



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER)
THIRUVANANTHAPURAM**

VOLUME II: ADDITIONAL CONDITIONS OF CONTRACT

NAME OF WORK: Operation and Maintenance of 33kV and 11kV substations, 11kV Diesel Generator and LT DG sets in IISERTVM campus, Thiruvananthapuram

NIT NUMBER: IISERTVM/EO/E&M/101/19/2021-22 dated: 17-09-2021

These special conditions gives terms and conditions of the contract and these shall be read in conjunction with the general terms and conditions of contract and amendments, corrections thereto. If there are any provisions in the special conditions which are at variance with the provisions in the general conditions of contract, the provisions of these special conditions shall take precedence.

1. LOCATION:

The work has to be carried out at 33kV and 11kV substations at IISER TVM campus at Vithura, Thiruvananthapuram

2. SCOPE OF WORK:

OPERATION AND PERIODIC MAINTENANCE OF FOLLOWING INSTALLATIONS AND ACTIVITIES ARE TO BE CARRIED OUT:

- i. Operation and periodic maintenance of all equipments of 33 kV /11 kV substation consisting of 33 kV and 11kV HT VCBs, 5 MVA (33kV/11kV) Transformers (ONAN) - 2 Nos, 2MVA (11kV/433V) Transformer (Cast resin)- 2 Nos, 1MVA (11kV/433V) Transformer (Cast resin) - 6 Nos.,1250 KVA cast resin (11KV/433V) PSS, 1010KVA 11KV Diesel Generator- 2 Nos, 380KVA 415V Diesel Generator-1No, 160KVA 415V Diesel Generator-1No, 15KVA 415V Diesel Generator-1No,5KVA 230V Petrol generator-7nos., UPS, battery & charger, Electrical panels, DBs, Internal & External electrical fittings, earthings and its terminations, all HT/LT cables and its terminations etc.
- ii. Printed Log books shall be arranged and maintained by the contractor as per the format approved by IISER.
- iii. Operation and day to day maintenance of Internal electrical Installations of 33kV Main receiving station and 11kV substation-1,2,3,4 and PSS in phase-2 Hostel area covers the servicing of light fittings, ceiling fans, exhaust fans, wiring, LT panels etc. Proper cleaning of all equipments, floor, cable trench, ceiling, terrace top, outer surroundings of substation etc shall be done as per requirement and as detailed subsequently. Periodical removal of bushes and vegetation from the MRSS, Isolator area, SS1, SS2,SS3 and SS4 yard premises to be done by agency. Proper cleaning of all equipments, floor, cable trench, ceiling, terrace top, outer surroundings of substations etc shall be done as per requirement and as detailed subsequently. Expenditure for these cleaning works shall be included in the quote.
- iv. The staff deployed by the contractor shall, as desired by the EIC carry out routine repairs/maintenance of any other equipments/installations other than those mentioned above which are likely to be installed during the period of the contract to suit the operational requirements of the Substations/IISER Campus.
- v. The staff deployed by the contractor in SS2 shall attend daily electrical complaints/maintenance/additional works in the hostel and Central dining block area.
- vi. The staff deployed by the contractor in SS3 shall attend daily electrical complaints/maintenance/additional works in the residence area.

- vii. The staff deployed by the contractor in SS4 shall attend daily electrical complaints/maintenance/additional works in the academic area.
- viii. The operator in SS4 will be in charge for the SS2 and SS3 and the operator in SS1 will be the in charge for Package Substation and he shall ensure that for any work in the SS2 and SS3 minimum two persons is available.

3. MONITORING OF ALL EQUIPMENTS:

- i. The Contractor shall monitor the functions of all equipments in the sub stations to make log entry of parameters, supply failure, tripping etc as per the requirements of IISER.
- ii. The Contractor shall be liable to monitor and attend complaints in Package substation in Phase2 hostel area with the available manpower at site without any extra cost and without disturbing the existing operation.
- iii. In case, un serviceability of equipments such as CTs, PTs, Transformers, DGs, HT VCBs, cables, cable end terminations, UPS, battery, MCB, etc. occurred and not because of negligence of operating agency, on the basis of written instruction from EIC, the operating agency shall carry out the rectification/replacement satisfactorily and bill along with original invoice of spares/service charge from the repairing agency to be submitted to IISER for processing. IISER will process the invoice by adding 15% overhead and profit margin and payment will be released along with monthly RA bills. If IISER want to repair the equipment through OEM or authorized service dealer directly, IISER has full right to do so.
- iv. The Contractor shall not carry out any additions/alterations, shifting/removing of the installation himself. The installations shall be handed over back to IISER in good condition at the end of the contract period. Any damages to IISER property noticed due to deliberate/irresponsible attitude of contract staff shall be analysed and necessary amount will be adjusted from the contractor's bill amount/security deposit available with IISER. The decision of the EIC shall be final and binding in this regard.
- v. Complaints of routine nature such as replacement of fused lamps, tubes (will be issued by IISER), cleaning, bush cutting etc. shall be done as per site requirement.
- vi. The contractor shall make arrangements for daily monitoring and recording of the status of Central UPS kept at Chemical Science Block, Physical Science Block, Biology Science Block and Animal House in IISERTVM campus.

4. PREVENTIVE MAINTENANCE:

- i. This section specifies the Preventive maintenance requirements of various installations covered under this contract.
- ii. A brief indication of various maintenance checks are mentioned in "ANNEXURE-A to ANNEXURE- E" for up keeping of major Electrical & Mechanical installations. However, the detailed schedule for

maintenance check shall be prepared by the successful tenderer and got the same approved by the Engineer in charge. However, for carrying out preventive maintenance checks for HT VCBs, Transformers, DGs, HT cable termination etc. shall be executed only after the permission is obtained from electrical section of IISER.

- iii. During the period of the contract, if any other maintenance checks are found to be necessary on any installations, as per original equipment manufacturer or sound engineering practice, the same shall be carried out and no extra claim shall be admissible in this regard. As far as possible maintenance checks shall be carried out during holidays or lean periods without affecting the power supply system/services. The contractor shall maintain necessary records for the maintenance checks. An one time check-up by the authorised service agency for the DG sets shall be executed during the period of contract.
- iv. Measurement of earth resistance for all earth pits/mats and meggering of insulation value of all the cables, etc., are to be carried out at least twice per year during the contract period and result to be submitted to the Engineer-in-Charge. One of such testing will be carried out within two months from date of start and 2nd will be after 6 months from the date of first testing failing which recovery will be made as per clause no: 18(ii) of Special condition of contract. All earth pit cover shall be painted once in a year with black enamel paint and numbering in yellow point shall be given as per register along with value.
- v. Preventive maintenance activities specified for the respective system has to be carried out, in time specified by the EIC. Preventive maintenance activities for the system(s) covered in the contract have been detailed in the proceeding annexure. Frequency of certain preventive maintenance activities can be changed by EIC as per guidelines issued from IISER and any additional activities can be added from time to time.
- vi. Printed registers has to be maintained, for entering all the maintenance activities as per appendixes which shall be signed by the contractor and the Engineer-in-Charge or their authorized representatives. The requirement and format of the log books/registers shall be finalized in consultation with Engineer-In-Charge. Following tentative log books are to be maintained by the agency.
 - a) Maintenance register of earth value(33kV MRS, 11kV SS1,SS2 & SS4)
 - b) Log book for monitoring 33kV side voltage,current,11kV side voltage ,current, frequency, power supply interruption details with time, reason etc.
 - c) Maintenance log books as per Annexure-A to E.
 - d) Daily log book (Shift hand over, take over between staffs, brief of work done, details any incident, complaint etc.).
 - e) Attendance register.
 - f) History equipments register for all major.

- vii. All required registers shall be procured by the Contractor and after completion they shall become property of IISER. The Contractor has to return the completed registers to the EIC.
If the Contractor fails to carry out 100% of the preventive maintenance activities on each and every type of installation covered in the scope of work as per the preventive maintenance schedule, recovery as per clause no: 18(iii) of Special condition of contract shall be made.
 - a. The agency shall liaise with KSEB for up keeping the power supply system and coordinate for planned maintenance by KSEB with minimum downtime. All necessary assistance shall be offered by the agency on behalf of IISER.

- viii. **BREAKDOWN MAINTENANCE:**
During award of contract, agency shall report the incidence of breakdown immediately to IISER and necessary co-ordination and follow up action till rectification of defect by the concerned agency form part of the scope of work.

5. DURATION OF CONTRACT:

This contract shall be for a period of 365days. IISER reserves the right to extend the period of contract for the BOQ items Sl no. 1, 2, &3 a period up to 120 days on the same terms and conditions, accordingly validity of performance guarantee and security deposit BG also to be extended. If required IISER reserves the right to terminate the contract fully or partially by giving 30 days' notice in writing to the contractor. If in the opinion of the Engineer-in-Charge, it is observed that the contractor is not doing the works satisfactorily as per the terms and conditions of contract, then the Contract can be terminated with immediate effect without giving any reasons thereof.

6. SECURITY:

- i. The Contractor and his employees shall abide by the security regulations framed by IISER from time to time. He shall apply for entry permits submitting the list of personnel being engaged for this work. Any incidental charges for this purpose are required to be borne by the Contractor.
- ii. Loss of any pass shall also attract a penalty as stipulated by the Issuing Authority.
- iii. Any employee of the Contractor who is found to be incompetent to carry out the work(s) or misbehaves shall be intimated to the Contractor, who in turn, has to arrange for a substitute. Apart from arrangement of substitute the Contractor shall ensure that the pass issued to the original employee is returned to the Issuing authority, failing which, penalty as decided by the Authority shall be imposed.
- iv. The contractor has to take moral responsibility for the overall character of the staff employed by him or intends to engage. The contractor has

- to make sure that no staff should be remaining in the IISER premises after his duty is over.
- v. The contractor shall issue uniform, safety shoes etc and photo identity card to all its employees deployed in the IISER premises and same shall be displayed/used all the time when on duty.

7. LABOUR REGULATIONS:

- i. The Contractor shall abide by the provisions of all applicable laws including the Minimum Wages Act, Labour Laws in respect of the services to be rendered under this contract. It is to be clearly understood by the contractor and intimated by him to his employees deployed for the purpose that this service agreement shall not constitute any relationship of employer/employee between IISER on the one hand and employees of the contractor on the other.
- ii. The rates quoted by the Contractor shall be inclusive of the necessary ESI subscription for the personnel and contribution towards EPF shall be made as applicable. certified copies of certificates / receipts showing details like amount, names and PF/ESI account numbers of beneficiaries from the PF and ESI shall be submitted by the contractor every month before claiming payment, failing which, an amount equivalent of monthly subscription amount shall be deducted from the bill and shall be reimbursed to contractor only upon production of requisite documentary proof and decision of EIC in this regard shall be final and binding to the contractor. The Contractor should display a board with relevant particulars as per the labour regulations after taking over the site.
- iii. The contractor shall engage the necessary manpower who are physically fit, sound in health and having knowledge of safety regulations, the staff deployed for this contract shall be on the permanent rolls of the Contractor. Normally any staff should not be deploy more than one shift per day. If it is unavoidable then agency has to pay him as per labour regulations for additional shift.
- iv. Agency has to pay the wages of staffs not less than the minimum wages mentioned in the Minimum Wages Act and Labour Laws on following category throughout the contract period, failing which his tender will be cancelled. Any financial liability incurred by IISER will be adjusted from the dues of agency including by encashing the BG.
- 1) Operator
 - 2) Operator assistant
 - 3) DG operator/mechanic.

8. PAYMENT:

- i. The Departmental Engineer shall record measurements and payment shall be made monthly for the services rendered in the previous months, for which the Contractor shall raise a bill against IISER in the prescribed format as required, after deductions towards Security

Deposit, income tax and surcharges and penalties, etc. as applicable from running bills.

- ii. The Contractor shall maintain an attendance register which shall be checked by the Engineer-in-Charge or his representatives as and when necessary. Payment of wages to the Contractor's employees shall be made on or before 7th of every calendar month through bank accounts only, statement regarding the same shall be submitted to the Engineer-in-Charge/his representatives for verification. Prevailing minimum wages are considered at present.
- iii. If there is an increase in the minimum wages as per State/Central Government orders, the same shall be paid as applicable to the staff deployed by the Contractor, If the increase in minimum wages is more than 10 % of Prevailing Minimum wages then increase in labour payment above 10% of prevailing minimum wages will only be reimbursed by IISER on production of documentary evidence. The agency shall offer this rates by considering the above.

9. QUALIFICATION OF STAFF DEPLOYED AND MINIMUM REQUIREMENTS OF MANNING FOR OPERATION AND MAINTENANCE:

- i. The details in respect of qualifications and experience of each employee shall be submitted to the EIC, within (15) fifteen days of the issue of the work order.
- ii. The Contractor has to deploy required manpower including reliever in addition to minimum staff requirement shown in Clause no: 23 of Special condition of contract. Any operational failure due to lack of minimum manpower shall lead to a penalty as per clause no:18(i) of Special condition of contract. While deciding the nature of failure and levy of penalty, the decision of the Engineer-in-charge shall be final and binding on the Contractor. Any consequential damage caused to IISER property which is attributable to lack of timely attention shall be recovered from the Contractor's bill at prevailing rates and its decision of the EIC shall be final and binding in this regard.

10. SAFETY REGULATIONS AND PRECAUTIONS:

While carrying out the works, the contractor shall take adequate care and observe relevant safety precautions. Necessary safety gadgets shall be provided by the Contractor to comply with statutory regulations. He shall indemnify IISER against claims for compensation in this regard. Within 15 days of placing of the order, he should arrange for training for the personnel engaged by him on preventive maintenance, safety regulations, safety precautions and general idea about operation of firefighting equipments, pre and post hazard activities.. In continuation to the above training the Contractor should review the situation at regular intervals not exceeding 2 months and take action as per the situation. He should replace the manpower who is not responding to the training.

11. SECURITY DEPOSIT:

Refer GDC clause no. 1A, page no. GDC-11 to 12

12. DAMAGE TO IISER PROPERTY:

Any damage caused to IISER's Installations by workers employed by the Contractor during the course of execution of the work shall be made good to the satisfaction of the EIC, failing which, the same will be recovered from the Contractor's bill if proper justification is not given by the contractor. However, the decision of EIC is final and binding on the Contractor.

13. RATES:

The party may quote the rate keeping in view the services to be maintained, manpower to be deployed, EPF/ESI and GST to be paid, etc.

14. TOOLS AND TEST EQUIPMENTS:

All the tools, test equipments and safety gadgets, special T& P and Ladders required for this work shall be provided by the Contractor as per clause no:20 of Special condition of contract.

In addition to above, Each Technician deployed on duty shall possess the following tools.

- i) Nose Pliers - 1 No.
- ii) Cutting Pliers - 1 No.
- iii) Adjustable Spanner - 1 No.
- iv) Double end type spanners - 1 set.
- v) Screw Driver set (5 blades) - 1 set.
- vi) Double test lamp set - 1 No.
- vii) Line tester - 1 No.
- viii) Wire stripper-1 No.
- ix) Ring spanner set- 1No.

15. ANCILLARY MATERIALS:

All the cleaning materials such as cotton waste, cotton cloth or duster, lubricating oil, grease etc. for this work shall be provided by the Contractor. The details of tentative cleaning materials and tools to be made available are indicated in Clause no:20 of Special condition of contract.

16. CONSUMABLE SPARES :

All consumable spares such as tube lights, Indication lamps, CFL/LED/HPSV lamps etc. shall be replaced as and when required by the agency. Any materials issued by IISER if any shall be handled by the personnel with utmost care and record to be maintained, and the dismantle material is returned to EIC.

17. WORKING HOURS :

The working hours of this contract shall be round the clock (24 hour basis) on all days including Saturdays, Sundays and Public Holidays.

18. PENALTY :

- i. Any operational failure due to lack of man power will be attract penalty of Rs 1000/- per failure.
- ii. As per clause no:4.4 the first earth resistance test shall be conducted within two months from the date of start of work. If the first earth resistance test couldn't be conducted within 2 months a penalty of Rs 5000/- will be levied.
- iii. As per clause no:4.7, if the contractor is fails to carry out the preventive maintenance activity as per schedule a penalty of, Rs 2000/-per installation per month shall be recovered. Any break down or failure including repair charges of such equipments during the period shall be levied to the agency.
- iv. If the duty staffs were found without any safety gadgets a penalty of Rs 1000/- will be levied for each occurrence.

19. DISCREPANCY/DIFFERENCE/CONTRADICTION:

Should there be any difference/ discrepancy/ contradiction in the provision of the specification of item of work and the description of the item given in the Bill of Quantities, the scope of item shall be taken according to the following order of preference.

- (a) Nomenclature of the items as given in the Bill of Quantities.
- (b) ADDITIONAL CONDITIONS OF CONTRACT.
- (c) Sound Engineering practice as directed by the Engineer-in-Charge whose decision in this regard shall be final and binding on the Contract.

20. QUANTITY INDICATED SHALL ALWAYS BE KEPT AT 33KV MAIN RECEIVING STATION:

I	CONSUMABLES ITEMS FOR DAY TO DAY MAINTENANCE:
a)	Cotton /Choro cloth/baniyan waste - As and when required
b)	Grease - As and when required (HPCL Linton - 2 /, Balmoro, Moly -MI or Licon -2).
c)	Lubricating oil - As and when required
d)	Insulation tape - As and when required
e)	Scrubber- As and when required
f)	Hacksaw (heavy duty and light duty) - 1 each
g)	Petroleum Jelly -) 1 Kg/year.
h)	Battery water-as required
i)	Carbon tetra chloride (laboratory type CTC)/CRC/DC-2-26/ Rust remover (200 ml). - As and when required
j)	M-seal/silicon sealant- As and when required
h)	Paint brush- As and when required
II	TOOLS & PLANTS : (contractor shall ensure serviceable tools/meters throughout the contract period)
a	Aluminium Ladders (8ft and 12ft) - 4 Sets for each substation.
b	Multimeter (digital) - 2 Nos. (Make: Fluke/ Rishab)

c	Digital Meggar 1000V and 5000 V -1 no each. (Make: Fluke/ Rishab/Meggar)
d	Earth tester - 1 No. (Make: Waco or Equivalent)
e	Crimping Tool (25sqmm to 400 sq.mm including Die set) - 1set
f	Crimping Tool (up to 16 sq.mm) - 1set
g	Hexagonal socket (19 socket + 6 accessories) - 1 set.
h	Drilling machine heavy duty with hammering/power including drill bits (up to 26mm)- 2 sets.
i	Screw Driver set (8 blade) - 1 No.
j	Screw Driver set heavy duty cross and minus - 2 Each
k	Nose pliers - 1 No.
l	Claw hammer with handle (500gms) - 1 Nos.
m	Claw hammer with handle(1000gms) - 1 Nos.
n	Torch led (Brite light, Everady) and Emergency light - 2 Nos.
o	Tong tester - 2 No. (0-1000 Amps range) (Make: Fluke/ Rishab)
p	Vacuum cleaner with air blower - 1 Each.
q	Air blower hand held type-1No.
r	Grease gun(lever type) - 1 No.
s	Allen key set up to 10 mm,5/8,1/2,9/16 sizes
t	Bearing Puller and Wire puller - 1 No each
u	H.T. Gloves (33 KV-2 Set and 11 KV-5 Sets)
v	5" angle cutter/grinder with wheel-1no.
w	Round file-1no.
x	Hole saw cutter- As and when required
y	Torque wrench-2nos.

Note:-This arrangement is over and above the individual tools set to be issued to Technician on duty.

21. The Contractor shall be responsible to keep the above under his safe custody and watch and ward at his cost and make the above available as and when needed. The above tools and plants are in addition to the tools and test equipments covered under Clause no. 14 of SCC. After taking over the site the Contractor has to provide the T & P mentioned above immediately. If the Contractor fails to provide the T & P / consumables items for day to day maintenance, the same will be procured by IISER at the risk and cost of the Contractor and after completion of the contract period they will become the property of IISER. All the tools and test equipments shall be calibrated from Government approved laboratories and Calibration certificates shall be submitted to EIC within 30 days of award of work. The expenditure towards the calibration shall be borne by the contractor, failing which the same shall be carried out by IISER at agency's risk and cost and recovery amount will be 1.5 times of actual expenditure. The periodic calibration as required also shall be carried out by the agency.

22. MANNING OF EQUIPMENTS/ INSTALLATIONS & MINIMUM QUALIFICATION REQUIREMENTS:

- i. It is required to operate and maintain the installation in the 33kV Receiving station, 11kV substation-4 and 11kV substation-2 for three shifts of 8 hrs. Duration each of normal working hours from 0600hrs - 1400 hrs, 1400 hrs - 2200 hrs and 2200hrs - 0600 hrs. The agency has to provide sufficient staff as a reliever for the staff who will be on duty for week days. All the staff shall be given one day weekly off after working for 6 continuous days. No extra payment shall be made for reliever duty.
- ii.
 - a) **Operator:** He should be Degree in electrical engineering with 1 year experience/Diploma in electrical engineering with three years of experience in HT substation operation or maintenance or installation field which preferably includes handling of 33 kV/11 kV HT installations. He should have sound knowledge in maintaining the electrical system along with registers like preventive, day to day and break down maintenance etc. He should be able to guide the workers properly.
 - b) **Operator Assistant:** The operator assistant employed must be ITI certificate holders in wireman/electrical trade with one year experience in electrical wiring and maintenance works. Preference will be given experience in HT (33kV/11kV) maintenance.
 - c) **DG operator:** The DG operator employed must be ITI certificate holders preferably in Diesel engine mechanic/electrical trade and with one year experience in diesel generator operation and mechanic works. Preference will be given experience in 11kV DG maintenance.
- iii. **Uniform:** For easy identification, all the employees deployed by the agency shall be provided with at least 2 sets of uniforms and one pair of safety shoes and the colour of uniform shall be decided in consultation with IISER. Photo identity card with name, address, designation, date of birth, blood group shall be issued by the agency to all its employees deployed for the work. The employees shall be in uniform and shall wear the ID card always while on duty.

23. MINIMUM STAFF REQUIREMENTS:

This requirement is for engaging of staff on daily basis including weekly holidays and general holidays for the entire duration of contract. (The duty timing and the manpower utilization shall be as per the IISER requirement).

Sl no.	Location	Category	1 st shift	2 nd shift	3 rd shift	Total
1	MRSS/SS1	Operator	1	1	1	3
2	MRSS/SS1	DG operator	1	1	1	3
3	SS2	Operator asst.	1	1	1	3
4	SS3	Operator asst.	1	1	1	3
5	SS4	Operator	1	1	1	3
6	SS4	Operator asst.	1	1	1	3

TOTAL NUMBER OF STAFF- 18 (Excluding reliever).

Note:

I. The duties shifts shown are only for Tendering purpose. On award of work, Duty Roaster shall be put by the contractor in consultation with EIC as per the site requirement.

III. The leave reliever, off reliever etc. as per statutory norm shall be entrusted and quote of the agency shall be considering this aspect. Nothing extra will be paid in this regard other than the granted rate.

IV. The technicians, equipments, tools etc. engaged for attending preventive maintenance shall be separate and agency shall be engaged as per site requirement to complete the activity as per preventive maintenance schedule.

ANNEXURE-A

PMI SCHEDULE FOR ELECTRICAL SYSTEM AT 33kV MRSS, SS-1, SS-2 , SS-4 and PSS at phase2

Check for the following		D	W	M	Q	H
a.	Non-burning of lights. Rectify the fault.	*				
b.	Noise from light fittings. Corrective action to be taken.	*				
c.	Flickering of tube, blackening of tube light ends. Corrective action to be taken.	*				
d.	Loose connections/Loose wiring/termination points in DBs to be attended.			*		
e.	Cleaning of floor/ panels including cleaning materials.		*			
f.	Switch / Power plug/MCB DB conditions are to be checked.			*		
g.	Cleaning of light fixtures , tubes & louvers			*		
h.	Cleaning inside cable trench, cob web removal.			*		
i.	Checking of earth connection (outdoor and indoor)			*		
j.	Cleaning and removing of grass, bushes etc around the Substation.			*		
k.	Up keeping of First aid box.		*			
l.	Checking of earth pits and measurement of earth value.					*
m.	Checking of Fire extinguishers			*		
n.	Physical inspection of HT and LT cables	*				
	Note: Earth pit cover painting and numbering to be done once in a year.					
	LEGEND :					
	D - Daily					
	W - Weekly					
	M - Monthly					
	Q - Quarterly					
	H - Half yearly					

ANNEXURE-B

PMI SCHEDULE FOR TRANSFORMERS.

Check for the following		D	W	M	Y
a	Oil level, condition of Silica Gel, oil leakage of transformers, abnormal sound to be checked.	*			
b	Monitoring the temperature of Transformer winding and oil.	*			
c	General cleanliness of the transformers, floor, trench etc.	*			
d	Checking the working condition of emergency off switch in the transformer room and tripping of corresponding HTVCB.			*	
e	Cable termination tightness in the primary and secondary side of the winding.			*	
f	Checking of neutral earth, body earth and its terminations.			*	
h	Lubricating the rolling shutters and its function.			*	
i	Overall preventive maintenance including measurement of IR				*

ANNEXURE-C

PMI SCHEDULE FOR 33KV/11KV HT VCB panel

Check for the following		D	W	M	H
a.	Working condition of all meters such as voltmeters, ammeters and indications on the HT panels.	*	-	-	-
b	HT/LT Voltages in three phases & current in each phase.	*	-	-	-
c	Monitoring the abnormal heat , vibration and sound.	*	-	-	-
d	Working Of tripping relays ,its indications and operation of counter.	-	-	*	-
e	General cleanliness of the 33kV/11kV HT VCBs, floor, trench etc. (unwanted, inflammable materials should not be stored inside the rooms)	-	*	-	-
f	Checking & cleaning the bus bars, jumpers, breaker truck , fixed and moving contacts, CT,PT, lubricating the mechanical parts etc.	-	-	-	*
g	Cable termination tightness inside the HT panels. Inside cleaning of HT panels.	-	-	-	*

PMI SCHEDULE FOR LT PANELS.

Check for the following		D	W	M	H
a.	General cleanliness of the LT panels, trench . (unwanted, inflammable materials should not be stored inside the rooms)	*	-	-	-
b	LT Voltages in three phases & current in each phase.	*	-	-	-
c	Checking of MCCB, MCB and its terminations.	*	-	-	-
d	Visual checking of in busbar and cable alley to identify loose contacts. Rectification to be done urgently.	-	*	-	-
e	Working condition of all meters such as voltmeters, ammeters and indications on the LT panels.	-	-	*	-
f	Cable termination tightness inside the LT panels. Inside cleaning of LT panels.	-	-	*	-
g	Checking of Earth termination to LT Panels.	-	-	*	-
h	Tightness of Busbar, termination bolts and nuts.	-	-	-	*

PMI SCHEDULE FOR APFC PANELS

	Description	D	W	M	Y
a.	Overall preventive maintenance of the panel which includes cleaning, tightness of terminations and bus bar, replacing the damaged parts,				*
b.	Monitoring the PF reading			*	
c.	Checking the Working condition of all meters,		*		
d.	General cleaning of panel	*			

PMI SCHEDULE FOR 11KV/415V DG SETS

Check for the following		D	W	M	H
a.	Working condition of all meters such as voltmeters, ammeters and indications on the DG panels.	*	-	-	-
b	Battery bank terminations and charger to be checked. Battery voltage to be monitored.	*	-	-	-
c	HT Voltages in three phases & current in each phase.	*	-	-	-
d	Checking the entire cooling system.	*	-	-	-
e	Monitoring the abnormal heat , vibration and sound.	*	-	-	-
f	Working of tripping relays ,its indications and operation of counter.	-	-	*	-
g	General cleanliness of the DG, floor, trench etc. (unwanted, inflammable materials should not be stored inside the rooms)	-	*	-	-
h	Checking the entire fuel system & filling the fuel in the day tank	*	-	-	-
i	Checking the Entire Lubrication system and filling if necessary.	*	-	-	-
j	Checking of Earth pits and its termination to HT Panels.	-	-	*	-
k	Checking the oil, coolant and air filter.	-	-	-	*
l	Checking the entire electrical system.	-	-	-	*