

NTPC LIMITED
(A Government of India Enterprise)
FEROZ GANDHI UNCHAHAR THERMAL POWER PROJECT

Description: Biennial Maintenance Contract for Generator monitoring & spares management , Hydrogen system for generator including driers and ACs & Water Coolers in O&M area inside the plant boundary & any area outside the plant related to NTPC Unchahar.

GENERAL SCOPE OF WORK

- (1) The scope of work shall include checking, Overhauling and Attend Defect/ Breakdown of cooling equipment of O&M Area to maintain them in good working condition. The cooling equipment shall mean complete unit of window A.Cs up to 2.5TR, Single or Twin units Split A.Cs (single unit of 2.0TR/2.5TR & twin unit of 1.5TR each or tower AC), Tower AC Water Coolers of O&M area, Hydrogen Drier of 210 MW/500 MW units 1 to 6, and Package ACs of thyristor room of Unit # 1 & 2 (2 units of package A.C.in a room) and also monitoring, Overhauling and Attend Defect/ Breakdown of Hydrogen system and assistance in generator spares management & OH.
- (2) For item no. 10.10, 10.20 & 10.30, the quantity to be executed will be decided by E-i-C/site engineer. The payment shall be made for the actual quantity executed. The spares required for attending defects/ breakdown shall be provided by NTPC Ltd. through supply part of this PO . The party shall keep proper record of spares consumed. The burnt/ damaged components/ equipment will be the property of NTPC Ltd. and will be handed over to NTPC. However , the material/ consumables listed in the list shall be in scope of Vendor. Refrigerant gas charging work, brazing and work in hydrogen proximity area shall be done by experienced technicians.
- (3) The tentative details of air conditioners, water coolers and hydrogen drier etc. presently installed/estimated is as follows. (a) Window AC (1.5/2.0/2.5T) 172 nos. (b) Split AC (single/twin/tower type units) (1.5/2.0/2.5 T)-255 nos. (c) Package AC-04 nos. (With 02 compressors in each unit). (d) Hydrogen drier –12 nos. (e) Water Cooler - 62 Nos. (f) Tower AC (4T)- 2 nos. One package AC unit with two compressors of 10 TR will be considered as one BOQ for each compressor for Item code 10.10. The quantity is only tentative and may change depending upon plants requirement.
- (4) Any material supplied by the party through supply part (through BOQ No. 20) must be new with proper bill (with valid GST No. on the bill) from dealer/agency along with Warranty. The bill & warranty is to be handed over to NTPC Ltd.
- (5) Any work which is not specified in scope of work but required to maintain the machine in good running condition will be carried out by the contractor as per instruction of E-I-C/site engineer without any extra cost payable to them.

SERVICE PART:

01) SI No 10.10 Item code: ELA/C00BD001

Description : A/C SYSTEM (<->) ATTEND BREAKDOWN

The Scope of work for this item code includes:-

- (a) The cooling equipment covered under this BOQ are window AC, split AC, Tower AC, package AC and cassette AC.
- (b) Clean evaporator/condenser coil, filter pad and body etc.
- (c) Check the healthiness of compressor, condenser/ blower fan motor and its alignment and lubricate the bearing/ bush etc.
- (d) Check/ tighten electrical connection and replace the defective wiring and component etc. including earthing.
- (e) Check for any gas/ air leakage and arrest the same. Refill the refrigerant gas if required. Check for choking in drain pipe.
- (f) Attend defect reported or found during check and rectify it.
- (g) Replacing and fixing all spares at no extra cost payable to the contractor. Spares will be supplied by NTPC Ltd. through supply part of this P.O.
- (h) Maintain proper record of this BOQ executed along with spares consumed and submit to E-I-C/site engineer.
- (i) Schedule of execution of this BOQ shall be decided by E-I-C/site engineer.

02) SI No 10.20 Item code: ELWAC000H000

Description: Window AC(<->)-Serv

The Scope of work for this item code includes:-

Overhauling of window AC and split AC is covered under this BOQ and to be carried out as follows:

A. Window AC overhauling:-

- (a) The window AC shall be taken out from its casing to a suitable place.
- (b) Dismantle the window AC and Clean/ wash all part of window AC. Condenser/Evaporator Coil must be cleaned using C-Shine.
- (c) Overhaul the fan motor and lubricate its bush/ bearing.
- (d) Check for any defect and rectify it. Replace any spare parts if required. Charge Refrigerant Gas if Required(Refrigerant Gas Will be Supplied By NTPC Ltd)
- (e) Dressing of wiring and Tighten all electrical connections.
- (f) Painting of window AC if required. Paint (Berger Luxol, Asian Apcolite & Shalimar Superlac) will be supplied by the party free of cost.
- (g) Assemble window AC and take trial run. Check for effective cooling and note down temperature.
- (h) Reinstall window AC to its place.
- (i) Maintain proper record of window AC overhauling along with spares consumed and submit to E-I-C/site engineer.
- (j) Schedule of execution of this BOQ shall be decided by E-I-C/site engineer.

B. Split AC overhauling:-

- (a) Clean indoor unit of split AC with cloth/ brush.
- (b) Clean/ wash all part of outdoor unit of split AC. Condenser/Evaporator Coil must be cleaned using C-Shine.
- (c) Overhaul condenser/ blower fan motors and lubricate bush/ bearing.
- (d) Check for any defect and rectify it. Replace any spare parts if required. Charge Refrigerant Gas if Required(Refrigerant Gas Will be Supplied By NTPC Ltd)
- (e) Dressing of wiring and Tighten all electrical connections.
- (f) Painting of split AC if required. Paint (Berger Luxol, Asian Apcolite & Shalimar Superlac) will be supplied by the party free of cost.
- (g) Take trial run of split AC. Check for effective cooling and note down temperature.
- (h) Maintain proper record of split AC overhauling along with spares consumed and submit to E-I-C/site engineer.
- (i) Schedule of execution of this BOQ shall be decided by E-I-C/site engineer.

03) SI No 10.30 Item code: ELW/C00OH000

Description: Water Coolers (<>) SERVICING

The Scope of work for this item code includes:-

- (a) Clean outer body of water cooler with wet cloth/ soap solution.
- (b) Clean water cooler platform properly.
- (c) Empty water cooler tank, clean it properly with bleaching powder and wash.
- (d) Fill water cooler tank with fresh water.
- (e) Replace water tap/ float ball if required.
- (f) Preventive maintenance of complete unit
- (g) Maintain proper record of water cooler cleaning along with spares consumed and submit to E-I-C/site engineer.
- (h) Schedule of execution of this BOQ shall be decided by E-I-C/site engineer.

04) SI No 10.40 Item code: ELW/C00BD000

Description: Water Coolers (<>) Attend Defect

The Scope of work for this item code includes:-

- (a) The scope of work in this item code is to attend breakdown of water cooler.
- (b) Attend refrigerant gas leakage, refilling of refrigerant gas.
- (c) Check healthiness of compressor, thermostat, and fan motor and rectify the problem.
- (d) Tighten electrical connection and Replacing and fixing spares if required. Spares will be provided by NTPC Ltd. through supply part of this PO.
- (e) Maintain proper record of water cooler breakdown attended along with spares consumed and submit to E-I-C/site engineer.

05) SI No 10.50 Item code: ELWAC02BD804

Description: Window AC (FAN MOT) Rewdg

The Scope of work for this item code includes:-

- (a) Rewinding of burnt single phase AC motors by the party.
- (b) Replace bearing, bush & shaft, if required at no extra cost.
- (c) Removal and re-fixing of motor will be in the scope of the party.
- (d) Motor will be allowed to take outside the plant through returnable gate pass for rewinding purpose.
- (e) Defect liability- 3 months

06) SI No 10.60 Item code: ELWAC53RM001

Description: Window AC (2.0T) EQPT ERN/COMMG

The Scope of work for this item code includes:-

- (a) Cooling equipments covered under this BOQ are window AC, split AC & water cooler.
- (b) Installation testing and commissioning of cooling equipments (fixing of components, refrigerant gas charging etc. if required will be in the scope of the party) provided by NTPC Ltd. at any location decided by E-I-C/site engineer.
- (c) Removal of any cooling equipment if installed already at that place/ location.
- (d) Safely shifting cooling equipment from central store/department store or any other location inside the plant premise to the site and carry back removed cooling equipment to suitable place as decided by E-I-C/ Site Engineer.

10.70 ELH2C02GN869: H2 CYLINDERS (VALVE) SERVICING

Attend Defect valves below 40 NB

REPAIR/REPLACEMENT OF LOW PR.VALVES/GLOBE/GATE/NRV/DIAPHRAGM) UP TO 40NB AND BELOW SIZE.

1. Removal of insulation if required.
2. Complete dismantling of the valve safely by applying proper releasing agent.
3. Cleaning, inspection of complete valve internals.
4. Lapping of seat & disc and blue matching.
5. Checking trueness of the valve stem & repair/replacement of any damaged internals.
6. Matching of valve seat in body disc & correcting if required.
7. Replacement of body gasket & assembly of the valve.
8. If required adding suitable length of spool piece in case of
9. Replacement of the Valve & welding the same.
10. For replacement of water line valves the existing valve will be removed by Dismantling counter flanges & new valve shall be placed in position. If required suitable piece will be welded for due length
11. Radiography if required shall be done by NTPC on free of cost basis.
12. Edge preparation of the spool piece & welding of the valve & spool piece with pipe Line. DP test of welding of the replaced valve.
13. Replacement of gland packing and ensuring free operation of the valve.

14. Re-commissioning of the valve and rectification of defects as necessary.

10.80 SERVICE CODE: ELLPV09OH000

SERVICE DESC: Overhauling of valves 40NB to 50NB

OVERHAULING/REPLACEMENT OF LOW PR.VALVES/GLOBE/GATE/NRV/DIAPHRAGM) UP TO 50NB SIZE.

1. Removal of insulation if required.
2. Complete dismantling of the valve safely by applying proper releasing agent.
3. Cleaning, inspection of complete valve internals.
4. Lapping of seat & disc and blue matching.
5. Checking trueness of the valve stem & repair/replacement of any damaged internals.
6. Matching of valve seat in body disc & correcting if required.
7. Replacement of body gasket & assembly of the valve.
8. If required adding suitable length of spool piece in case of
9. Replacement of the Valve & welding the same.
10. For replacement of water line valves the existing valve will be removed by Dismantling counter flanges & new valve shall be placed in position. If required suitable piece will be welded for due length
11. Radiography if required shall be done by NTPC on free of cost basis.
12. Edge preparation of the spool piece & welding of the valve & spool piece with pipe Line. DP test of welding of the replaced valve.
13. Replacement of gland packing and ensuring free operation of the valve.
14. Re-commissioning of the valve and rectification of defects as necessary.

10.90 SERVICE CODE: ELLPV11OH000

SERVICE DESC: Overhauling of valves 65NB to 80NB

OVERHAULING/REPLACEMENT OF LOW PR.VALVES GATE/GLOBE/NRV/BUTTERFLY/DIAPHRAGM) From 50-100NB SIZE.

1. Removal of insulation if required.
2. Complete dismantling of the valve safely by applying proper releasing agent.
3. Cleaning, inspection of complete valve internals.
4. Lapping of seat & disc and blue matching.
5. Checking trueness of the valve stem & repair/replacement of any damaged internals.
6. Matching of valve seat in body disc & correcting if required.
7. Replacement of body gasket & assembly of the valve.
8. If required adding suitable length of spool piece in case of

9. Replacement of the Valve & welding the same.
10. For replacement of water line valves the existing valve will be removed by Dismantling counter flanges & new valve shall be placed in position. If required suitable piece will be welded for due length
11. Radiography if required shall be done by NTPC on free of cost basis.
12. Edge preparation of the spool piece & welding of the valve & spool piece with pipe Line. DP test of welding of the replaced valve.
13. Replacement of gland packing and ensuring free operation of the valve.
14. Re-commissioning of the valve and rectification of defects as necessary.

10.100 SERVICE CODE: ELGIP00GN400

SERVICE DESC: GI PIPE (<->) Install/Remove

FABRICATION AND ERECTION OF LOW PRESSURE. PIPE LINE AS PER SCOPE OF WORK

1. THE SCOPE ENVISAGES REPLACEMENT OF LOW PRESSURE PIPE/BENDS IN STEAM/WATER PIPE LINES IN TG AREA.
2. ERECTION OF SCAFFOLDING TO MAKE PROPER AND SAFE APPROACH. CUTTING OF OBSTRUCTIONS/SUPPORTS IF REQUIRED.
3. AGENCY HAS TO CUT THE PIPE BY GRINDING/GAS CUTTING AS PER EIC AND PREPARE THE EDGE.
4. LAYING OF PIPE LINE/BENDS AND ENSURE PROPER FITUP. WELDING BY NTPC APPROVED WELDER.
5. REMOVAL OF APPROACH PLATFORM/SCAFFOLDING AND TRANSPORTING TO THE STORE AREA CLEANING AND SHIFTING OF SCRAP TO THE PLACE IDENTIFIED BY EIC.
6. SUCCESSFULLY COMMISSIONING THE LINE AND ATTENDING THEREPAIRS IF ANY.
7. WELDING ELECTRODES, GAS, CONSUMABLES SHALL BE IN AGENCY SCOPE.
8. IF PIPE SIZE IS LESS THAN 100mm, THEN MEASURED QTY WILL BE 50% OF ACTUAL QTY.

10.110 SERVICE CODE: **ELMSL16BD000**

SERVICE DESC: MS Piping (NB100) Attend Defect

REPAIR OF FLANGE LEAKAGE UPTO 100 MM SIZE. (STAGE I, II, III & IV)

1. Loosening of flange bolts & taking out all the bolts & gasket in between.
2. Cleaning the mating faces of the flange
3. Repairing of the eroded/cut faces of the flange by metal build up & then grinding etc.
4. If proper space to clean/inspect the faces could not be made the pipe will have to be cut & re welded after fixing the defect.
5. Preparing new gasket & assembly of the flange with new gasket.

6. Charging of the medium through the valve & checking any leakage through the flange.
7. One OPR means one No. flanged joint

10.120 SERVICE CODE: ELMSL21BD000

SERVICE DESC: MS Piping (NB300) Attend Defect

REPAIR OF FLANGE LEAKAGE ABOVE 100MM & UPTO 300MM SIZE (STAGE I, II, III & IV)

1. Loosening of flange bolts & taking out all the bolts & gasket in between.
2. Cleaning the mating faces of the flange
3. Repairing of the eroded/cut faces of the flange by metal build up & then grinding etc.
4. If proper space to clean/inspect the faces could not be made the pipe will have to be cut & re welded after fixing the defect.
5. Preparing new gasket & assembly of the flange with new gasket.
6. Charging of the medium through the valve & checking any leakage through the flange.
7. One OPR means one No. flanged joint

10.130 SERVICE CODE: ELMSW00GN250

DESC: Misc Works (<>) Fabrication

1. Dismantling, cutting and removal of old steel structure and fabrication,
2. Erection of new steel structure, supports, platforms, pipelines, pipe bends, railings, pump foundation platform, stair cases and its supports & any other structure in turbine area
3. Painting with one coat of primer and two coats of enamel paint there of as per instruction of Engineer-in-charge or area engineer.
4. Before Fabrication at site, proper measurement of steel plates, angles and channels is to be done to minimize wastage
5. Welding work should be done to ensure complete safety of the structure in terms of strength and stiffness.
6. Synthetic Enamel paint and primer paint for the fabricated structures and pipe lines supports etc are to be provided by agency. Consumables required for painting shall also be provided by the agency at his own cost. Total paint thickness should not be below 75 microns.
7. NTPC approved quality electrode should only be used.
8. After each activity (e.g. cleaning, primer application, 1st coat & 2nd coat of paint) the area painted is to be approved by Engineer-in-charge or his representative. Surfaces shall be cleaned thoroughly to remove oil grease, rust, existing paint etc. by wire brush/emery paper etc.
9. Apply one coat of primer of minimum thickness 25 microns. There after apply two coats of the synthetic enamel paint. The standard film thickness after drying should not be less than 25 microns for each coat. However the total paint thickness of after application of primer & paint

shall not be less than 75 microns. The color of the paint shall be as per NTPC color coding scheme & as decided by Engineer-in-charge or area engineer.

10. Wherever any fabrication is done alongside the existing structure/pipe the color has to be matched with existing structure/pipes etc. The area affected by welding to existing structure/pipe has also to be suitably painted with matching color.

11. For pipe line work, proper welding procedure is to be adopted through appropriate edge preparation grinding as per instruction Engineer-in-charge or area engineer.

12. Necessary pipes, steel, valves etc. shall be provided by NTPC. Any special electrodes other than general purpose electrodes shall be provided by NTPC.

13. The necessary flange, dummies, reducers, bends and clamps etc. are to be fabricated by the agency wherever required.

14. Necessary structural jobs/clamps required for supporting the pipe line/structures shall be done by the agency. Material for this work shall be given by NTPC.

15. Agency has to produce the Material Reconciliation statement for the quantum of work done against BOQ in each RA bill.

16. Payment shall be made on basis of actual tonnage of the fabricated and erected items.

Item 10.140 :(ELGEN29BD800) GENERATOR COMPRESSOR Repl :- Replacement of Hermetically Sealed Compressor of H2 Drier

- (1). Remove defective compressor from location.
- (2). Transport equipment away from fire safety hazard zone if necessary.
- (3). Fit new compressor in position.
- (4). Do brazing of copper tubes.
- (5). Charging of gas & attending leakage if any.
- (6). Fixing equipment in location.
- (7). Trial run of compressor / equipment & rectification of defects if found.

Item 10.150 :(ELGEN03PM000) :- Daily Checks of Generator/H2 Dryer/H2 System

The work shall be executed as per instruction of EIC, following work is covered under the scope of the item:-

- (1).To assist in the activities i.e. fitting of air hoses/regulators etc of gas (H2/CO2/Air) purging.
- (2). Checking for any abnormality in Hydrogen dryer and identify the same

Item 10.160 :(ELGEN03GN562) :- GENERATOR (>210-500MW#) (LEAKAGE ATTENDI

- (1) The scope would include only external leakages of hydrogen i.e. from pipe line end shields, manifold, valves etc
- (2). The hydrogen leakage is to be checked with the help of soap solution/ leak detector

- (3). If leakage is found it has to be attended by tightening, brazing or by applying on line sealing method. Replacement of valve, flange and piping is not in the scope of this service.
- (4). If leakage is found from end shield the repair of the same will be tried by applying on sealing putty.

Item 10.170 : (ELH2D00GN055) :- H2 DRIER (<>) BRAZING

- (1). Checking of refrigerant leakage through brazed joint in H2 drier unit/package AC
- (2). Attending of leakage if persists through brazed joint by cleaning & brazing of joints.
- (3). Checking of joint for refrigerant leakage after attending the leakage.
- (4). Trial operation of hydrogen drier unit/Package AC

Item 10.180 : (ELH2D00PM004) :- H2 DRIER (<>) 04W Chks

- (1). Proper inspection of Dryer
- (2). Cleaning of condenser.
- (3). Checking gas pr. and cooling temp. Fill gas if reqd.
- (4). Checking/ attending for leakage of refrigerant, if any.
- (5). Internal & external cleaning of Hydrogen dryer

Item No. 10.190 (ELGEN02GN900) Generator (>110-210MW#) Testing

- (1) Facilitate the purging and ATT activities
- (2) Shifting of spares from site store to OH site
- (3) Record Keeping as per instruction of Area in charge
- (4) Attending the shift duty as per the OH activity
- (5) To assist in the activities of gas (Air/CO2/H2) Charging.
- (6) Agency shall deploy extra manpower during OH if required/ as per instruction of EIC for meeting the OH schedule.
- (7) For measurement purpose assistance during one OH shall be considered as one quantity.
- (8) If agency fails to deploy manpower for any activities during OH, 50% amount shall be deducted

Item No. 10.200 :(EL0107028244) ASSISTANCE IN EMD STORE MANAGEMENT

1. Keeping record of different kind of generator spares
2. Ensure proper tagging of material
3. Up keeping of store
4. Agency shall deploy extra manpower during OH if required/ as per instruction of EIC for meeting the OH schedule.
5. If agency fails to deploy HSW manpower for any activities, 50% amount shall be deducted

Item No. 10.210 :(ELBDT05PM012) Bus Ducts (21KV) 12W Chks

1. Proper inspection of Bus duct pressurisation system .
2. Cleaning of pressure switches , solenoid operation , timer operation , drain valves operation etc.
3. Checking air suction pressure and discharge air dew point.
4. Checking/ attending for leakages , if any.
5. Internal & external cleaning of Bus duct pressurisation system.

Item No. 10.220 : ELADU000H001: Air Drying Unit (<=>) OH

Hydrogen Dryer OH

1. Removal of insulation if required.
2. Complete dismantling of the valves (inlet/outlet /drain or any valve in the path) , flanges, pipes , heat exchanger , preccoler , chiller , safely by applying proper releasing agent.
3. For valves : Cleaning, inspection of complete valve internals. Lapping of seat & disc and blue matching. Checking trueness of the valve stem & repair/replacement of any damaged internals .Matching of valve seat in body disc & correcting if required. Replacement of body gasket & assembly of the valve. If required adding suitable length of spool piece in case of replacement of the Valve & welding the same . For replacement of water line valves the existing valve will be removed by Dismantling counter flanges & new valve shall be placed in position. If required suitable piece will be welded for due length. Radiography if required shall be done by NTPC on free of cost basis. Edge preparation of the spool piece & welding of the valve & spool piece with pipe Line. DP test of welding of the replaced valve. Replacement of gland packing and ensuring free operation of the valve. Re-commissioning of the valve and rectification of defects as necessary.
4. THE SCOPE ENVISAGES REPLACEMENT OF LOW PRESSURE PIPE/BENDS. AGENCY HAS TO CUT THE PIPE BY GRINDING/GAS CUTTING AS PER EIC AND PREPARE THE EDGE. LAYING OF PIPE LINE/BENDS AND ENSURE PROPER FITUP. WELDING BY NTPC APPROVED WELDER. SUCCESSFULLY COMMISSIONING THE LINE AND ATTENDING THEREPAIRS IF ANY.WELDING ELECTRODES, GAS, CONSUMABLES SHALL BE IN AGENCY SCOPE.
5. Loosening of all flange bolts & taking out all the bolts & gasket in between. Cleaning the mating faces of the flange. Repairing of the eroded/cut faces of the flange by metal build up & then grinding etc. If proper space to clean/inspect the faces could not be made the pipe will

have to be cut & re welded after fixing the defect. Preparing new gasket & assembly of the flange with new gasket. Charging of the medium through the valve & checking any leakage through the flange. One OPR means one No. flanged joint

6. Checking for any defect, refrigerant gas pressure and filling if required. Checking for any other problem associated with the system such as blower, condenser, expansion v/v, cut-tubes, cut in/out, evaporator/ pre-cooler.

7. IN Case of LEAKAGE : Attending of leakage if persists through brazed joint by cleaning & brazing of joints. Checking of joint for refrigerant leakage after attending the leakage

8. CLEANING of condenser.

9. In case of compressor replacement : Remove defective compressor from location. Transport equipment away from fire safety hazard zone if necessary. Fit new compressor in position .Do brazing of copper tubes. Charging of gas & attending leakage if any. Fixing equipment in location .Trial run of compressor / equipment & rectification of defects if found.

Item no 10.230 FILTER Cleaning -- *ELFLR00GN100 – SERVICING PRIMARY WATER FILTERS/RESIN BED/SEAL OIL FILTERS: a) Dismantling of filter. b) Cleaning of filter and replacement of filter element if required. c) Replacement of gaskets of associated pipeline, drain and vent plugs. Checking of thread of vent/drain plug and rectify any defects. d) Assembly of filter. e) Dismantling of resin bed/ion-exchanger, replacement of resin & Assembly of bed/ion exchanger. f) Other related jobs as per instructions of Engineer-in-charge.

Item no 10.240 Generator (>210-500MW#) Painting -- *ELGEN03GN750 – Painting of generator & its auxiliary equipment's, pipelines (externally) bus ducts etc. as per following details:- a) Thorough cleaning of surface to be painted with the help of suitable chemicals (cleaning agent). b) Apply zinc silicate primer where ever required. c) Spray painting (two coats) Colour shed code: RAL 5012 OR as per instructions of EIC. d) Apply grease on glass before painting and clean it after finishing paint. e) Making scaffolding wherever required. Scaffolding Material will be supplied by NTPC on returnable basis. Cost of the materials which is not returned, will be recovered from the party. Removing of scaffolding after completion of the work and shifting of the scaffolding materials from stores to site & site to store. f) Material such as paint, primer and thinner will be arranged by NTPC free of cost. g) All T&P and consumables such as compressor, painting guns, hose, etc. and wire brush, emery paper, cleaning agent, markin cloth etc. will be in the scope of contractor. h) Removal of scrap generated, from work place regularly (daily basis) and disposed off at suitable and marked place. i) Empty drums of the paint and thinner etc. should be returned to NTPC.

Item No. 250 Misc Works (<>) DATA MGMT - *ELMSW00GN156 –

DAILY MONITORING OF VITAL PARAMETES OF GENERATORS AND AUXILIARIES (STAGE-I , II, III & IV)

a) Following readings are to be taken daily basis:-

(1) All vital parameters of generators on prescribed format. Data check sheets to be provided by the contractor.

(2) All Miscellaneous records are to be noted as per instruction of EIC or his representative.

b) All reading are to be entered in computer. The short record of all readings and deviation is to be submitted on daily basis.

c) All records to be collected from running or electrically charged equipment's. Hence for safety of man & machines, skilled and computer literate personnel must be deployed for above job on daily basis.

d). other related jobs as per instructions of Engineer-in-charge.

Item no 10.260 GEN. GAS SYSTEM Checking -- *ELGGS00GN106 – At the H2 pressure of generator casing of 2 KSC (210 MW THRI Generators) or 3.5 KSC (210 MW THW Generators and 500 MW Generators), check leakages of Generator H2:- a) In stator water bushing, gas pipe lines, end shield, gas coolers covers, impulse lines, gas driers, manholes, valve glands, gas filling room etc. as per check list with soap solution &/or H2-leak detector. b) In all phase and neutral bushings (only during unit shut down). c) Attend (Generator External) leakages observed from pipe lines, valves, welding joints, flange, valve glands etc. during the leakages check (if possible on-line). (This does not include leakage from gas cooler tube, terminal/stator water bushing gasket, seal cover gasket, end shield cord and winding bar/ Teflon hose leakages.) d) Repeat the process after attending leakages (if possible on-line) till the successful completion of Generator H2-lekage. e) Other related jobs (such as NITROGEN/CARBON DIOXIDE GAS SYSTEM leakage detection & rectification) as per instructions of Engineer-in-charge.

Item no 10.270 - Generator (COOLER) Serv -- *ELGEN15OH000 -- SERVICING OF PRIMARY WATER / SEAL OIL COOLERS:- a) Draining and venting of water / oil , Dismantling of all pipe lines & vent lines of cooler. b) Dismantling of cooler base bolts. c) Lifting the cooler from foundation to work place. d) Removal of cooler top cover and cleaning all the tubes with Nylon brush and water . e) Drying out the tubes with compressed air. f) Conducting Hydraulic test as per instructions of E-I-C. g) Checking of leakage in tubes and plugging/rectification of faulty tubes. h) Conducting final Hydraulic Test as per instructions of Engineer-In-Charge. i) Replacement of gaskets with new ones, shifting of cooler to foundation and boxing up of cooler. j) Assembly of all pipe lines and vent lines. Welding of any cracks in the pipe line/cooler. k) Charging of cooler and rectification of any defects, if any. l) Other related jobs as per instructions of Engineer-in-charge.

10.280 SEAL OIL SYSTEM Serv -- *ELSOS00OH000 – Servicing/replacement of DPR/EQUILIZER/OTHER valves of generator & auxiliary system:- a) Isolation of valves. b)

Disconnection of oil and gas impulse lines. c) Dismantling of oil pipe lines. d) Shifting valves to maintenance room. e) Dismantling of valve. f) Cleaning of valve. g) Replacement of bellows/DIAPHRAGM if required. h) Assembly of valve. i) Assembly of pipelines. j) Charging and venting of DPR /EQUILIZER/other valve. k) Checking of gas and oil leakages and attending the same. l) Other related jobs as per instructions of Engineer-in-charge. Item no

10.300 TANK Serv -- *ELTNK000H000 -- INSPECTION AND CLEANING SEAL OIL TANK/ EXPANSION TANK/PRIMARY WATER TANK:- a) Opening of inspection window/top cover. b) Thorough cleaning of tanks. c) Servicing of float valve of Expansion tank and Seal oil tank. d) Replacement of gasket. e) Cleaning of gauge glasses. f) Box up of tanks after due clearance from EIC. g) Attending any leakage/abnormality after filling of tank. h) Other related jobs as per instructions of Engineer-in-charge.

SUPPLY PART:

01) SI No 20.10 Item code: ELWAC52GN630

Description: Window AC (1.5T) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new compressor of upto 1.5 TR (make same as make of defective one or Hitachi/Copland/Kirloskar/Tecumseh/Carrier/Godrej or as per decision of E-I-C/site engineer) rating for window/split AC/cooling equipment/Hydrogen drier.

02) SI No 20.20 Item code: ELWAC53RM000

Description: Window AC (2.0T) MATL SUPPLY

The Scope of work for this item code includes:-

(a) Supply of new compressor of 2.0 TR (make same as make of defective one or Hitachi/Copland/Kirloskar/ Tecumseh /Carrier/Godrej or as per decision of E-I-C/site engineer) rating for window/split AC/cooling equipment.

03) SI No 20.30 Item code: ELWRC00RM002

Description: Water Coolers Comp (<>) DESIGN/SUPP/ERN

The Scope of work for this item code includes:-

(a) Supply of new compressor of <=1.0 TR (make same as make of defective one or Hitachi/Copland/Kirloskar/ Tecumseh /Carrier/Godrej or as per decision of E-I-C/site engineer) rating for water cooler or Hydrogen drier.

04) SI No 20.40 Item code: ELWAC02GN630

Description: Window AC (FAN MOT) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new single phase or DC condenser/blower fan motor (make Marathan / Coolex /Crompton Greaves Ltd/Khaitan/Bajaj/Champion/Usha make) or as per decision of E-I-C of required rating/capacity for air conditioner and water cooler.

05) SI No 20.50 Item code: ELH2D00GN630

Description: H2 DRIER (<>) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new three phase condenser/blower fan motor (make Marathan /Crompton Greaves Ltd/Khaitan/Bajaj/Champion/Usha make) or as per decision of E-I-C of required rating/capacity for hydrogen drier.

06) SI No 20.60 Item code: ELWAC22GN630

Description: Window AC (FAN BLADE) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new fan blade of required size as of damaged one for all type of blower/condenser fan for air conditioners, water coolers and hydrogen drier.

07) SI No 20.70 Item code: ELWAC06GN630

Description: Window AC (CAPACITOR) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new starting capacitor of required capacity as of damaged one for air conditioners, water coolers and hydrogen drier.

08) SI No 20.80 Item code: ELWAC01GN630

Description: Window AC (COND.) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new running capacitor of required capacity as of damaged one for air conditioners, water coolers and hydrogen drier.

09) SI No 20.90 Item code: ELWAC08GN630

Description: Window AC (THRMOSTAT) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new thermostat of required rating as of damaged one for air conditioners, water coolers and hydrogen drier.

10) SI No 20.100 Item code: ELWAC00GN630

Description: Window AC (<>) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new selector switch of required size/capacity as of damaged one.

11) SI No 20.110 Item code: ELWAC03GN630

Description: Window AC (FRONT GRIL) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new front grill of required size as of damaged one for window AC.

12) SI No 20.120 Item code: ELSAS00RM000

Description: SPLIT A/C (<>) MATL SUPPLY

The Scope of work for this item code includes:-

(a) Supply of new capillary with filter of required size/capacity as of damaged one.

13) SI No 20.130 Item code: ELWAC00RM002

Description: Window AC (<>) DESIGN/SUPP/ERN

The Scope of work for this item code includes supply of window AC body as per following:-

(a) Supply of new window AC Body of 1.5 TR capacity of make Commander/skoda/Napolion/Totaline/Videocon or as per decision of E-I-C/site engineer.

The body should be complete with all accessories (i.e. main body, condenser & evaporator coil, Fan motor with blades, front grill, thermostat, selector switches, capillary with filter, air filter/mesh etc.) except compressor and refrigerant gas.

14) SI No 20.140 Item code: ELWAC14BD800

Description: Window AC (AIR FILTER) Repl

The Scope of work for this item code includes:-

(a) Supply of new Air filter (Plastic mesh) of required size as of damaged one for window and split AC.

15) SI No 20.150 Item code: ELW/C00RM000

Description: Water Coolers (<>) MATL SUPPLY

The Scope of work for this item code includes:-

(a) Supply of new water tap (copper or stainless steel) of required size as of damaged one for water cooler.

16) SI No 20.160 Item code: ELWRC00RM000

Description: Water Coolers Comp (<>) MATL SUPPLY

The Scope of work for this item code includes:-

(a) Supply of 15 nos. new float ball with complete assembly of required size as of damaged one for water cooler.

(b) Supply of 15 nos. new water tank cover gasket of required size as of damaged one for water cooler

17) SI No 20.170 Item code: ELW/C07RM000

Description: Water Coolers (RELAY) MATL SUPPLY

The Scope of work for this item code includes:-

(a) Supply of new relay/overload of required rating as of damaged one for air conditioners, water coolers and hydrogen drier.

18) SI No 20.180 Item code: ELPAC03RM000

Description: PKG AC (<=15TR) MATL SUPPLY

The Scope of work for this item code includes:-

(a) Supply of new catch all drier (liquid line filter drier) of required size as of damaged one for package AC of thyristor room.

19) SI No 20.190 Item code: ELWAC18GN630

Description: Window AC (BUSHING) Matl Supply

The Scope of work for this item code includes:-

(a) Supply of new bearing/ shaft Bush/motor clamp bush(rubber) with clamp for fan motors of window or split air conditioners/ water coolers/ hydrogen driers.

(b) Required bearing/bush should be of same size as of damaged one.

20) SI No 20.200 Item code: ELWAC51GN630

Description: Window AC (1.0T) MATL SUPPLY

The Scope of work for this item code includes:-

Supply of refrigerant gas R22 , R32 , 407, 134 etc for window or split air conditioners/ hydrogen driers. R22/R134 gas to be supplied **in can size of 400/450 gm of make floron , hitop & refromax only.**

21) SI no 20.210 Item code: ELSPA28GN630

Description : Split AC (CONTACTOR) Matl Supply

Supply of single-phase power contactor for split ac.

Supply of single power contactor for split ac suitable for all brand/ capacity/ make such as Voltas/LG/ Carrier/ Llyod/ Usha/Godrej as required as per direction of EIC.

22) SI no 20.220 Item code: ELSPA12BD800

Description : Split AC (REMOT.CKT UNIT) Repl

Supply of PCB with remote and display unit of split ac:

Supply of PCB with remote and display unit of split ac suitable for all brand/capacity/ make such as Voltas/LG/ Carrier/ Llyod/ Usha/Godrej as required as per direction of EIC.

23) SI no 20 .230 Item code: ELSPA02BD800

Description : Split AC (COOLNG COIL) Repl

Supply of 1.5/ 2 tr split ac evaporator unit (copper) with all accessories and remote with one year warranty / guarantee suitable for all split ac of all brands installed in plant, of reputed brand/ capacity/ make such as Voltas/ LG/ Carrier/ Llyod/ Usha / Godrej as required as per direction of EIC.

24) SI no 20 .240 Item code: ELSPA53GN630

Description : Split AC (2.0T) Matl Supply

Supply of 1.5/ 2 tr split ac condenser unit (copper) with all accessories excluding compressor with one year warranty / guarantee suitable for all split ac, of all brands installed in plant, of reputed brand/ capacity/ make such as Voltas/ LG/ Carrier/ Llyod/ Usha / Godrej as required as per direction of EIC.

25) SI no 20 .250 Item code: ELSPA04GN630

Description : Split AC (VALVE) Matl Supply

Supply of line valve for split ac (1 no = a set of 1/4#, 1/2#, 3/8# 5/8# each) suitable for all brand / make, capacity, as required as per direction of EIC.

26) SI no 20.260 Description :Window AC (DRAINPIPE) Matl Supply
Supply of AC drainpipe for different make window AC as per direction of EIC as required

27) SI no 20.270 Description :Split AC (DRAINPIPE) Matl Supply
Supply of drain pipe for different make split AC as per direction of EIC as required.

28) SI no 20.280 Description :SUPPLY OF 4 TON TOWER AC COMPRESSOR

Supply of three phase 415v +/-10% ac, 50hz, 4 tr compressor, with one year warranty/guarantee suitable for all tower ac of all brand installed in plant, of reputed make/ brand/ manufacturer such as Kirloskar/ Tekumshe/ Shriram/ Emersion/Toshiba/ Mitsubishi/ Danfoss/ LG/ Godrej/ Samsung/ voltas/ hitachi/ Lloyd/carrier/ onida as required as per direction of EIC.

29) SI no 20.290 Description :SUPPLY OF PCB/REMOTE INVERTER AC 1.5/2T

Supply of PCB with remote and display unit of inverter split AC 1.5 tr / 2 tr suitable for all brand/capacity/ make such as voltas/ lg/ carrier/ feeder llyod/ godrej/ llyod as required as per direction of EIC.

30) SI no 20.300 Description : SUPPLY OF AC 2.5/3T COMPRESSOR

Supply of 2.5/3 tr (reciprocating or Rotary) compressor:
Supply of three phase 415v +/-10% ac, 50hz, 2.5/3 tr reciprocating or Rotary compressor, with one year warranty/ guarantee suitable for all window ac, split ac, of all brand installed in plant, of reputed make/ brand/ manufacturer such as kirloskar/tekumshe/ shriram/ emersion/ toshiba/ mitsubishi/ danfoss/ lg/ godrej/ samsung/voltas/ hitachi/ lloyd/ carrier/ onida as required as per direction of EIC.

31) SI no 20.310 Description : SUPPLY OF AC COPPER TUBE

Supply of copper tubes of different sizes (1/2", 3/8", 5/8", 3/4", 1/4 ") for AC as required as per direction of EIC.

32) SI no 20.320 Description : SUPPLY OF BELT FOR PACKAGE AC

Supply of Belt used in package AC as required as per direction of EIC.

33) SI no 20.330 Description : SUPPLY OF FAN BLADES FOR PACKAGE AC

Supply of Fan blade of 24" dia 4 blades used in package AC as required as per direction of EIC.

34) SI no 20.340 Description : SUPPLY OF CABLE FOR AC

Supply of 2.5 sqmm 4 core copper cable for ACs as required as per direction of EIC.

35) SI no 20.350 Description : SUPPLY OF OUTDOOR STAND

Supply of outdoor stand with anchor fasteners for split ACs as required as per direction of EIC.

BOQ 30.10 Supervisory services for Gen Overhauling

Scope of work envisages deployment of expert foreman for supervisory services during Generator overhauling works at NTPC-Unchahar.

A. Eligibility Criteria for person to be deployed:

1. The person should have minimum experience of 20 years as Senior Foreman in NTPC approved sub vendors for generator area and worked in erection and overhauling of large turbo generators of capacity more than 200 MW.
2. Age should be below 62 Years.
3. The person should be medically fit.
4. Credentials of expert foreman shall be submitted to EIC. Deputation shall be with the approval of EIC.

B. Service conditions:

1. The deputation will be on as-and-when required basis.
2. The person should be able to move to NTPC station within two days of intimation.
3. The person should be able to work in day and night shifts.
4. There will be no separate overtime charges.
5. The candidate shall follow safety rules/ procedure applicable inside plant premises.

C. Payments & facilities:

1. Amount linked to Safety compliance : NIL.
2. Payment of ₹10,000 per day minimum of engagement including travel period shall be paid by contractor to the foreman engaged.
3. Travelling charges shall be paid as per actuals based on submission of documentary proof
4. Accommodation will be provided by NTPC in Field Hostel on free of cost basis during the period of deployment.
5. Person shall be insured during the period of work.

30.20 Travel charges – This line item is not tendered as it is reimbursement.

1. This BOQ is for paying the travel charges of the foreman deployed for Generator Overhauling works.
2. Travelling charges shall be paid on actual basis on to and fro basis. The travel fare shall be limited to economy class airfare / 2nd AC Train fare / Taxi fare by the shortest route from the place of the departure of the foreman to NTPC Unchahar and from NTPC Unchahar to the destination of foreman.
3. The departure and destination stations of the foreman shall be within India and shall be self certified by the foreman.
4. The copy of the train ticket / flight ticket along with boarding pass / taxi bill must be submitted for payment of the travel charges.
5. Measurement: Travel charges for the to and fro travel of the Foreman for one visit shall be paid on lumpsum basis subject to capping of INR 20000.00 per visit.

BOQ 40.10, Safety Execution: SASFT00GN206

- (1). Gas cylinders must not be rolled on the ground. Trolleys should be used for their transportation. All gas cylinders shall have the caps covering the nipple attachment while transportations.
- (2). Agency should provide and ensure use of PERSONAL PROTECTIVE EQUIPMENTS like helmets, safety shoes, safety belts, hand gloves, goggles, fluorescent jackets etc. for all its workmen deployed on site.
- (3). Agency shall be responsible for the SAFETY of its manpower working at site. It has to ensure that proper care has been taken in making access / while erecting scaffolding for a job. Agency shall be responsible for getting the same inspected & cleared by the authorized representative of the NTPC, prior to its use.
- (4). All workers working at a height or any other location fall from where is likely to cause injuries, must use safety belts.
- (5). Contractor has to take all safety measures during work to avoid any type of accident or unsafe condition which may lead to an accident. No loose material shall be left at height as material falling may cause serious injuries.
- (6). It shall be contractor's responsibility to keep his manpower/staff in specified work areas of the plant only, as covered under this contract. Strict action would be taken against the contractor and/ his persons if found in places other than the specified work areas and/or indulging in

unlawful activities. It is at the discretion of EIC to divert the labour from one area to another depending upon plant emergencies.

(7). In case of any safety lapses like use of untested lifting T&P, agency's workers without PPEs etc. (as pointed out by NTPC safety officer/EIC or his representative) a token penalty of Rs. 500/- per instance will be imposed on the agency. The compensation of the damages for man or machine arising out of accident will be borne by the agency on each such occasion.

(8). Any compensation in case fatal/non-fatal accident to the affected labour/staff of the agency as per the applicable laws will have to be paid by the agency.

Materials & Consumables : The supply of following material supply shall be in scope of vendor during execution of the contract.

1. Cu capillary for Hydrogen dryer
2. Welding Electrode for fabrication work & Brazing Electrode
3. Paint and primer (For Fabrication work , ACs & Hydrogen Dryer OH)
4. Hylomer Blue
5. Sealant (M seal, titanium putty, Silastic etc)
6. Pipe jointer of different sizes (1/2" , 3/8" , 5/8" , 3/4" , 1/4 " or as required) for Acs & driers.
7. AC insulation sleeve
8. Various types of Teflon glands for Valve

Special Tools: Vendor shall arrange the special tool for execution of the job, a list of tools & tackles is mentioned below:-

1. All consumables like diesel, petrol, Rustoline, Emery paper / Cotton, Markin Cloth, water / air hoses, Teflon tape, hacksaw frame with blade, brazing electrodes/ material, chemicals, soap/washing agents, torch, , CTC, WD40, cleaning cloth, PVC, adhesive tapes, PVC tapes, cotton waste, extension board with industrial socket and RCCB, material required for Gas/Electric welding/brazing, sand paper, silastic etc. and general consumables which are required for maintenance of the cooling equipment shall be arranged by the contractor at his own cost.
1. All T&Ps , general purpose tools , flaring tools , Non sparking tools for working in hydrogen area , vacuum pump for depressurization of gas ,welding machine, grinding & drilling machine, gas cutting set with DA and oxygen, gas welding sets and consumables like gas, general purpose electrodes, grinding wheel, hose pipe for air blowing or AC washing, normal ladder with 10 rungs (height around 10 ft), A type stair (height around 8 ft) to reach ACs installed at height etc, are to be provided by the agency at his own cost. This includes TIG set if required for welding.

2. All joints DP test will be carried out. DP test kit will be supplied by party. Party must ensure the usage of proper DP Kit valid in all aspects.
3. R-22 gas is very harmful to environment hence refrigerant to be drawn in empty cylinder and after that work to be done in compressor or associates lines. After completion of the work pressure testing to be done by Nitrogen filling in the system after successful completion of pressure test. Vacuum to be created upto -30 PSI in the system before charging the refrigerants this clause will be applicable in respective BOQ of contract if required.

STATUTORY REQUIRMENTS:-

1. NTPC Unchahar has got accreditation of ISO-9001, 14001, OHSAS-18001 & SA-8000. The agency has to educate and train its employees regarding above and has to fulfil all its obligations as required with regards to these accreditations.
2. Agency has to fulfil the requirement of latest version of Factory Act & Contract labour (R&A) Act. Agency must have PF code and follow all regulations and provisions of Employees PF Act.
3. Contractor must submit copy of valid labour license & insurance of 100% of it's staff.
4. Agency has to produce certified wage sheet with PF deduction for the workmen deployed during billing period & PF challan showing workmen's contribution as well as employer's contribution with each RA bill.
5. Agency has to make the payment to his staff & labour through bank before first RA bill and for this bank account of all the staff / labours are to be opened in the bank within one month of start of the contract. Agency has to submit to EIC the documentary proof of bank payment in each month.
6. All lifting T&Ps shall be tested and certified by competent person as per statutory requirements. Test certificate are to be submitted to EIC.
7. All T&Ps, safety PPEs and appliances shall be got inspected as per OHSAS-18001 guide lines / statutory requirements by safety dept. / competent person.
8. Agency has to submit following documents before start of the contract: - (a) Insurance Certificate (b) Labour Licence (as per requirement) (c) PF registration papers (d) List of T&P (e) List of PPEs (f) Receipt of PPEs from Contractors Staff. (g) Staff deployment details.

TERMS AND CONDITIONS :

1. Contractor or his authorized representative shall be available at site receiving instructions for taking up any job.
2. Contractor will provide 2 pairs of uniform clothing (Shirt-Pant) to each of workmen per year employed in the contract .
3. ASSISTANCT IN EMD STORE MANAGEMENT for BOQ 10.200 will be HSW .
4. Work is to be carried out on round the clock basis.

5. Maximum one RA bill will be processed in a month.
6. All scaffolding required for fabrication, installation & painting shall be arranged by the agency & removal thereafter. However scaffolding material will be supplied by NTPC wherever available & the same shall be returned back after completion of job.
7. Material transportation to and from stores is to be arranged by the agency at their own cost. Scrap generated during fabrication shall be stored at a location identified by Engineer-in-charge & shall be transported to central scrap yard, time to time by the agency, at his own cost.
8. For removal of old/existing structure, measured quantity shall be 25% of BOQ 10.130 for cutting, removal and transportation of steel belonging to old structure, i.e. if 4 MT of old structure is removed, then payment will be done for 1MT under BOQ 10.130
9. For BOQ 10.130 Paint, primer and thinner shall be of good quality and of standard make like Berger/Asian/Shalimar/Jenson nicolson/kansai nerolac. Colour as decided by Engineer-in-charge or area engineer.
10. The quantity indicated in B.O.Q. for each item is tentative. Actual quantity may vary to any extent depending upon work requirement. Therefore variation in individual item, during execution of contract shall be permitted to any extent with ceiling of +20% to - 20% in the overall contract value, for which no approval/ concurrence shall be taken during execution of the contract. The payment shall be made as per the quantity of BOQ executed for all item codes.
11. Party shall keep sufficient man power to engage for work at four different locations simultaneously depending on site requirement The contractor has to maintain an office in plant premises in working hours for logging of complaints. The suggested manpower for the above work is two high skilled technician, five nos. skilled technician and four nos. semi skilled technician and 2 no. helper manpower having relevant skill and experience in the similar field of running maintenance and repair of air conditioning equipments, H2 driers and water coolers. This manpower must be present on all working days of NTPC Unchahar. If any manpower found short/absent, EIC/Site incharge may impose penalty, @ 1.5 times of minimum wages of relevant manpower. If extra manpower is required to complete the job assigned, the contractor shall depute extra manpower without any extra charge.

Extra manpower to be deployed during overhauling as per the requirement.

12. The contractor shall also provide at least two mobile nos exclusively for logging of complaints & to coordinate the work. The mobile must be kept 'ON' round the clock to handle emergencies if any. If the mobile is found unattended, a penalty of Rs 200.00 per occasion will be imposed on the party. If any of the mobile is lost/stopped working, same shall be intimated to site engineer and party has to provide new mobile no. at the earliest.
13. The HSW should hold diploma certificate, SW worker should have ITI certificate or have minimum ten years of experience as fitter or in similar jobs, SSW should have ITI

certificate or minimum five years industrial experience and USW should have a 2 years of industrial experience.

14. The contractor should ensure availability of experienced manpower within one hour of information for attending emergencies if arise during Sundays, holidays & off hours. Failing to attend emergencies within 4 hours of information shall lead to a penalty of Rs. 200/-for first day & subsequently Rs. 500/- per day.
15. All consumables, chemicals, soap/washing agents, torch cell, torch, CTC, WD40, cleaning cloth, C-Shine(To be used during overhauling/servicing of ACs), PVC, adhesive tapes, PVC tapes, cotton waste, connecting wires, Oxygen Gas ,DA Gas ,material required for Gas/Electric welding/brazing, pin/ ring type copper lug of various sizes, terminal block, brass, nails, joints, nuts and bolts of various sizes, sand paper, etc. and general consumables which are required for maintenance of the cooling equipment shall be arranged by the contractor at his own cost.
16. All the scrap generated will have to be disposed by the party at designated location as directed by Engineer in-charge failing which NTPC shall impose penalty of Rs 500.00 per instance.
17. Payment for all BOQ will be made as per BOQ quantity executed. Hence party has to maintain proper record for all BOQ quantity executed. The party shall also maintain record of spare parts consumption.
18. The contractor has to arrange the entire infrastructure required at the site for the overhauling/ repairing/ servicing/ commissioning of equipment and carrying of defective equipment from site to workshop and back on his own.
19. Wherever the units are fenced, removal of fencing/opening of fencing door for carrying out the job and re-fencing it properly shall be done and ensured by the contractor free of cost.
20. The contractor shall maintain printed job card book having serial no/book no. on his own cost. Each job card in duplicate shall be filled up with details of job attended duly signed by user. One copy of this job card is to be submitted with daily report. The contractor shall prepare the abstract of the equipment attended and unattended for each day and submit it to the E-I-C/site engineer daily.
21. Proper housekeeping of cooling equipment will be in the scope of the party. This includes shifting of equipment from one place to other and handing over of damaged components/ equipment to a location as decided by EIC/site engineer without any extra cost payable to the party.
22. Any material supplied by the party must be new with proper bill (with valid GST No. on the bill) from dealer/agency along with warranty. The bill & warranty is to be handed over to NTPC Ltd.
23. Defect liability period for BOQ no 10.70,10.80, 10.90, 10.100, 10.110, 10.120 , 10.140 and 10.220 will be three months , for BOQ no 10.50 will be two months and for 10.160 will be 1 month. If any type of defect/ breakdown (including gas leakage) is reported within defect liability period in the same equipment, the party shall attend the defect free of cost.

24. Defect liability period for the new supplied compressors and window AC body, split AC indoor and outdoor body through supply part (through BOQ No. 20) shall be one year from the date of supply. The defect liability period for other material supplied through supply part (through BOQ No. 20) shall be six months. In case of failure of any material during above defect liability period, contractor has to replace it with new one without any extra cost payable to the contractor.
25. Replacement/ re-installation carried out for the purpose of maintenance will be in the scope of attend defect and it will not be considered as the work of installation, testing and commissioning.
26. The contractor shall handover all the units/materials in running/healthy condition, at the end of the contract period before finalization of contract.
27. Replacement/ re-installation carried out for the purpose of maintenance will be in the scope of attend defect and it will not be considered as the work of installation, testing and commissioning.
28. All the defective/damaged parts replaced with new one will be the property of NTPC Ltd. And will not be handed over to the contractor.
29. Contractor should have valid electrical licence from any state on the date of bid opening. However, the contractor need to get it either endorsed or obtain fresh "A" Class electrical licence from Uttar Pradesh Electrical Inspectorate prior to start of work, in case of contract is awarded to them.
30. Depending upon requirement, contract period may be extended for three months. If required contract may be short closed by NTPC by giving notice of one month.
31. All other terms and conditions will be as per GCC of NTPC Ltd.
32. PERIOD OF CONTRACT: Two Years from the date of start of contract, The Contract may be extended for a period upto three (3) months on same Terms and Conditions of the Contract. Engineer-In-Charge (EIC) reserves the right to foreclose the Contract before completion of extended time period.
33. In case minimum wages are revised, the rate will be subject to price adjustment. All adjustment in the rate/price shall be computed in accordance with the formula detailed hereunder:

PVC Clause- Applicable

Price Escalation Formulae:

A.PVC formula as per USSC Circular 174 shall be **applicable** (for all items except covered under B below)

$$E1 = E0 [0.30 + 0.70 \times W1 / W0]$$

Where, **E1** = Adjusted Value

E0 = Original award value/ Awarded price of BOQ Line Item(s)

W1 = Revised Minimum Wages for USW (Unskilled Manpower) applicable as on date of Service/ Execution (as per notification by the appropriate Govt.)

W0 = Minimum Wages of USW (Unskilled Manpower) applicable as on seven (7) days prior to the last date of submission of Bids (Price Bids)

B. Note: Price Variation clause is not applicable to hiring of Vehicles like Tractor Trolley/JCB/Crane/Hydra etc , Reimbursements **(30.20)** & supply of items if any (**item 20.10 to 20.350**). Also PVC not applicable for DSR Items and **Deployment of Engineer (item 30.10)**.