifications and schedule for Annual Maintenance Contract | Fully agree with specifications and schedule for Annual Maintenance Contract as mentioned in annuxure-3A | Give Confirmation |
| 4. | Table -1 as mentioned in Annexure – 3A | Duly filled, signed with seal and attached with the bid. | Give Confirmation |
| 5. | Table -2 as mentioned in Annexure – 3A | Duly filled, signed with seal and attached with the bid. | Give Confirmation |
| 6. | Table -3 as mentioned in Annexure – 3A | Duly filled, signed with seal and attached with the bid. | Give Confirmation |

Bidder Signature & Seal

Note: Compliance Sheet should be filled & duly signed & stamped in separate sheet as per the above format. Incomplete compliance sheet shall be treated as invalid offer and shall be rejected without any further correspondence.