

E.C.I.L (P.O)
HYDERABAD-500062

web: www.nucfuel.gov.in



FAX 040-27121271

Tel No 040 27184518

040-27184470

e-mail: shl@nfc.gov.in

tanmay@nfc.gov.in

**GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
NUCLEAR FUEL COMPLEX
Maintenance - Zirconium Group**

NOTICE INVITING TENDER

Tender No. : NFC/MZG(09)/PPM/2018/12

Date: 18 -03-2019

To

M/s. _____

Dear Sir,

On behalf of the President of India, sealed item rated tenders are invited from competent and well experienced contractors for the following work on works contract basis.

- 1. Name of Work** : Preventive Maintenance and minor repair works of MZG equipments
- 2. Scope** :As per Annexure–II.
- 3. Duration of Contract** : 12 months
Further it may be extended for next 12 months without any escalation in price considering the performance and workmanship of contractor and his team members with mutual consent.
- 4. Estimated cost** : **Rs. 25,50,000/-** (You can also refer clause No. 16 of terms & conditions)
- 5. Earnest Money Deposit** : Rs 51,000/- (Rupees Fifty one thousand only)

EMD shall be submitted in the form of Fixed Deposit Receipt/Crossed Demand Draft drawn in favor of 'Pay and Accounts officer, NFC' payable at Hyderabad. Offers without EMD will be summarily rejected.

Name and A/C No. of the contractor may be written at the back side of DD submitted towards EMD.

- 6. Issue of tender document** : **From 25-03-2019 to 24-04-2019**
- 7. Last date for submission of tender** : **On 30-04-2019 up to 14.00 hours**
- 8. Date of opening the sealed tenders** : **On 30-04-2019 at 14.30 hours**
- 9. Cost of tender document** : Rs. 500/- (Demand draft or banker's cheque payable at Hyderabad drawn in favor of "Pay & Accounts Officer, NFC")

Quotations are to be submitted strictly in the format enclosed. Tender and EMD shall be placed in two separate envelopes clearly indicating tender No. and each marked as TENDER & EMD respectively.

Ref: Tender No. NFC/MZG(09)/PPM/2018/12

Both the envelopes shall be submitted together in another sealed envelope superscribing Tender No. & Description of work along with due date and time of submission on the outer cover.

Your offers shall be deposited in tender box kept for the purpose at the office of Senior Manager, MZG, Nuclear Fuel Complex, ECIL Post, Hyderabad – 500062, **up to 14.00 hours on 30-04-2019.**

Tenders will be opened at Works Section, III floor, Aadhar Building, NFC. Late/delayed tenders & tenders not accompanied by EMD shall not be considered.

Tender document issued to the contractor is non transferable.

Senior Manager
Maintenance Zirconium Group
For & on behalf of the President of India

Note: NFC is committed to a corruption free work environment. All the purchase and contract commitments of NFC will be honoured without the citizen having to pay any bribe. In case any person demands any bribe, it is the duty of a responsible citizen to inform the matter to the Vigilance Officer, NFC, Hyderabad. Telephone No. 040-27122181 & 040-27184314 (Office) and 040-27137012 (Residence). [Email: vo@nfc.gov.in](mailto:vo@nfc.gov.in)

Terms and Conditions of NIT No. NFC/MZG(09)/PPM/2018/12

Eligibility criteria for issue of tender:

- 1) Tenders will be issued only to eligible contractors provided they produce definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority of having satisfactorily completed similar works in the last seven years ending on the last day of month previous to the one in which the tenders are invited and of magnitude specified below:
 - a) Criteria of eligibility for issue of tender documents
 - i) One similar work not less than 80% of estimated cost
 - ii) Two similar works each not less than 60% of estimated cost
 - iii) Three similar works each not less than 40% of estimated cost
 - b) For the purpose of this clause similar work means Maintenance of Industrial Equipment. List of works executed together with the certificate/testimonials (viz. work orders issued with detailed schedule of quantities and corresponding completion certificates) from clients in support of the works executed of the similar nature and magnitude during the past seven years.
 - c) Contractor shall submit solvency certificate from any schedule bank of financial standing taken within one year and value not less than 40% of estimated cost unless otherwise indicated in the NIT.
 - d) Contractor shall submit audited balance sheets indicating value of works carried out/in progress, loss/profit for last 5 years.
 - e) Contractor shall submit technical establishment profile of the company with details like No. of technical people, workman and equipment/machinery, etc., available with the company.
 - f) Contractor has to take appropriate ESI & EPF for the engaged labors.
 - g) GST Registration certificate shall be submitted.

Eligibility Criteria for Manpower:

- 2) The contractor shall be completely responsible for the maintenance work. The contractor shall deploy required man power as stipulated in Annexure-II for execution of the works which involves **overhead jobs** also.
 - a) The requirement of manpower is as under
 - i) ITI qualified and experienced Electricians capable of doing maintenance/PM and repair works of electrical machines, circuits and panels (4+ years experienced - skilled).
 - ii) ITI qualified and experienced Electronics/Instrument/Electrical mechanics capable of doing maintenance and repair works of instruments/systems and panels (4+ years experienced - skilled).
 - iii) Electrical supervisor shall be a Diploma holder in Electrical Engg. with four+ years maintenance experience or an ITI holder with 10+ years maintenance experience capable of executing electrical maintenance and repair works as mentioned in the scope. And he shall fully be responsible for carrying out the works properly & safely.
 - b) Certificates with respect to experience and educational qualifications of the personnel and the supervisor shall be submitted along with the offer.
 - c) The contractor shall authorize the supervisors for safe execution of the assigned jobs. Undertaking for the same shall be furnished by the contractor in writing.
- 3) Contractor will be completely responsible for the job and shall deploy qualified manpower along with required tools & tackles. All the tools & tackles brought in by the contractor shall be test verified by Departmental personnel periodically (quarterly).

Safety Guidelines

- 4) The contractor shall be responsible for supervision of work/people. He has to ensure safe working practices and use of necessary Personal Protective Equipments (PPE) by the workers which will be provided by him (contractor).

- 5) The workers engaged by the contractor should wear uniform which is distinct from NFC uniform. Safety shoes and other PPE as required by the job are to be provided by the contractor for all the workers engaged by him and ensure its usage. The contractor has to ensure safe working practices and follow all safety rules and regulations stipulated by SED, NFC from time to time. The contractor shall also give an undertaking that he shall bear all the expenses towards medical treatment in case of any accident to his personal while working.
- 6) Valid Medical fitness certificate from at least an MBBS doctor shall be submitted for the workers engaged by the contractor. He shall also submit height passes or any other documents as required by NFC.

Labour Guidelines

- 7) The Contractor must follow all Labor Laws such as Contractor (Regulation & Abolition Act), Minimum Wages, Payment of Wages Act, EPF & MP Act, ESI Act, Payment of Bonus Act, Employees Compensation Act etc. NFC reserves the right to ask the Contractor to furnish proofs/documentary evidence for following the above laws.
- 8) Wages are to be paid as per Minimum Wages Act, circulated by RLC (C) from time to time. Contractor have to follow and revise/update minimum wages of his employees as per the circular issued by Chief Labour Commissioner, Ministry of Labour & Employment, New Delhi from time to time during the period of contract i.e. 12 months. If Contractor needs any clarification regarding provisions in above laws, he/she may directly contact Welfare Officer, NFC, Hyd, for such clarifications. He may be contacted on 040-27183059 or wo@nfc.gov.in on any working day during office hours. Such clarifications shall be sought before quoting; ESI & EPF coverage shall be made compulsory for all the contract laborers engaged. Certificate from Officer-in-Charge at NFC regarding payment of minimum wages to the contract labour is to be enclosed along with the claim.
- 9) The employees of the contractor are required to produce police verification certificate, medical certificates, height passes or any other documents as required by the security of NFC.
- 10) No child labor (Below 18 Years old) should be engaged. Age of outsourced persons engaged for the work should be restricted to 50 years.
- 11) Contract labour is to be engaged in General Shift only.
- 12) The contractor shall ensure that labour deployed for the contract would confine themselves to their respective places of work and not indulge in activities that would be harmful to NFC.
- 13) NFC reserves right to ask the contractor for replacement of any of their workman for any reason such as unruly behavior, lack of integrity or lack of workmanship. Further NFC reserves its right to cancel the contract if the overall performance is not satisfactory even after replacement of few workmen.
- 14) The detailed description of work given in Annexure-II is in detail and quite extensive. But it is not explicit. Hence, the contractor is obliged to carry out any other minor work which is required to fulfill the objective of the work order without addition of cost.

Commercial Terms

- 15) Earnest Money Deposit at the rate of 2% of estimated cost put to tender shall be submitted along with tender in the form of Fixed Deposit Receipt /crossed demand draft in favour of 'Pay and Accounts Officer, NFC' payable at Hyderabad. Offers without EMD will be summarily rejected.
- 16) The quoted value shall be exclusive of ESI, EPF and inclusive of GST. The payment towards ESI, EPF will be released against submission of documentary evidence towards payment of ESI, EPF to the concerned authorities.
- 17) The contractor shall provide the registration details of Income Tax ESI, EPF, GST, etc. while collecting tender document and copies of the same shall be submitted along with tender document.
- 18) Performance Guarantee @5% of Work Order value shall be submitted within 15 days from the date of issue of letter of acceptance or before the commencement of work, whichever is earlier, in the form of Fixed Deposit Receipt or Demand Draft or Bank Guarantee (In case Bank Guarantee is furnished, it shall be valid up to 15 months plus claim period of 6 months). Extension of time for submission of Performance guarantee at the request of the contractor shall be charged @ 0.1% per day of performance guarantee amount. If the performance guarantee is not submitted within the extended time, the EMD submitted shall be forfeited.

- 19) In case of non-submission of Performance Guarantee within prescribed/extended time, the Earnest Money Deposit submitted will be forfeited.
- 20) Security Deposit @ 2.5% of the Work Order Value shall be recovered from Running Account bills. The Security Deposit amount recovered shall be released after Three (3) months from the date of completion of entire work, or after payment of final bill, whichever is later.
- 21) Income tax and GST as applicable at source shall be deducted from the payments made. Non-submission of PAN or incorrect PAN No. attracts Income tax @20% on the gross bill. Contractor shall furnish his PAN No. and bank details along with a photocopy of the same, duly countersigned by him.
- 22) Payment for the work done by the contractor shall be made on pro-rata basis (after completion of every 3 months) based on the work done by the contractor which was accepted and measured by the Officer-in-charge, duly approved by Competent Authority.
- 23) Non-compliance of attendance of required manpower and safety guidelines will attract penalties as stipulated in penalty clause of the tender document.
- 24) Before quoting, the contractor may visit NFC for assessment of work with prior permission of Senior Manager, MZG. He may be contacted at 040 - 27184470/27183117. Email: shl@nfc.gov.in.
- 25) Contractor shall sign each page of the tender document along with the Schedule of quantities & Rates.
- 26) The offer should be kept valid for a period of three months from the date of opening of tender.
- 27) Incomplete and conditional tenders shall be rejected. However unconditional rebates are acceptable.
- 28) Contractors shall quote the rates both in words and figures.
- 29) In case there is variation between the rates in figures and words, the rate which corresponds to amount worked out by the contractor shall be taken as correct.
- 30) When the amount of an item is not worked out by the contractor, or if it does not correspond with the rates written either in figures or in words, then the rate quoted by the contractor in words shall be taken as correct.
- 31) When the rate quoted by the contractor, in figures and in words tallies, but the amount is not worked out correctly, the rate quoted by the contractor shall be taken as correct and not the amount.
- 32) The quoted rates shall not be less than the minimum wage fixed / notified by the State Government - where the service is performed and shall include all statutory obligations. However bids without any element of cost over and above such minimum wage (or below it) shall be treated as 'Nil' price quotation and would be rejected. The contractor shall be liable for all kinds of dues payable in respect of all personnel provided under the contract and NFC shall not be liable for any dues for availing the services of the personnel. The contractor should ensure that persons to be deployed are not alcoholic, drug addicts and not indulge in any activity prejudicial to the interest of the NFC. The Contractor shall ensure to get the Police Verification for all the manpower deployed by them and the contractor should ensure that the manpower deputed should bear good moral character.
- 33) The contractor shall submit duly filled in Form-C, which is enclosed along with tender.
- 34) NFC reserves right to accept or reject any quotation, either completely or partly, without giving any reasons.
- 35) In case the contractor fails to commence the work specified in the tender document within the prescribed time schedule, then the Government shall without prejudice to any other right or remedy be at liberty to forfeit whole Performance Guarantee absolutely.
- 36) If on acceptance of the tender, owing to the circumstances, if the scope of the work remains altered, reduced or abandoned for any reason, NFC shall give a notice in writing to that effect to the contractor who shall act accordingly. Also, if the workmanship is not satisfactory, the contract shall be cancelled.
- 37) If the contractor fails to execute the work completely, then the Government shall without prejudice to any other right or remedy be at liberty to forfeit whole Security Deposit and Performance Bank Guarantee absolutely.

Ref: Tender No. NFC/MZG(09)/PPM/2018/12

From:

Annexure-I

Date:

To
The Senior Manager (MZG)
Nuclear Fuel Complex, ECIL (Po)
Hyderabad - 500 062.

QUOTATION

Sub: Works contract for outsourcing of Preventive Maintenance and minor repair works of MZG equipments

Ref: NFC/MZG(09)/PPM/2018/12 dt. _____.

Dear Sir,

In response to your notice inviting Tenders, we hereby submit our quotation for carrying out the following jobs:

SCHEDULE OF QUANTITIES, QUOTED RATES & AMOUNTS

Sl. No	Description of item	Quantity	Unit	Rates in Rs (in figures & words)	Amount In Rs (in figures & words)
A	Electrical Works				
1	Preventive maintenance and repairs of the following				
a	PDBs(as per the attached schedule)	100	Nos		
b	Control circuits and MCCs(as per the attached schedule)	16	Nos		
c	Lighting DBs (as per the attached schedule)	180	Nos		
d	Switch Boards metal clad sockets etc (as per the attached schedule)	800	Nos		
2	Preventive Maintenance Overhauling & Repair of following Motors (as per the attached schedule)				

a	Squirrel Cage motors (Up to and including 20 kW)	200	Nos		
b	Squirrel Cage motors (above 20 kW)	30	Nos		
c	Slip Ring motors (up to and including 10 kW)	6	Nos		
d	Slip Ring motors (above 10 kW)	16	Nos		
3	Maintenance and repair of fans exhaust fans and man coolers (as per the attached schedule)	200	Nos		
4	Power Cable Laying (as per the attached schedule)	1000	Mtr		
5	Maintenance and repair of HPMV lamps (as per the attached schedule)	100	Nos		
6	Maintenance and repair of fluorescent lamps (as per the attached schedule)	400	Nos		
7	Preventive Maintenance of Cranes as per attached schedules given for: ZSP 15/5 Ton EOT cranes - 1 No. ZSP 10/3 Ton EOT cranes - 1 No. ZSP 10 Ton EOT cranes - 1 No. ZSP 3 Ton EOT cranes - 1 No. D&WS 5T EOT cranes - 2 Nos. GS 5T EOT Crane - 1 No. Total no of cranes = 7 (Each crane to be attended once in every month) Total qty per year : 7 x 12 = 84	84	Nos		
8	Preventive Maintenance of Furnaces as per attached schedules given for: Reduction Furnaces - 7 Nos.	48	Nos		

	Distillation Furnace - 4 No. Coking Furnace - 1 No. (PM for each Furnace is to be attended once in every 3 month) Total qty per year : $12 \times 4 = 48$				
[A]	Total Amount for Electrical works (Rs)				
B	Instrumentation Works				
1	Dismantling Cleaning assembling & testing of On/Off Valves. No. of On/Off Valves = 50 (Each valve to be attended once in 6 months) Total qty per year : $50 \times 2 = 100$	100	Nos		
2	Removing Cleaning and mounting of Level Transmitters No. of Level Transmitters = 20 (Each Level Transmitter to be attended once in 6 months) Total qty per year : $20 \times 2 = 40$	40	Nos		
3	Cleaning and testing of Shutoff valves in NCF No. of Shutoff Valves = 4 (Each valve to be attended once in 6 months) Total qty per year : $4 \times 2 = 8$	8	Nos		
4	Preventive Maintenance of Control panels in Reduction Vacuum Distillation New Chlorination SMP and ZOP No. of Control panels = 20 (Each Control panel to be attended once in 6 months) Total qty per year : $20 \times 2 = 40$	40	Nos		
5	Cleaning and testing of Level switches No. of Level switches = 5 (Each Level switch to be attended once in 6 months) Total qty per year : $5 \times 2 = 10$	10	Nos		
6	Signal Cable & Control Cable Laying & Dressing works Total Qty per year : 1000 meters	1000	Mtr		
7	Removal/Dressing of signal & Control cables	200	Mtr		
8	Miscellaneous works: a) Cleaning & minor repair of Batteries for UPS units - 10 banks x monthly	120	Nos		

[B]	Total Amount for Instrumentation Works (Rs)	
	Grand total of cost for electrical & instrumentation works (Rs) [A+B]	
	GST	
	Total	
	(Rupees	only)

(Rupees _____ only).

Note: The above quoted price is exclusive of ESI, EPF and Inclusive of GST.

Thanking you,

Name : _____
PAN No. : _____
GST Registration Number: _____
Bank Account No. : _____
IFSC Code : _____
Name of the bank : _____
Name of branch : _____

Tender Document has been issued to
M/s. _____ On
receipt of Rs. _____/- (Vide DD No.
_____ dated _____)
towards cost of Tender Document.

Yours faithfully,

CONTRACTOR
(Sign with Seal)

DETAILED SCOPE OF WORK (Technical Specification)

Tender No: NFC/MZG(09)/PPM/2018/12

Name of the Work: Preventive Maintenance and minor repair works of MZG Equipments

General:

- 1) All checks, isolation(process / electrical), Calibration response checking of instruments and test runs shall be carried out in presence of Departmental personnel only.
- 2) Before commencement of work, all contract workmen will be appraised in various aspects of safety and procedures to be followed during respective works.
- 3) All General Tools like Tester, Screw Driver, Pliers, Spanner, Hammer etc. required for the job shall be arranged by the contractor.
- 4) All Spares and consumables shall be supplied by Department.
- 5) Special Tools like Cable crimping tool, Welding Machine, Calibrator, Multi-meters, Tongue-Testers etc. will be supplied by NFC.
- 6) Preventive Maintenance Procedure:
 - a) PM checklist shall be issued on daily basis by Maintenance official after ensuring clearance and requisite isolation.
 - b) Contract personnel also shall ensure power and process isolation before commencement of work.
 - c) PPM work shall be carried out as per the Job Card / Checklist duly checking, measuring & recording required parameters.
 - d) The PPM shall be witnessed by Maintenance & Plant personnel and their signature shall be obtained on the Job Card.
 - e) If any test / trial run of the machinery is required while carrying out PPM, same shall be carried out by Maintenance Official.
 - f) Spares / Consumables shall be used as issued in consultation with Maintenance Official.
 - g) After completion of work from (a) to (f), men and material shall be cleared from the site along with completed job cards.
 - h) Empty cans, oil soaked cotton rags & wastes shall be deposited at designated places.
 - i) Replaced defective spare components shall be placed in identified locations only.

A. ELECTRICAL:

Scope of Work : To carry out Preventive maintenance and minor repair works of LT PDBs, MCCs Lighting DBs, Switch boards and Metal clad Sockets. Preventive maintenance and repair works of Resistive Furnaces, EOT Cranes, Overhauling & repair of AC Squirrel Cage & Slip-ring induction motors, maintenance and repair & replacement of high bay lamps and fluorescent lamps, fans, exhaust fans and man coolers. Cable laying and termination as and when required. Detailed scope of work for each item is given below.

1(a) & (b): Preventive Maintenance and repairs of Power Distribution Boards & MCCs:

Sl. No.	Checklist
1	Before de-energizing the PDB/MCC observe the voltmeter/Ammeter/Multifunction meter for proper functioning and calibration and take corrective action if required.
2	Check with series test lamp unit and ensure that the outgoing terminals are not live. Display "Danger 415V, DO NOT OPERATE MEN AT WORK" caution notice board at the corresponding outgoing switch of the PDB.
3	Observe the MCC for any contactor chattering and identify the contactor for specific attention.
4	Ensure isolation of the PDB/MCC from the upstream breaker in consultation with the maintenance official and immediately check for any overheat on the body of the MCC/PDB preferably by a thermal camera or by hand to identify the hot spot and its source.
5	Look for indications of over heating, arcing or insulation failure. Replace the defective parts if necessary.
6	Wipe off bus insulators with dry cloth and remove the accumulated dust preferably with a vacuum cleaner.
	Check the cable conditions for incoming and outgoing feeders and tightness of the following.
	1.Bus connections
	2.Power cable connections
7	3.Control wire connections
8	Check wiring for any insulation failure and cuts. Replace if necessary.
9	Check continuity of earthing wire/strip at MCC/PDB
10	In case of draw-out modules, check the stab-on-contacts and the mating bus for wear of plating meant for protection from environment. Replace if necessary.
11	Check the operating handles of all switches of the MCC/PDB for proper operation and mechanical interlock.
12	Check and replace defective indication lamps.
13	For MCCs
	a) Inspect the contactor contacts for any pitting and replace both fixed and moving contacts if necessary. Do not try to dress the eroded contacts.
	b) Check arc chutes.
	c) Check the condition of the cable lugs and terminals at the contactor.
	d) Check coil condition.
	e) Check condition of return spring, leaf spring, contact spring, shading springs.
	f) Check push button, emergency push button operating condition
14	Check for the integrity of connections at CT terminals. Tighten if required.
15	Check and ensure same rating of HRC fuses. Replace the fuses if required only with the same type and rating.
16	Lubricate the contacts of contactors and draw out module stabs with electrical lubricant.

17	Check and ensure the setting of the overload devices to match the motor rating.
18	Check all components of the MCC/PDB for missing/broken components, proper spring tension, free movement, rusting or corrosion, dirt and excessive wear. Take corrective steps if necessary.
19	Look for any moisture or signs of wetness inside MCC/PDB. Check for any openings, bare holes and cracks and seal them if found..
20	Check insulation resistance (IR valve).
21	Ensure availability of rubber mat of required size and voltage grade conforming to IS:15652 ,in front of MCC/PDB.

1(c) Preventive maintenance and repairs of Lighting DBs:

Sl.No.	Checklist
1	Identify the PDB from where the incoming supply to the LDB panel is given breaker in consultation with the maintenance official.
2	Switch off the corresponding outgoing feeder of the PDB breaker in consultation with the maintenance official.
3	Remove fuses from the switch.
4	Check with series test lamp unit and ensure that the outgoing terminals are not live. Display "Danger 415V, DO NOT OPERATE MEN AT WORK" caution notice board at the corresponding outgoing switch of the PDB.
5	Remove all the covers of the Lighting DB and carryout cleaning.
6	Check all the bus bar connections, cable terminations for proper tightness.
7	Check for any overheating of the cable and rectify the same.
8	Check all the handles of Lighting DB for proper position with marking. rectify the same if required.
9	Remove all unwanted material screws ,washers from the panel.
10	Check for any unwanted holes exists in the panel. Close them properly to avoid rats and lizards entering.
11	Check for proper labeling of incoming and all outgoing feeders. Label properly as and where required.
12	Fix all the covers for Lighting DB properly . See that all the screws are fixed properly, ensure all material, tools removed from the panel.
13	Switch on the power supply breaker in consultation with the maintenance official. Switch on all the feeders which were on before maintenance work is started breaker in consultation with the maintenance official.
14	Carryout the repairs of the lighting DBs including changing MCBs, cables, rectification for any loose contacts, overheated terminals, etc as and when required in coordination with NFC personnel. Also testing of the removed components, new switchgear and wiring in the DBs is to be carried out as and when required.

1(d) Preventive maintenance and minor repairs of switches and metal clad sockets:

Sl.No.	Checklist
1	Identify the LDB/ PDB from where the incoming to the switch/socket is given breaker

	in consultation with the maintenance official. Switch off the supply, remove fuses from the LDB/PDB.
2	Display "DO NOT OPERATE MEN AT WORK" board at the PDB/LDB.
3	Blow out the dust on the switch and socket using blower.
4	Remove the switch board covers
5	Ensure zero voltage at the incoming terminals with series test lamp unit.
6	Check the cables/wires and switches for any loose connections.
7	Make a note of the abnormalities and rectify the same.
8	Replace the switches, sockets, plug tops, MCBs etc if found damaged.
9	Check the cable gland for proper fixing.
10	Check for the proper earthing of the switch board.
11	Provide double earthing.
12	Restore the supply to the switch/ socket breaker in consultation with the maintenance official.
13	Carryout out fault diagnosis and repairs during the works other than during preventive maintenance in coordination with NFC personnel.

2. (a to d) Preventive Maintenance, Overhauling & Repair of Motors

Sl.No.	Checklist
1.	Disconnect/Isolate Power supply of motors from MCC breaker in consultation with the maintenance official. Remove fuses and keep the fuses in self custody.
2.	If MCCB is used in MCC , Switch "OFF" the MCCB breaker in consultation with the maintenance official and if locking provision is available, lock it.
3.	If locking provision is not available in case of MCCB, isolate the control circuit breaker in consultation with the maintenance official.
4.	Put a Danger Board indicating "MEN ON LINE", " DON'T SWITCH ON" at SFU/ MCCB operating handle of MCC.
5.	Clean the motor body and fan cover.
6.	Check the earthing terminals and continuity.
7.	Check the terminal block , clean it and tighten all the terminals.
8.	In case of slip ring motors check the condition of slip rings, brushes clean then properly.
9.	Measure IR value of Winding to Body and record it. Measure WR (Winding Resistance) value and Record it.
10.	If IR value is less than $1M\Omega$, then drying is required.
11.	Observe the bearing sound by rotating the shaft by hand. Check for the shaft balance by rotating it and noting down its final rest position.
12.	If bearing sound is not smooth, greasing may be required. Replacement may be required in extreme case after taking clearance from Maintenance official.
13.	Remove the motor from foundation with the help of proper lifting arrangements. The lifting arrangement will be provided by NFC.
14.	Before replacement of bearings , dismantle the rotor properly. For handling the rotor chain pulley block or zip crane is to be used as per the site condition.
15.	After removing of rotor, cover the stator properly with a clean polythene sheet.
16.	If drying is required , dismantle the fan, rotor etc . properly and dry the motor using a

	hot air blower.
17.	Motor should be dried till insulation resistance rises above 1M ohm.
18.	After drying , air drying insulating varnish should be applied on the winding surface when motor is in hot condition.
19.	After that assemble the rotor, fans etc. whatever removed.
20.	If bearing replacement required , follow below mentioned procedure : -
	(i) Remove the bearing with proper bearing puller
	(ii) Clean the shaft .
	(iii) Clean bearing housing.
	(iv) Examine the bearing housing for any signs of wear, Repair or Repair the housing if necessary.
	(v) Assemble the bearings.
	(vi) If bearing is sealed one greasing is not required.
	(vii) Assemble the dismantled parts of motor.
	(viii) Rotate the shaft by hand and observe the smoothness of bearings.
21.	After above works install the motor.
22.	After proper installation of motor, connect the earthing. Connect the motor terminals properly.
23.	Ensure the gasket of the terminal covers in place.
24.	Switch ON the motor at no load and check the direction of motor rotation.
25.	If motor direction is not OK, interchange the phase and run the motor.
26.	Record the no load current.
27.	After above work inform NFC for arrangement of proper alignment of motor with load part (i.e. Fan or Pump) whichever applicable.
28.	If any of the motors need replacement during faults to cater the urgent requirement, carryout routine testing out of the new motors before installation to the unit.
29.	Shifting of motors from field to central workshop and vice-versa for overhauling work is in the scope of contractor.
30.	Transportation means like battery operated pallet trucks / forklifts will be arranged and operated by NFC personnel.

3. Maintenance of Fans/Exhaust Fans/Man Coolers::

Sl.No.	Checklist
1.	Identify the switch from which the supply to the Fans/Exhaust Fans fitting is fed.
2.	Check if the speed regulator and capacitor are functioning properly.
3.	Carryout the repair and rectification of the fitting, connecting cables as required.
4.	Check out the winding condition. Replace the fan if found burnt.
5.	Ensure working of the fan after replacement.

4. Cable Laying:

Sl.No.	Checklist
1	3.5Core, Armoured / flexible 1.1kv grade LT power cables, sizes varying from 50sqmm to 300sqmm are to be laid as per standard electrical practice.
2	Cables are to be laid in the shop floor during installation of new equipments/

	rectification and repairs of equipments/ revamping of equipments.
3	Cables have to laid on ground/ in existing trenches or overhead trays as per the requirement.

5. Maintenance & Repair of HPMV lamps:

Sl.No.	Checklist
1.	Identify the LDB from which supply is being fed to the lamp in consultation with the maintenance official. Isolate lighting power supply by switching off the MCB of the corresponding row and also incomer MCB.
2.	Arrange a suitable ladder / hydraulic ladder in consultation with the maintenance official for reaching up to the lamp. In case the lamp is above EOT crane, use the crane with due permission from the maintenance official
3.	Wear all the PPEs like helmets, shoes etc.
4.	Ensure the ladder is below the fitting for which maintenance is to be carried out.
5.	Wear full body harness safety belt and secure it properly.
6.	Carry out maintenance in the fitting and in junction box. Replace fittings/lamps if required.
7.	Untie the safety belt, step down from the ladder on to the CT girder and switch on the power supply. Ensure working of the lamp and fitting.
8.	Remove all the fittings and lamps after maintenance from the crane and store them at their designated places.
9.	Carryout testing of the removed fitting after maintenance in the work shop and store at identified locations in consultation with the maintenance official.

6. Maintenance & Repair of Fluorescent lamps:

Sl.No.	Checklist
1.	Identify the MCB from which the supply to the lamp fitting is fed.
2.	Check if the starter, choke and lamp are functioning properly.
3.	Carryout the repair and rectification of the fitting, connecting cables as required.
4.	Replace the lamp/ fitting if necessary.
5.	Ensure working of the fitting and lamp.
6.	Carryout the repair of the removed fitting at the workshop

7. Preventive Maintenance & Repair of Cranes:

Sl.No	Checklist
1	Isolate the main incomer of the furnace in consultation with the maintenance official.
2	Check the cable condition, renew, if required.
3	Check the main switch for proper operation.
4	Check the connections of 1) Motor 2) Starter 3) Resistance boxes and oil levels.
5	Check the condition of bearings of motor (By starting).

6	Clean the contacts and avoid core chattering.
7	Check smooth operation of the starter.
8	Check for smooth operation of push buttons in the pendent control box.`
9	Inspect the motor terminals and tighten, if required
10	Inspect the connections at brushes and sliprings of all motors.
11	Checks on Main HOIST:
12	Inspect mounting of gear operated limit switch, condition of sprocket chain link
13	Check whether the motor is off, when limit switch operates.
14	Bypass the gear operated limit switch, Check whether the motor is off, when gravity limit switch operates.
15	Open the Gravity limit switch cover , inspect the cam mechanism, tighten the wire connections, replace the damaged parts,.
16	Checks on Auxiliary HOIST:
17	Inspect mounting of gear operated limit switch, condition of sprocket chain link
18	Check whether the motor is off, when limit switch operates.
19	Bypass the gear operated limit switch, Check whether the motor is off, when gravity limit switch operates.
20	Open the Gravity limit switch cover , inspect the cam mechanism, tighten the wire connections, replace the damaged parts,.
21	Check the long travel motor is off when end travel lever operated limit switches operated, in both directions
22	Check the cross travel motor is off when end travel lever operated limit switches operated, in both directions
23	Check the Junction Box connections
24	Check and note down the Over load settings and fuse ratings of all motors.

8. Preventive Maintenance of Furnaces:

i) Reduction Furnace/Coking Furnace:

Sl.No	Checklist
1	Isolate the main incomer of the furnace in consultation with the maintenance official.
2	Check the contactor for chattering and clean the core, if required.
3	Ensure that correct rated HRC fuses are intact in position.
4	Check the connections of the heating elements of all the phases.
5	Check the resistance of the following Zones:
	a) All Zone Heaters
	b) All Line Heaters
6	Check and ensure proper earthing for the furnace and control panel.

ii) Distillation Furnace:

Sl.No.	Checklist
1.	Isolate the main incomer of the furnace in consultation with the maintenance official.
2.	Clean ,check and tighten connections in the control panel of the following:
3.	Clean, check the connections of the following:
	a. Connectors.
	b. Circuit breaker.
	c. Isolators.
	d. Control Transformer.
	e. HRC fuse units.
	f. Fuse bases.
	g. Control switches.
	h. Contactors.
	i. Ammeters
	j. Fuse connections.
	k. Bus Bar connections.
	l. Volt-meters.
	m. Clean the core of contactors, if chattering.
	n. ON/OFF switches.
	o. Selector switches
	p. Indication lamps.
4.	Check the condition of lugs of the cables (incoming and outgoing) for the control panel and replace, if required
5.	Check the I.R values of Transformer and transformer oil if necessary.
6.	Check and reinforce the earthing connection to transformer(s).
7.	Record the insulation resistance and winding resistance value of transformer(s).
8.	Isolate supply to the transformer in consultation with the maintenance official and do the following: Inspect end termination on HT and LT side, tighten rectify, if required
9.	Inspect silica gel breather, replace if turned blue.
10.	Check the oil level in the transformer top-up, if required.
11.	Check the following in Furnace Vacuum Pump Motor (Mechanical Pump Motor& Roots Pump Motor)
	a. check O/L relay setting in starter ckt.
	b. Check and tighten the motors terminal connections of roots and mechanical pump.
	c. Ensure same rating of HRC fuses/MCB/MPCB and replace if found inadequate.
	d. Inspect the terminal boxes of all the motors and ensure that they are intact.
12.	Check the connection of Solenoid Valve.
13.	Check the connections of heating elements of 3 zones.
	a. Furnace top zone

	b. Furnace middle zone
	c. Furnace bottom zone
14.	Note the resistance values of each phase of heating elements of all zones.
15.	Clean the fins and fan cover of motor to facilitate ventilation.

B. INSTRUMENTATION:

Scope of Work: To carry out Preventive maintenance of Instrumentation equipment (shutoff valves, electro – pneumatic On/Off valves, Level transmitters installed in ZOP & ZSP plants where acidic process fluids are handled) connected to the process equipment / vessels and / or installed in field and instrumentation control panels installed in these plants. Detailed scope of work for each item is given below.

1. Dismantling, Cleaning, assembling & testing of On/Off Valve:

Sl.No	Checklist
1.	Shifting of dismantled On/Off valve to the maintenance area (removing the valve from process line and mounting of valve in process line will be carried by NFC process crew).
2.	Dismantling of the valve using proper tools & Cleaning the valve thoroughly.
3.	Inspection of parts for any damage/wear-out and Replacement of damaged/wear-out parts with spares like gaskets/circlips (hardware items will be provided by NFC).
4.	Assembling and lubrication of moving parts with grease.
5.	Testing the operation of On/Off Valve.
6.	Shifting of assembled valve to field for mounting.

2. Removing, Cleaning, and mounting of Level Transmitters:

Sl.No	Checklist
1.	Removing the level transmitter from the tank (for non-contact level transmitters).
2.	Shifting of dismantled level transmitter to the maintenance area.
3.	Cleaning the level transmitter thoroughly.
4.	Testing the operation of level transmitter.
5.	Shifting of level transmitter to field and mounting the level transmitter in the tank

3. Cleaning and testing of Shutoff valves in NCF:

Sl.No	Checklist
1.	Shifting of dismantled shutoff valve to the maintenance area (removing the valve from process line and mounting of valve in process line will be carried by NFC process crew).
2.	Cleaning the valve thoroughly and checking for leakage of Shutoff valve, if any.
3.	In case of leakage, replace with a new valve.
4.	Testing the operation of shutoff valve.
5.	Shifting of valve to field for mounting.

4. Preventive Maintenance of Control panels in Reduction, Vacuum Distillation, New Chlorination, SMP and ZOP:

Sl.No	Checklist
1.	Ensure proper Isolation / shut down of Power Supply to the panel from EIC, NFC.
2.	Cleaning of the control panel.
3.	Check the connections of all components and instruments for any loose contacts, burnt terminals, integrity of insulation etc. and Tighten the contacts/terminals.
4.	Carry Zero/Span check of instruments by feeding from calibrator
5.	For Reduction furnace control panels, carry out the following checks in presence of Maintenance official:
	i. Check Pressure transmitters for loose connections & tighten the terminals
	ii. Zero check of Pressure transmitters
	iii. Span check of Pressure transmitters by feeding test pressure
	iv. Check trip amplifiers for loose connections & tighten the terminals
	v. Check contact changeover of trip amplifiers by feeding set point
6.	Ensure that all spare cable gland holes are closed and intact.
7.	Ensure that all cables are identified and are having cable tags.
8.	Check Status of field instruments and replace if corroded.
9.	Ensure the cable screens are connected to signal earth.
10.	Check the healthiness of body earth and signal earth connections.
11.	Inspect and clean the filters/louvers, where fitted.
12.	Ensure that indicating lights/lamps in alarm annunciator, hooter, push buttons, electrical switches on the panel are in good operating condition. Replace the same, if found not working.
13.	Check that there is no dirt, debris, loose items or moisture within the panel.

5. Cleaning and testing of Level switches:

Sl. No	Checklist
	Shifting of dismantled Level switch to the maintenance area (removing Level switch from process line and mounting in process line will be carried by NFC process crew).
1.	Cleaning the Level switch thoroughly and Inspection of parts for any damage/wear-out.
2.	In case of damage, replace with a new level switch
3.	Testing the operation of Level switch.
4.	Shifting of Level switch to field for mounting.

6. Laying works of Signal & Control Cables:

Sl. No	Checklist
1.	Ensure proper Isolation / shut down of Power Supply to the panel & field from EIC, NFC.
2.	Laying of signal/control/compensating/extension cables from the field to the control panel.

7. Removal/Dressing of cables:

Sl. No	Checklist
1.	Ensure proper Isolation / shut down of Power Supply to the panel & field from EIC, NFC.
2.	Identify the cables that are to be removed/dressed.
3.	Carry out removal of the cables/cable trays, as required.
4.	Dress the remaining cables in the cable tray.

8. Cleaning & minor repair of Batteries for UPS units:

Sl. No	Checklist
1.	Ensure proper Isolation / shut down of Power Supply to the panel & field from EIC, NFC.
2.	Identify the batteries to be cleaned and wipe the dust with cloth.
3.	Ensure that the terminals/lugs are not damaged and replace the same, if found worn-out.
4.	Ensure that the battery terminations are tight.
5.	Apply petroleum jelly to the battery terminals to prevent corrosion.

Penalty Clause for non-compliance / deviation of the conditions of the contract:

1. Manpower Envisaged: Contractor shall engage the following manpower daily.

Sl. No.	Trade	Quantity of Manpower
1.	Electrician	4
2.	Electrical Supervisor	1
3.	Instrumentation Technician	2

Attendance will be monitored strictly and deduction will be made from the bill for the absence, as per their daily wages.

2. Penalty Clauses:

a.Attendance Compliance:

Non availability of the technicians/ Supervisor will lead to penalty, over and above minimum wages deduction as per daily requirement.

i. Worker: Total man days/ month = 138 (23 days/month*6 workmen /day).

ii. Supervisor: Total man days/ month = 23 (23 days/month*1 /day).

A minimum attendance of 90% of man days is essential. The attendance will be monitored through labour entry permit system of NFC.

Attendance / month- Non compliance	Penalty as percentage of Monthly bill	
	Worker	Supervisor
90% and above	Nil	Nil
80% - 89 %	1.0 %	2.0%
70% - 79 %	2.0%	3.0%
50% - 69%	5.0%	10.0%
< 50%	Short closing of order	

b.Safety compliance :To be followed by all contract workmen and Supervisor

- i. All contract workers should always wear PPE's like safety shoes, ear plug and nose mask etc.
- ii. Attend safety Training
- iii. Always wear Uniform
- iv. Should restrict themselves to concerned area only.
- v. Should not operate EOT cranes/hydraulic presses.
- vi. Follow work - specific do's and don'ts given by EIC

Any deviation of the above by any of the contact work men /Supervisor will attract the following penalty

Safety -Non compliance	Penalty
Once/month	Oral warning
Twice /month	0.50% of the monthly bill
2-5 /month	2.0 % of the monthly bill
> 5/month	10.0% of the monthly bill
> 8/month	Short closing of order

Senior Manager
Maintenance Zirconium Group
For & on behalf of the President of India

CHECK LIST FOR THE CONTRACTOR

Sl. No.	General details						
1	Name of the organization						
2	Address						
3	Telephone Nos.						
4	Fax No						
5	E-Mail address						
6	Annual Turn over of previous financial year						
7	SSI/Factory/Contractor's Registration No						
8	Brief description of experience						
9	AADHAAR NO						
10	GST Registration No						
11	PAN NO						
12	ESI Registration No						
13	EPF Registration No						
14	Bank Account No						
15	Name of the Bank						
16	IFSC Code						
17	No. of employees	Highly Skilled		Skilled		Un-skilled	
18	Previous work orders executed at NFC (Reference Nos.)						
19	Brief description of the work*	Preventive Maintenance and minor repair works of MZG equipments					
20	Tender No.*	NFC/MZG(09)/PPM/2018/12					
21	Total amount quoted						
22	No. of labours proposed to be Employed in this work						
		Supervisors:					
23	Qualifications and experience Of Supervisor						
24	Details of Machinery/tools Proposed to be deployed for The work						
25	DST rate considered for the work						
26	Any other information						

* to be incorporated by EIC

Verified the above details

E-I-C

Signature of the contractor

DECLARATION / UNDERTAKING BY THE CONTRACTOR

1. Details of EMD enclosed

DD/BC No.	
Amount (Rs.)	
Date	
Bank	
Branch	

2. My/Our PAN No. is : _____
(Pan Card copy is also enclosed)

3. GST Number: _____

Thanking you,

Yours faithfully,

(Signature of the Contractor with Seal)