

Annual Operation & Maintenance
Contract for Preventive, Predictive & Breakdown Maintenance of
220/132/33kV J K Nagar AIS /GIS Grid Substation
Activities in IPCL for 12 Months period

The entire scope of Work as noted below is the least but not minimum. Any other jobs that seems to be fit and technically required to maintain the upkeepment of the system, shall be considered within the scope as stipulated by the In charge / authorised Engineer of IPCL.

1. Routine maintenance of all Outdoor Equipment's & Accessories of 220kV, 132kV & 33kV yard as per Preventive Maintenance Schedule approved by IPCL under supervision of IPCL Engineer.
2. Routine maintenance of all Indoor Equipment's & Accessories inside Control Room building as per Preventive Maintenance Schedule approved by IPCL under supervision of IPCL Engineer.
3. Working on Overhead system of Outdoor yard including the high bus arrangement, gantry, Tower & equipment structure of 220kV, 132kV and 33kV yard for any maintenance or breakdown job. The deputed personnel must have the capacity to work in that height safely without any prejudice.
4. The deputed personnel must have the knowledge of the basic electrical system and network of the yard to understand the scope of work before starting any scheduled or breakdown job.
5. All personnel must adhere to all the statutory safety guidelines stipulated by IPCL & Govt. safety norms. Zero tolerance to the non-compliance of that guideline to be ensured.

6. Providing required assistance to IPCL Testing Team during preventive health check-up & testing of Equipment's & Breakdown normalization.
7. Whenever required by GIS Engineer, Providing required assistance to GIS Engineer during preventive health check-up & testing of Equipment's & breakdown normalization
8. Cleaning & up keeping of all Indoor equipment's like Panels, Battery, and Charger etc. including GIS Room & GIS Equipment. Cleaning & de-weeding of entire 220kV /132kV / 33kV switchyard areas including cable Trench route etc. and inside sub-station area.
9. To help & assist the Supervising Engineer for proper documentation & filing of the drawings etc. after completion of respective job.
10. To assist IPCL Engineers to record various equipment's data from the Field /yard on regular basis as guided by the substation In-charge as per the system invoke.
11. Any other activities within the substation area as deemed fit and as advised by the substation In-charge or Admin In-charge of J K Nagar for betterment of the substation to maintain its uptime and healthiness.
12. The entire Team must stay nearby to the J K Nagar substation area so that all of them can be made available within an hour at J K Nagar substation during exigency and breakdown. They have to arrange their accommodation etc. of their own for the above.
13. The entire Team of manpower will be governed by the J K Nagar Station Incharge / IPCL authorised Engineer and a roster will be prepared to ensure availability of manpower for 24 hrs. round the clock as per system requirement. The said roster shall be reviewed /revised from time to time and approved by IPCL based on the site requirement.

14. Man-Power Matrix:-

Manpower	Morning	Evening	Night	General	Total
Supervisor	-	-	-	1	1
Technician	1	1	1	5	8
Grand Total in Man-Head					9

Before selection and deployment in the Team, all the personnel of the Contractor will be interviewed by IPCL to check for their work experience, efficacy and profile matching with the requirement of job scope. After inclusion, their performance will be reviewed by IPCL every three months to check for the suitability to allow them to continue in the defined role.

14.1 Supervisor :-

One Supervisor, Minimum Experience of Supervisor for Diploma 8 years and for BE/B Tech 5 Years, directly in 220kV and above AIS/GIS substation and having Electrical Supervisory License from Directorate of Electricity, Govt. of West Bengal as a statutory requirement shall supervise all the preventive and breakdown maintenance activities of Substation jobs.

14.2 Skilled Technician:-

8 Skilled Technician/ day, minimum qualification for ITI with 5 years EHV experience and for Non-ITI with 10 years EHV experience, directly in 220kV and above AIS/GIS substation. All technicians must be capable of working on Overhead system of Outdoor yard including the high bus arrangement, gantry, Tower, conductor & equipment structure of 220kV, 132kV and 33kV yard for any maintenance or breakdown job. The deputed personnel's must have the capacity to work in that height safely without any prejudice

15. Routine maintenance job as per below mentioned job scope details :

SI No	Job Type	UoM	Job details	Remark
1	Transformer Special Oil test from IPCL approved NABL accredited Lab Once in a Yearly	Lump Sum	a. Acidity b. PPM c. Tan Delta d. Resistivity e. Sludge Content	Test should be done as per schedule provided by Officer In-Charge and test report should be provided to us
2	Mechanical Equipment Calibration from IPCL approved NABL accredited Lab Once in a Yearly	Lump Sum	a. Calibration of 5 Ton EOT Crane b. Carriage structure c. Line Trolley Hand Operated Type d. Chain Pully Block – 3 Ton	Test should be done as per schedule provided by Officer In-Charge and test report should be provided to us
3	125 KVA Diesel Generator Monitoring from IPCL approved NABL accredited Lab Once in a Yearly	Lump Sum	a. 125 KVA DG Stack Gas Analysis b. Noise Level Monitoring	Test should be done as per schedule provided by Officer In-Charge and test report should be provided to us

16. Other job scope as on when requirement basis as follows :

SI No	Job Type	UoM	Job details	Proposed Rate	Remark
1	Oil Filtration for Transformer	Ltr	a. Oil Filtration for Transformer (Minimum oil volume 27000 Ltr)		Rate for Oil Filtration need to be furnished separately and will be valid for entire AMC period. This will be paid Extra as per actual quantity execution.

	Transformer Oil DGA Test	EA	b. Transformer Oil DGA Test.		For Transformer Oil DGA Test, Test should be done as per schedule from NABL accredited Lab provided by Officer In-Charge and test report should be provided to us This will be paid Extra .
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17. LIST OF INSTRUMENTS in contractor Scope :

1. Digital/Motorized Insulation Tester 2.5 KV Make Megger
2. Digital/Motorized Insulation Tester 5 KV Make Megger
3. Digital Megger 500 V/1 KV Make Megger
4. Digital/Motorized Earth Resistance Tester
5. Millimeter (Digital)
6. Phase Sequence meter
7. Tong Tester/Clamp meter/Multimeter

18. LIST OF Tools in contractor Scope :

1. Tool Bag for each Technician containing , Screw Driver Set , Hammer, Pliers, Hacksaw, Knife, C Headed spanner set, Ring spanner set, Box spanner set, Adjustable Spanner set , Line Tester, Squeezer/Splicer, Measuring Tape., Shorting Chains , Torch etc.
2. PPE s like Helmet, Safety Shoes, Rain coat & gumboot., Safety Belt.
3. Ratchet Set
4. Chain Pulley 3 Ton cap.
5. Crimping Tools
6. I Level Bottle
7. Welding m/c
8. Hot Air Blower
9. Vacuum Cleaner for Small items washers
10. Tap kit with handles
11. Hand drill m/c
12. Cable pulling winch
13. Oil Pump
14. Trifor m/c
15. Manila Ropes

Note: All lifting tools, tackles & equipment's third party inspection report (TPI, validity within 1 year) required before use.

Scope of Work
for
Preventive, Predictive & Breakdown Maintenance
of
132kV D/C Transmission Line from J K Nagar to Pandabeswar TSS, E.Rly. via Shyam Sel
for 12 Months Period

Purpose:

1. The entire scope of Work as noted below is the least but not minimum. Any other jobs that seems to be fit and technically required to maintain the upkeepment of the system, shall be considered within the scope as stipulated by the In charge / authorised Engineer of IPCL.
2. Before selection and deployment in the Team, all the personnel of the Contractor will be interviewed by IPCL to check for their work experience, efficacy and profile matching with the requirement of job scope. After inclusion, their performance will be reviewed by IPCL every three months to check for the suitability to allow them to continue in the defined role.
3. **Man-Power Matrix:-**
Total Required Manpower against daily surveillance as mentioned below-

Manpower	Skilled	Semi-Skilled	Un-Skilled	Total
	2	2	3	7
Grand Total in Man-Head				7

For Daily Surveillance entire line has been divided into three parts–

- a. Surveillance of Zone 1 – 1 Manpower
 - b. Surveillance of Zone 2 – 2 Manpower
 - c. Surveillance of Zone 3 – 1 Manpower
- For Night Patrolling – 2 Manpower
Reliever – 1 Manpower

However, depending on situation daily roaster may be changed as per instruction officer in Charge of IPCL.

- 4. The Contractor must have the Supervisory License to work upto 220kV /132kV /33kV Outdoor & Indoor system as per Govt. statutory norms.

Scope of Work:

Daily Surveillance with Preventive, Predictive and Breakdown Maintenance of 132kV Double Circuit Transmission Line from J K Nagar to Pandabeswar TSS, E. Rly.

Surveillance Work shall be carried out for the entire route of 33 kM double circuit Transmission line. Surveillance work shall be carried out by engaged Contractor on daily basis and Surveillance Report, duly signed and stamped, shall be submitted to IPCL designated Executive/Manager twice in a week as per the prescribed format approved by IPCL. There shall be no lagging or delay in submission of the report. Necessary planning for rectification & regular work shall be done immediately in consultation with designated Executive/Manager of IPCL as per the Surveillance report.

- 1) Regular patrolling of lines & submission of report as per the approved format by IPCL- report must be submitted twice a week to IPCL authorized Executive/Manager, duly stamped and signed.
- 2) Inspection of foundations and completeness of tower members, cross arms, cross bracings, earthing, anti-climbing devices, danger plates & signs.

- 3) Identification of any defect in Chimney and to ensure minor repair of tower foundations if required, only material cost will be reimbursed by IPCL on submission of actual invoice on verification by IPCL Engineers.
- 4) Identification of Earth removal & Earth Filling and taking immediate action, only material cost will be reimbursed by IPCL on submission of actual invoice on verification by IPCL Engineers.
- 5) Identification & replacement of missing/ damaged tower members and other accessories, only material cost will be reimbursed by IPCL on submission of actual invoice on verification by IPCL Engineers.
- 6) Tightening of Nut and bolts in Tower where required on immediate basis – if replacement required only material cost will be reimbursed by IPCL on submission of actual invoice on verification by IPCL Engineers.
- 7) Scanning of hotspots in line on sample basis by thermo vision camera, to be provided by IPCL and report to be prepared under supervision of IPCL Engineers.
- 8) Identification & replacement of Broken/ damaged Suspension/Tension insulators, only material cost will be reimbursed by IPCL on submission of actual invoice on verification by IPCL Engineers.
- 9) Identification & replacement/repair of damaged conductor/earthwire, jumpers and other line accessories, only material cost will be reimbursed by IPCL on submission of actual invoice on verification by IPCL Engineers.
- 10) Pre & Post monsoon inspections with actionable reports.
- 11) The Contractor must ensure that there will be no theft of items of Transmission line. If theft occurs, it will be of Contractor's responsibility to inform immediately & take proper action like arranging all documents, evidences and liasoning with local Police Station within same day towards lodging FIR by IPCL
- 12) Night patrolling to be done on daily basis for the entire line. Photographs to be taken with GPS enabled camera / mobile and to be shared with IPCL
- 13) Tree trimming along the corridor of the transmission line & removal of vegetation growth along the transmission line route, compensation if any will be

reviewed and reimbursed/paid by IPCL against proper document subject to prior approval from IPCL Management.

- 14) Contractor's scope of work also include deployment of plant equipment, machineries required for stringing and erection work.
- 15) All personnel must adhere to all the statutory safety guidelines stipulated by IPCL & Govt. safety norms. Zero tolerance to the non-compliance of that guideline to be ensured. The contractor shall provide Safety PPE's to the workers.
- 16) Manpower required to be deployed at site to address any kind of break down, will be as per requirement under discretion of IPCL to restore the normalcy within shortest possible time (2 hrs.). Moreover, considering the nature of break down manpower, all types of special tools & tackles required for the operation and maintenance will be deployed along with additional manpower after certification from IPCL competent authority.
- 17) The entire line patrolling day & night shall be carried out by a 4 wheeler (Utility Vehicle as Tata Yodha or equivalent) to carry tools & tackles and small accessories with sitting arrangement of minimum 4-5 persons. This vehicle to be provided by the Contractor, movement and KM should be reviewed by IPCL. Fuel and mobile reimbursement will be done as per IPCL prevailing guideline.
- 18) Essential Materials required for said surveillance /breakdown job will be free issued to the contractor. In case of non-availability of materials at IPCL store, Contractor has to supply those materials only after certification by IPCL as per approved design, drawing and GTP of IPCL. **Minimum mandatory spares** to be kept in contractor's scope may be provided by IPCL or Reimburse by the appointed contractor on need basis at the prevailing market rate at the time of purchase but we expect the service provider should maintain the minimum stock at their end.
 - i) AAAC PANTHER Conductor - 2 km
 - ii) 7/3.66 mm GS Earth wire - 0.5 km
 - iii) 120 KN Insulator- 240 Nos
 - iv) 70 KN Insulator - 60 Nos

- v) Double Tension Fitting - 12 Set
- vi) Single Tension Fitting - 12 Set
- vii) Single Suspension Fitting - 6 Set
- viii) Conductor V.D. - 12 Nos
- ix) Earthwire V.D. - 2 Nos
- x) Earthwire Tension Clamp - 2 Set
- xi) Earthwire Suspension Clamp - 1 Set
- xii) Different Tower members , Nut& Bolts etc – 1 Lot

19) Recovered materials, if any, should be returned at nearest IPCL store without any further cost.

20) Apart from above, during any major breakdown like falling of Tower, snapping of Conductor / earth wire etc. after any catastrophe / natural calamity etc. the Contractor should be capable to strengthen & depute the required skilled /unskilled manpower resource at site within a very short period of time as required to restore the normalcy of the system. This additional manpower engagement shall be covered by a separate Work Order subsequently based upon the approved rates of IPCL. In this context tentative proposed job scope as follows –

Proposed scope for Breakdown Maintenance of 132 kV TL:-

Sl. No.	Job Description	UoM	Proposed Rate
1	Stringing of Three Phase Single Circuit Conductor of 132 kV TL	km	
2	Stringing of Three Phase Double Circuit Conductor of 132 kV TL	km	
3	Dismantling & Stringing of Double Circuit Conductor of 132 kV TL (Replacement of old conductor by new conductor within same tension point and per extra meter span length)	km	

Sl. No.	Job Description	UoM	Proposed Rate
4	Dismantling & Stringing of Single Circuit Conductor of 132 kV TL (Replacement of old conductor by new conductor within same tension point and per extra meter span length)	km	
5	Repairing of conductor by repair sleeve by dismantling from suspension tower of 132 kV TL	Per Span	
6	Replacement of old earth wire of 132 kV TL	Per Span	
7	Splicing of Tower Leg of 132kV TL		
8	Opening of Jumper & Rejoining of One Circuit of 132 kV TL	Set	
9	Replacement of Jumper of of 132 kV TL	No	
10	Tightness checking of Jumper per Tower/Circuit of of 132 kV S/C TL	No	
11	Tightness checking of Jumper per Tower/Circuit of of 132 kV D/C TL	No	
12	Phase to Phase T-Off Connection & Disconnection using PG and relevant used conductor of One Circuit of 132 kV TL	Set	
13	Changing of Insulator (70/120 KN) for Tension Tower of 132 kV TL	Per Phase	
14	Changing of Insulator (70/120 KN) for Suspension Tower of 132 kV TL	Per Phase	
15	Tightness checking of N&B of Towers of 132kV TL	Per Tower	
16	Laying, Stringing, Tensioning, Clamping, Jointing etc. complete of 1 no. EarthWire with all requisite accessories for complete route kM.	km	
17	Earthing - Pipe Type with material	No	
18	Earthing - Counter Poise Type with material	No.	

Note: Apart from above any other essential job scope may be mentioned with brief description and rate.

21) **List of Tools & Plants for 132 kV Breakdown Maintenance in Contractor Scope :-**

- a. Manual Winch Machine – 1 Set
- b. Portable drill machine (Battery operated) – 1 Set
- c. Manual Compressor Machine – 2 Set
- d. Die (AAAC Panther, 288 Sq.MM) – 2 Set
- e. Die (G.I. Earthwire) – 2 Set
- f. Lefty (70 m) – 2 Set
- g. 3 T Hook Type Pulley – 4 Set
- h. 5 T Hook Type Pulley – 4 Set
- i. Comealong Clamp (Conductor)– 6 Set
- j. Comealong Clamp (Earthwire)– 2 Set
- k. Safety Clamp - 2 Set
- l. 10 mm Wire Rope – 200 Mtr
- m. 10 mm Wire Rope of 5 mtr length (Sling) – 8 No
- n. 18 mm P.P. Rope – 2 Bundle
- o. 20 mm P.P. Rope – 2 Bundle
- p. Areal Roller – 6 Set
- q. Crow Bar – 12 Nos.
- r. D-Shackle (24 mm) – 10 Nos.
- s. Hammer (5kg) – 2 Nos
- t. Hammer (2kg) – 2 Nos
- u. Ring Spanner of every size – 2 Set
- v. Box Spanner of every size – 2 set
- w. Torque Range – 2 Set
- x. Round File – 10 Set
- y. Flat File – 10 Set
- z. Hacksaw frame with blade – 6 Set
- aa. Motorized Tree Trimmer – 2 Set
- bb. Binocular – 2 Set
- cc. Insulated Discharge Rod suitable with 245 kV level – 6 Nos.
- dd. VAV (Verification for absent of Voltage (non touchable, upto 245 kV) – 1 Set
- ee. Insulated hand Gloves (245 kV grade) – 2 Set
- ff. Earth Resistance Tester – 1 Set
- gg. Insulation Tester upto 5 kV – 1 Set

22) List of PPE's & Safety equipment's in Contractor scope :-

- a. Pre deployment medical test report of deputed manpower – Annually
- b. Full Body Harness – 2 Nos.
- c. Full Body Harness with shock absorber – 4 Nos.
- d. Tolls Lanyard – 2 Nos.
- e. Blue Helmet – 10 Nos.
- f. Reflective Jacket – 10 Nos.
- g. Normal Hand Gloves – 10 Set.
- h. Safety Goggles – 10 Set
- i. Safety Shoe – 10 Set
- j. Gum Boot – 10 Set
- k. Rain Coat – 10 Set
- l. Night Vision Torch – 2 Nos.
- m. Fall Arrestor – 2 Set
- n. Fall Arrestor Rope (70 Mtr.) – 2 Set
- o. Caution Tape – As required.
- p. First Aid Box with register – 1 Set

Note: All lifting tools, tackles & equipment's third party inspection report (TPI, validity within 1 year) required before use.