

**ANNUAL OVERHAULING FY-25  
MAITHON POWER PLANT  
UNIT#2  
Capacity:-525 MW  
Shut down period:-24 Days.**

<b>Sl no.</b>	<b>Job</b>	<b>Quantity</b>
<b>01</b>	<b>Servicing of PA/FD fan without replacement of rotor</b>	<b>02</b>
<b>02</b>	<b>Replacement of rotor assembly of PA/FD fan by serviced/spare rotor</b>	<b>02</b>
<b>03</b>	<b>Servicing of PA fan rotor assembly at site</b>	<b>01</b>
<b>04</b>	<b>Servicing of FD fan rotor assembly at site</b>	<b>01</b>
<b>05</b>	<b>Fan motor replacement</b>	<b>02</b>
<b>07</b>	<b>Complete Overhauling of ID Fan and Lube oil system.</b>	<b>02</b>

**GENERAL CONDITION OF CONTRACT**

1. All Government statutory HR/IR requirements required to carry out the overhaul jobs as well as for gate pass process will be in the scope of the bidder.
2. Prebid discussion will be arranged at MPL site. Bidder shall participate to understand the job scope and sign pre-bid MOM. Without site visit and attending pre-bid discussion, bidder shall not be considered for the contract. Bidder should also understand the existing Gate pass and training formalities at MPL during site visit.
3. Bidder shall mobilize at least 07 days in advance from Overhaul zero date for HR/IR and gate pass Formalities, safety orientation, TPSDI L1/L2 training, Inspection of safety PPE, tools, statutory compliances and pre-outage works. Complete manpower must be deployed before Outage zero date. Deployed manpower should not demobilize the site without the permission of MPL EIC.
4. Job will be carried out round the clock basis.
5. Safety and Quality to be strictly followed as per MPL standard practice. All PPE's to be provided by Contractor. Penalty is applicable for Safety/ HR rules violation as per MPL standards. Typical safety observations related to job, PPE's, housekeeping, electrical observations etc. should not take place. Otherwise, it may attract penalty deduction as per contract terms.
6. Bidder must comply with the observations raised regularly by Safety Department and concerned engineers on a day-to-day basis. Penalty shall be applicable for noncompliance.
7. Minimum 1 Safety supervisor is required Approved by MPL Safety head shall be deployed for the entire duration of job. He will closely monitor the work and report to MPL EIC/ Safety Department.
8. Bidder shall submit Daily progress report to EIC and concerned MMD engineers regularly.
9. Bidder's Engineers/ Foreman/ workmen who will be working in critical areas need to be interviewed and approved for work in overhaul by MPL. This is to be completed before overhaul commencement.
10. The bidder shall deploy adequate machinery and resources, in terms of number and skill, for carrying out the work under the order.
11. If the bidder decides to sublet any part of job to other agency, prior approval needs to be taken from MMD EIC. No other agency shall be allowed on site without prior approval.
12. All tools and tackles and consumables required to carry out the work is in Bidder's scope, (As per example) but not limited to.
  - a. Slings, D shackles, Chain pulley block, spanners, Hydraulic Jack 100 T & 50 T capacity (Suitable for BHEL supplied Fan Overhauling) shall be in the scope of the bidder. Lifting Tools and tackles to be certified by Approved Competent third-party.
  - b. All the tools which required for the dismantling of fan casing, coupling, blade, motor foundation bolts & for lube oil system are to be in good condition & sufficient quantity.

- c. Welding machine (with ELCB, sufficiently long cables and industrial plugs to fix on the sockets), grinding/cutting machine, Gas cutting sets with flash back arrestors, lighting fixtures, board, cable etc. shall be in vendor scope, All are in good condition & same has to be inspected & approved by MPL
  - d. Consumables such as cotton waste, hand gloves, hacksaw blades, emery tape/paper, grinding wheels, lapping paste, Teflon tape, silicon sealant, Prussian blue, **WD-40**, **Molycoat Grease**, paint remover, painting brushes, wire brushes, scrapers, Hydraulic pump (for LOP cooler hydro test), fixtures for LOP Cooler Hydrotest etc. is in bidders' scope.
13. **Bidder should ensure deployment of skilled work force like Engineer, Supervisor, Mill wright fitter, junior fitter, welder, gas cutter & helper for the overhauling of Axial blade pitch-controlled fan & Radial fans with journal bearing arrangement having prior experience of similar type & capacity of fans.**
  14. Bidder shall ensure strict housekeeping of work area on DAY TO DAY basis, all unwanted scrap material to be shift from site to identified location/scrap yard
  15. Post completion of shutdown, critical manpower as asked by MPL EIC must stay up to 3 days after synchronization or till plant reaches stable load condition.
  16. Defect liability period for overhauling jobs shall be up to 12 months from the date of completion of overhauling activity. Any part found defective during this period, as consequence of bad workmanship shall be repaired, free of cost, by the vendor. Contractor shall report within 2 days from the date of intimation by the Order manager to attend the defect.

#### **PENALTY**

Following penalties will be imposed.

17. Its responsibility of bidder to maintain strict quality of job, if any types of failure/abnormalities like leakages from joints, vibration etc. same must be rectified by bidder as well as penalty up to 15% of order value will be imposed.

#### **GENERAL REQUIREMENTS**

18. Physical verifications of the Lifting Tools & Tackles to be done by MPL EIC along with MPL Safety I/C. Rejection of defective elements with definite Color codes. Accepted tools also will be Color coded as per standard.
19. Load test certificate of the lifting tools & tackles by Government approved/MPL registered Vendor to be obtained.
20. All required T&P, welding m/c, gas cutting, grinding, Hydraulic jack, lifting tools and tackles shall be in vendor scope.

## **JOB SCOPE For - Servicing of PA/FD fan without replacement of rotor with Lube Oil System.**

FAN MAKE - BHEL  
FAN MODEL (PA Fan)-AP2-20/12  
FAN MODEL (FD Fan)-AP1-26/16

Fan Overhauling & replacement of rotor from position and place same rotor assembly in position and perform following jobs of fan. Detailed job scope follows following activities-

1. Complete initial inspection of fan internals by opening of manhole door from duct side and fan enclosure and mark general observation and any specific observation before dismantling of fan internals.
2. Preparation of scaffolding in the Fan suction side up to silencer level for cleaning of the suction silencer and inlet duct.
3. Cleaning of the foundation at the bottom of the fan casing to be done thoroughly to remove any insulation, ash and oil traces.
4. Taking of initial reading of blade tip clearance between casing & blade tip.
5. Removal of motor enclosure, De coupling of fan motor & take initial alignment reading of fan.
6. Dismantling & removal of fan top casing, dismantling of all associates oil piping.
7. Complete cleaning of top & bottom casing and DP test of all welding joints of casing.
8. All blades to be marked before dismantling. Then removal of each blade from its position and followed by cleaning of blade foot and blade rotation area. All blades to be dipped in diesel for overnight same must clean by using soft cotton waste /cloth. Rectangular ring to be clean separately then it fit and ensure free movement of ring in blade foot ring groove. after cleaning and drying to be checked by DP test method and to be shown to MPL EIC. Checking of each blade foot and tip area by DP test to ensure no damages or crack in blade foot and tip.
9. Removal of impeller and Rotor assembly from position and placing it beside the foundation over stand. Cleaning of the Impeller and Bearing Housing and check for any leakages and defects.
10. After removal of impeller from casing complete cleaning of bottom casing and DP test to be done on weld joint of bottom casing and inspection bearing housing seating surface and correct if any irregularities observed.
11. Check casing foundation bolt tightness and spring back (**soft footing**) of foundation and if any deviation observed rectification to be done by blue matching and shimming in foundation base plate & bottom casing, this may require jacking or lifting of bottom casing also.
12. Installation of the checked impeller & rotor assembly in bottom casing and check fitment clearance with respect to rotor assembly. Fixing of all fan blades as per sequence and torqueing on each bolt as per OEM guidelines.
13. Tightness and torqueing of all the bolts of impeller and bearing housing as per OEM guidelines and standard.
14. All the blade to be fix on impeller as per sequence marking and orientation wise with proper torqueing as per standard OEM guidelines.

15. Checking of all thread fittings and refitting by applying fresh new Teflon tape & silicon sealant to ensure no oil leakage from joints.
16. All connection of servo assembly ensure no oil leakage and cleaning and servicing of servo link assembly fixed bearing and all linkages tightness and free movement. Blade pitch mechanism to be completely checked and serviced.
17. All the 5 pins starting from Actuator Head to Servo Hub to be checked for any clearances and same to be rectified by machining, drilling and preparation of new pin at workshop.
18. Checking of Servo assembly stroke and calibrate the stroke movement as per MPL engineer's guidelines. Servo stroke checking and fine-tuning of blade pitch with respect to actuator command.
19. Removal /replacement of fan motor coupling may require for this activity. Coupling removal frame to be made at site, for the measurement of shaft outside micrometer/ inside micro meter (150 - 300) for shims 0 – 25 mm outside micro meter to be under bidder scope. **Coupling shall be inserted only by heating in Oil tub.** Oil shall be provided by MPL, however tub and heating arrangements to be done by bidder. Heating shall be carried out only in presence of MPL fire department.
20. Fan- motor coupling alignment- before start of coupling alignment, rotor centering with respect to motor and rotor leveling completed and then alignment to be done. And coupling alignment must ensure within standard/acceptable reading limit. This may requires lifting of motor and correction of base plates by grinding, for the required blue matching alignment reading must be within acceptable range and witness by concern MPL engineer. And completion of all final coupling to be done.
21. Placement of top casing and check all the internal clearance readings blade top clearance, internal clearances, end cover gap, clearance of blade tips, blade root and boss gap, and if any deviation observed in the reading from standard limits if required rectify as per OEM guidelines and standard
22. Any other jobs not mentioned herein, but required for the completion of work, must be execute properly, and Assistance for Trial run and attending to defects, if any.
23. **The Suction and discharge bellows of PA fans and FD Fan are planned to be changed with rubberized fabric type or modified rubber bellow type. In case of Rubberized fabric type, the bidder is required to dismantle the existing bellow, then fix the rubberized fabric bellow by making holes at appropriate distance and fixing with existing nut and bolts and clamping in the upper half of casing. In case of modified Rubber bellow the bidder is required to dismantle the existing bellows, then fit up and weld the additional flange on casing under the guidance of Bellow supplier and assist in fixing of the modified type rubber bellow. Any other activity required for the replacement of existing Bellow with modified/new type bellow is in Bidder's scope.**

**General servicing of Lube oil system -** Fan Lube oil system Overhauling considered complete lube oil system cleaning, inspection and servicing of associate equipment's like Lube Oil Pumps, oil Coolers, Oil filters. Oil piping's, oil skid enclosure, oil tank, accumulators etc. Complete cleaning of lube oil system, enclosure, piping and surrounding area and foundation.

24. Complete Cleaning and servicing of lube oil system components like lube oil pumps, complete cleaning of lube oil tank internals, oil filters, lube oil coolers cleaning and hydro test, and all

pipelines and gauge glasses. Oil hoses inspection for any oil leakage and replacement if required, draining of oil from lube oil tank & same oil to be filled in (servo prime 68) barrel only.

25. Overhauling of the LOP to be done and replacement of Mechanical Seals and Bearings to be done.
26. For the servicing of shell and tube type oil cooler, individual tube to be clean by ½ inch nylon wired straight brush inserted in each tube and clean by brushing and water jet cleaning. After cleaning, both end cooler face to be clean and gasket seating surface cleaning by scraping and with emery paper for proper sealing, to avoid oil-water leakage. After cleaning cooler hydro test to be performed and to be tested on 10 Kg pressure holding with minimum 01 hrs. Fixtures required for the Hydrotest are in Bidder's scope.
27. All oil filters must be cleaned with diesel/petrol and after cleaning with diesel air blowing and drying properly. Lube oil pump completely dismantling and internal inspection to be done and after inspection oil seal & bearing replacement to be done based on condition. And final box up with proper leveling and alignment.
28. All discharge & suction line to be removed from its position, cleaning of line to be done by nylon wire brush after that pressurized air blow to be done.
29. Modification of line to be required in suction & discharge line threaded joint union to be modified by flange type joints, Gauge glass modification of oil tank to be done instead of body type mounted. The required flanges & gauge glass will be provided by MPL.
30. During fixing of the line if stress occur in the suction & discharge line same has to rectify by cutting & re- welding of the line as per requirement.
31. Replacement of all joint gaskets and seals. Attending all leakages of oil and water circuit. Servicing of pressure relief valves and replacement, if required. Oil inlet & return dismantling & cleaning by air and all lube oil flange joint gaskets will be replaced.
32. Assistance for Trial run and attending to defects, if any.

**Job Scope for: - Replacement of rotor assembly of PA/FD fan by serviced/spare rotor.**

FAN MAKE - BHEL  
FAN MODEL (PA Fan)-AP2-20/12  
FAN MODEL (FD Fan)-AP1-26/16

Fan Overhauling & replacement of rotor from position and placed spare overhauled rotor assembly in position and perform following jobs of fan. Detailed job scope follows following activities-

1. Complete initial inspection of fan internals by opening of manhole door from duct side and fan enclosure and mark general observation and any specific observation before any dismantling of fan internals.
2. Preparation of scaffolding in the Fan suction side up to silencer level for cleaning of the suction silencer and inlet duct.
3. Cleaning of the foundation at the bottom of the fan casing to be done thoroughly to remove any insulation, ash and oil traces.
4. Decoupling of fan-motor, take initial alignment reading of fan and then decouple.

5. Taking of initial reading of blade tip clearance between casing & blade tip.
6. Dismantling and removal of fan top casing, dismantling of associate oil piping, connection hoses and other equipment's.
7. All blades to be marked before dismantling. Then removal of each blade from its position and followed by cleaning of blade foot and blade rotation area. All blades to be dipped in diesel for overnight same must clean by using soft cotton waste /cloth. Rectangular ring to be clean separately then it fit and ensure free movement of ring in blade foot ring grove. after cleaning and drying to be checked by DP test method and to be shown to MPL EIC. Checking of each blade foot and tip area by DP test to ensure no damages or crack in blade foot and tip.
8. Removal of impeller and Rotor Housing from position and after removal of impeller from casing complete cleaning of bottom casing and DP test to be done on weld joint of bottom casing and inspection bearing housing seating surface and correct if any regularities observed.
9. Check casing foundation bolt tightness and spring back (**soft footing**) of foundation and if any deviation observed rectification to be done by blue matching and shimming in foundation base plate & bottom casing, this may require jacking or lifting of bottom casing also.
10. Installation of services/spare rotor assembly in bottom casing and check fitment clearance with respect to rotor assembly.
11. Fixing of all fan blades as per sequence and torquing on each bolt as per OEM guidelines.
12. Tightness and torquing of all the bolts of impeller and bearing housing as per OEM guidelines and standard.
13. Checking of all thread fittings and refitting by applying fresh new Teflon tape & silicon sealant to ensure no oil leakage from joints.
14. All connection of servo assembly ensure no oil leakage and cleaning and servicing of servo link assembly fixed bearing and all linkages tightness and free movement. Blade pitch mechanism to be completely checked and serviced.
15. All the 5 pins starting from Actuator Head to Servo Hub to be checked for any clearances and same to be rectified by machining, drilling and preparation of new pin at workshop.
16. Checking of Servo assembly stroke and calibrate the stroke movement as per MPL engineer's guidelines. Servo stroke checking and fine-tuning of blade pitch with respect to actuator command.
17. Removal /replacement of fan motor coupling may require for this activity. Coupling removal frame to be made at site, for the measurement of shaft outside micrometer/ inside micro meter (150 -300) for shims 0 – 25 mm outside micro meter to be under bidder scope. **Coupling shall be inserted only by heating in Oil tub**. Oil shall be provided by MPL, however tub and heating arrangements to be done by bidder. Heating shall be carried out only in presence of MPL fire department.
18. Fan- motor coupling alignment- before start of coupling alignment, rotor centering with respect to motor and rotor leveling completed and then alignment to be done. And coupling alignment must ensure within standard/acceptable reading limit. This may requires lifting of motor and correction of base plates by grinding, for the required blue matching alignment reading must be within acceptable range and witness by concern MPL engineer. And completion of all final coupling to be done.

19. Placing of top casing and check all the internal clearance readings blade top clearance, internal clearances, end cover gap, clearance of blade tips, blade root and boss gap, and if any deviation observed in the reading from standard limits if required rectify as per OEM guidelines and standard.
20. Any other jobs not mentioned herein, but required for the completion of work, must be execute properly, and Assistance for Trial run and attending to defects, if any
21. **The Suction and discharge bellows of PA fans and FD Fan are planned to be changed with rubberized fabric type or modified rubber bellow type. In case of Rubberized fabric type, the bidder is required to dismantle the existing bellow, then fix the rubberized fabric bellow by making holes at appropriate distance and fixing with existing nut and bolts and clamping in the upper half of casing. In case of modified Rubber bellow the bidder is required to dismantle the existing bellows, then fit up and weld the additional flange on casing under the guidance of Bellow supplier and assist in fixing of the modified type of rubber bellow. Any other activity required for the replacement of existing Bellow with modified/new type bellow is in Bidder's scope.**

**General servicing of Lube oil system** - Fan Lube oil system Overhauling considered complete lube oil system cleaning, inspection and servicing of associate equipment's like Lube Oil Pumps, oil Coolers, Oil filters. Oil piping's, oil skid enclosure, oil tank, accumulators etc. Complete cleaning of lube oil system, enclosure, piping and surrounding area and foundation.

1. Complete Cleaning and servicing of lube oil system components like lube oil pumps, complete cleaning of lube oil tank internals, oil filters, lube oil coolers cleaning and hydro test, and all pipelines and gauge glasses. Oil hoses inspection for any oil leakage and replacement if required, draining of oil from lube oil tank & same oil to be filled in (servo prime 68) barrel only.
2. Overhauling of the LOP to be done and replacement of Mechanical Seals and Bearings to be done.
3. For the servicing of shell and tube type oil cooler, individual tube to be clean by ½ inch nylon wired straight brush inserted in each tube and clean by brushing and water jet cleaning. After cleaning, both end cooler face to be clean and gasket seating surface cleaning by scraping and with emery paper for proper sealing, to avoid oil-water leakage. After cleaning cooler hydro test to be performed and to be tested on 10 Kg pressure holding with minimum 01 hrs. Fixtures required for the Hydrotest are in Bidder's scope.
4. All oil filters must be cleaned with diesel/petrol and after cleaning with diesel air blowing and drying properly. Lube oil pump completely dismantling and internal inspection to be done and after inspection oil seal & bearing replacement to be done based on condition. And final box up with proper leveling and alignment.
5. All discharge & suction line to be removed from its position, cleaning of line to be done by nylon wire brush after that pressurized air blow to be done.
6. Modification of line to be required in suction & discharge line threaded joint union to be modified by flange type joints, Gauge glass modification of oil tank to be done instead of body type mounted. The required flanges & gauge glass will be provided by MPL.
7. During fixing of the line if stress occur in the suction & discharge line same has to rectify by cutting & re- welding of the line as per requirement.
8. Replacement of all joint gaskets and seals. Attending all leakages of oil and water circuit. Servicing of pressure relief valves and replacement, if required. Oil inlet & return dismantling & cleaning by air and all lube oil flange joint gaskets will be replaced.
9. Assistance for Trial run and attending to defects, if any.

### **Job scope for: - Servicing of PA fan rotor assembly at site**

This is optional job which may be executed during Shutdown:-

For the Rotor and servo assembly servicing at site during overhauling, party should mobilize expert at site and rotor to be serviced in presence of MPL Engineer only. Party should take prior concurrence from MPL MMD for performing the job.

1. Dismantling of rotor assembly as per OEM guidelines and take all the reading of total axial float, hydraulic torque pressure of rotor loosening and same to be maintain while tightening or as per standard, take shaft and bearing clearances. Cleaning of all internals of bearing housing and bearing seating surface.
2. Assembly of rotor to be done as per standard procedure and maintain all readings and clearance while rotor assembly and maintain rotor total float.
3. Rotor leak test to be done and ensure complete cleaning of blade linkages and fresh grease to be apply on blade seal and linkages. Tightness and torquing of all the bolts of impeller and bearing housing as per OEM guidelines and standard. After complete rotor servicing place, place this rotor in casing and ensure proper tightening of bearing housing in rotor. check casing and rotor clearance and rectify by shimming if clearance observed.
4. All rotor fasteners to be tightened properly as per standard and same to be rechecked after assembly to avoid any looseness of fasteners during running condition of fans.

### **Job scope for: - Servicing of FD fan rotor assembly at site**

This is optional job which may be executed during Shutdown:-

For the Rotor and servo assembly servicing at site during overhauling, party should mobilize expert at site and rotor to be serviced in presence of MPL Engineer only. Party should take prior concurrence from MPL MMD for performing the job.

1. Dismantling of rotor assembly as per OEM guidelines and take all the reading of total axial float, hydraulic torque pressure of rotor loosening and same to be maintain while tightening or as per standard, take shaft and bearing clearances. Cleaning of all internals of bearing housing and bearing seating surface.
2. Assembly of rotor to be done as per standard procedure and maintain all readings and clearance while rotor assembly and maintain rotor total float.
3. Rotor leak test to be done and ensure complete cleaning of blade linkages and fresh grease to be apply on blade seal and linkages. Tightness and torquing of all the bolts of impeller and bearing housing as per OEM guidelines and standard. After complete rotor servicing place, this rotor in casing and ensure proper tightening of bearing housing in rotor. check casing and rotor clearance and rectify by shimming if clearance observed.
4. All rotor fasteners to be tightened properly as per standard and same to be rechecked after assembly to avoid any looseness of fasteners during running condition of fans.



**Fan Motor replacement** – This is optional job including below mentioned activities.

1. Motor enclosure to be removed from its position & same to be shifted from site to identified location (near chimney area)
2. For the removal of motor from its position bidder to arrange lifting tools & tackles considering lifting load capacity 14T. D Shackles & Short Sling of suitable length to accommodate inside the gap between Motor and EOT Lifting Hook to be arranged by Bidder. Same to be checked during pre-bid visit.
3. After decoupling of fan motor, arrange lifting arrangement and lift motor from position and lowering to ground level and then shifting to designated place as per instruction by EIC.
4. For the removal/replacement fan motor coupling require following measuring tools, coupling removal frame to be made at site, for the measurement of shaft outside micrometer/ inside micrometer (150 -300) for shims 0 – 25 mm outside micrometer to be under bidder scope
5. **Coupling shall be inserted only by heating in Oil tub.** Oil shall be provided by MPL, however tub and heating arrangements to be done by bidder. Heating shall be carried out only in presence of MPL fire department.
6. Shifting of Spare serviced motor to fan area and positioned the spare motor on foundation and base tightening to be done by ensuring proper blue matching of serviced motor with respect to base plate. After motor base blue matching and base tightening give clearance for the Motor uncouple trial and motor performance checked by Condition monitoring department if performance of motor is not satisfactory motor will be again replaced by spare/serviced motor, and after successful uncouple trial clearance from MPL- CBM motor alignment and further maintenance work on motor end to be complete.
7. After completion coupling enclosure/shed of motor to re fix in its position.

**Job scope for:- Complete Overhauling of ID Fan and Lube oil system.**

*(Overhauling of IGV is not in the scope of this contract)*

FAN MAKE	-	BHEL
FAN MODEL	-	NDZV – 47 S
FAN TYPE	-	RADIAL FAN
QTY	-	02

1. Complete cleaning and inspection checking of fan internals, conical cover, and impeller seal, impeller locking and repair and replacement if required.
2. Checking of impeller weld joints by DPT for cracks inspection and rectify if required. Internals repairing of fan casing and support. **Impeller blade thickness checking, Shroud plate DP and thickness checking to be done.**
3. **ID Fan shaft soundness to be checked by UT at both sides. UT is in the scope of Bidder.**
4. Impeller clearance and Gap checking and correction if required.
5. Inspection and servicing of bearings – Fan drive and non-driving end only. The Bearing is DOGE make water cooled size – 10” RTL. Dismantling journal bearing assembly, cleaning of oil groves and check bearing cooling water system.

6. **Bearing liner to be checked by DPT & UT. UT shall be in the scope of the bidder.**
7. Measurement of bearing dimensions, clearances and oil clearances, DP test of bearing seating, housing and if deviation found replacement of bearing based on condition.
8. All cooling water flexible hose as well as lube hose to be checked & tightened properly by providing Teflon tape as well as silicon sealant to avoid any leakages. To be replaced if required
9. Coupling and coupling pad inspection and coupling alignment checking and correction.
10. Coupling rubber pad to be shift towards fan drive side from its actual position for the taking of uncouple motor trial after trial run same has to placed in its position & fix the end cover of coupling.
11. ID fan motor cooler cooling line bellows shall be replaced. Motor shed also to be modified by flange type instead solid support.
12. Motor enclosure/shed to be removed from its position & kept near chimney area.
13. Motor cooler to be removed & shifted to maintenance bay for its cleaning, inspection & hydro test.
14. **Inspection and servicing of motor bearings** – The Bearing is DOGE make size – 8” RTL. Dismantling journal bearing assembly, cleaning of oil groves and take measurement of bearing dimensions, clearances and oil clearance, DP test of bearing seating, housing and if deviation found replacement of bearing based on condition. **Bearing liner to be checked by DPT & UT. UT shall be in the scope of the bidder.**
15. Any other jobs not mentioned herein but required for the completion of work. Assistance for Trial run and attending to defects, if any.

**General servicing of Lube oil system** - Fan Lube oil system Overhauling considered complete lube oil system cleaning, inspection and servicing of associate equipment's like Lube Oil Pumps, oil Coolers, Oil filters. Oil piping's, oil skid enclosure, oil tank, accumulators etc. Complete cleaning of lube oil system, enclosure, piping and surrounding area and foundation.

1. Complete Cleaning and servicing of lube oil system components like lube oil pumps, complete cleaning of lube oil tank internals, oil filters, lube oil coolers cleaning and hydro test, and all pipelines and gauge glasses. Oil hoses inspection for any oil leakage and replacement if required, draining of oil from lube oil tank & same oil to be filled in (servo prime 68) barrel only.
2. For the servicing of shell and tube type oil cooler, individual tube to be clean by ½ inch nylon wired straight brush inserted in each tube and clean by brushing and water jet cleaning. After cleaning, both end cooler face to be clean and gasket seating surface cleaning by scraping and with emery paper for proper sealing, to avoid oil-water leakage. After cleaning cooler hydro test to be performed and to be tested on 04 Kg pressure holding with minimum 01 hrs.
3. All oil filters must be cleaned with diesel/petrol and after cleaning with diesel air blowing and drying properly. Lube oil pump completely dismantling and internal inspection to be done and after inspection oil seal & bearing replacement to be done based on condition. And final box up with proper leveling and alignment.

4. All discharge & suction line to be removed from its position, cleaning of line to be done by nylon wire brush after that pressurized air blow to be done.
5. Modification of line to be required in suction & discharge line threaded joint union to be modified by flange type joints, Gauge glass modification of oil tank to be done instead of body type mounted. The required flanges & gauge glass will be provided by MPL.
6. During fixing of the line if stress occur in the suction & discharge line same has to rectify by cutting & re- welding of the line as per requirement.
7. Replacement of all joint gaskets and seals. Attending all leakages of oil and water circuit. Servicing of pressure relief valves and replacement, if required. Oil inlet & return dismantling & cleaning by air and all lube oil flange joint gaskets will be replaced.
8. Assistance for Trial run and attending to defects, if any.

**Typical Critical skill distribution as under for above mentioned work scope**

Sl. no	Man Power	Nos.
01	Mill Wright Fitter	04
02	Fitter/ Technician	02
03	Grinder	02
04	Rigger	16
05	Welder & Gas cutter	02

***Note- For all payment purpose actual quantity executed under item will only be considered***

*If fan impeller assembly to be overhauled at the time of overhauling party should arrange to depute fan Expert during overhauling.*