
	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-013
	OCP - INSTALLATION, REPLACEMENT, MONITORING AND MAINTENANCE OF AUTOMATIC POWER FACTOR CONTROLLER (APFC)	Rev. No. /Dt: 00 / 01.12.2021

DOCUMENT CONTROL


Document Number	TPDF02-DIS01-OCP-013	
Title of Document	INSTALLATION, REPLACEMENT, MONITORING AND MAINTENANCE OF AUTOMATIC POWER FACTOR CONTROLLER (APFC)	
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Amendment Details:

Sr.	Issue No.	Rev. No.	Date	Amendment Details	Reviewed by	Approved by
1	1	0	01.12.2021	First Issue	Shilajit Ray Satish Shah	Snehal Shah Abdulrashid Shaikh
2	1	0	01.12.2022	First Review Done (No changes)	Shilajit Ray Satish Shah	Snehal Shah Abdulrashid Shaikh

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1. PURPOSE

- 1.1. Installation, Replacement, Monitoring and Maintenance of APFC Panel

2. SCOPE OF DOCUMENT

- 2.1. The scope of this document is to define a structured activity-level flow for Installation, Removal, Monitoring and Maintenance APFC Panel.
- 2.2. The process document aims to define the guidelines to ensure the process effectiveness as required by the Integrated Management System whenever implemented.

3. FIELD OF APPLICATION

- 3.1. This procedure is used for Installation, Removal, Monitoring and Maintenance APFC Panel in TPL-D's Franchisee areas of Bhiwandi & SMK.

4. FREQUENCY

- 4.1. As and when required

5. AUTHORITIES AND RESPONSIBILITY


- 5.1. The Head of Distribution is responsible for implementation of this procedure for effectiveness.
- 5.2. The Head of HT O&M/Projects at respective locations are responsible for execution of this procedure for effectiveness.

6. REFERENCES

- 6.1. MERC Regulations (with its latest amendments)
- 6.2. Central Electricity Authority (Measures Relating to Safety & Electric Supply) Regulations 2010 (with its latest amendments)
- 6.3. Guideline # TPDF02-DIS01-GDL-001_Guideline for HV Network Design
- 6.4. Guideline # TPDF02-DIS01-GDL-002_Guideline for HV Asset Management
- 6.5. OCP # TPDF02-STO01-OCP-006 (Operational Control Procedure for Handling, Collection, Storage and Management of Hazardous Waste)

7. SPECIFIC COMPETENCY REQUIREMENTS

- 7.1. Technician/GET/Jr.Exe/Exe/AM/M should have Knowledge of
 - (1) Operation of Feeders, Distribution Transformers, Switchgears, Switching & Sub-station equipment
 - (2) Safe working practices and use of PPE
- 7.2. Technician/GET/Jr.Exe/Exe/AM/M having valid authorization from General Manager Distribution shall have authority for electrical isolation and issue of Permit to Work (PTW).

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7.3. As per competency profile and assessment.

8. INTERFACE WITH OTHER DEPARTMENTS/SECTIONS, IF ANY

8.1. Control room / NPC

8.2. Service Providers for material and manpower.

8.3. Store for material issue and reconciliation

9. TOOLS AND TACKLES

9.1. Tool bag.

9.2. Multi meter.

9.3. Short link.

9.4. Earth Discharge Rod / Test Lamp.

10. PERSONAL PROTECTIVE EQUIPMENTS / SAFETY TOOLS

Following PPEs shall be used to carry out work at site.

10.1. Safety shoes.

10.2. Safety helmet.

10.3. LT Hand gloves

10.4. Barricading tape (if required)

10.5. Caution board / “Men at work” sign board (if required)

10.6. Barricading cone (if required)

11. SIGNIFICANT RISK PARAMETERS

11.1. Quality Management System: Low

11.2. Impact on Environment: High

11.3. Health and Safety Risk: High


11.4. Energy Management: Low

11.5. Asset Management Risk: Medium

12. PROCEDURE

12.1. JOB PREPARATION

- (1) List of APFC panel for Monitoring and Maintenance, given by vendor starting of month.

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- (2) Identify substation name, location, type of substation etc. on which APFC Panel to be installed / Replaced
- (3) Visit the site location for prelims of activity to be planned and requirement of necessary tools, manpower and material etc.
- (4) Issue material from store and transport the same at site.
- (5) Ensure that the crew has necessary manpower to carry out the installation/replacement/removal work and all the persons to work at site should have valid I-Card issued by HR department, TPL.
- (6) Prepare Reservation / sub reservation for the material required to carry out the
- (7) installation work.

12.2. PRECAUTIONS

- (1) Barricade the working area by barricading tape if required.
- (2) Working area should be free from slippery material to prevent slipping.
- (3) Aware all persons for nearby live equipment and maintain safe clearance and safety while working.
- (4) Use all required PPEs during execution of the job.
- (5) Before/after isolation of the section ensure the substation supply status from DT / Audit meter.
- (6) Isolation is done through removing fuses from FSP panel and provide “shorting link” at APFC panel side.
- (7) Take permit from concerned person “Permit to Work”
- (8) After isolation, ensure zero potential on equipment where work is to be carried out using suitable device.
- (9) In case of removal of old APFC panel ensure that cable is disconnected from transformer and FSP. To ensure the same; verify the voltage at APFC panel is zero and take continuity of confirmed cable at both ends.
- (10) Provide local earthing on FSP before execution work


12.3. ISOLATION

- (1) For isolation equipment from the system follows the procedure as per OCP No: TPDF02-DIS01-OCP-005 for Distribution Network Isolation and Normalisation as per the switching requirement.
- (2) Authorized person issue “Permit to Work” as applicable to competent person after required isolation and local earthing

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12.4. WORK PROCEDURE

- (1) Commissioning of APFC panel
 - (a) Installations of APFC Panel by grouting on foundation.
 - (b) Provide double earthing to APFC Panel.
 - (c) Make Cable Termination at APFC Panel.
 - (d) Disconnect LT Cable at transformer LT Busbar
 - (e) Provide CT of required ratio and size at transformer LT Busbar.
 - (f) Ensure polarity of CT.
 - (g) Connect CT wire as per their phase sequence.
 - (h) Reconnect LT Cable.
 - (i) Connect cable for APFC Panel at source side in FSP panel through fuse
 - (j) Monitor and note down desired parameter of APFC
- (2) Monitoring and Maintenance of APFC
 - (a) Compare all the parameters (KW, KVA, KVAR, PF) in DT meter and APFC panel meter
 - (b) Check APFC ON/OFF stage visually.
 - (c) Switching “OFF” MCCB at APFC panel
 - (d) Clean APFC Panel with blower if required.
 - (e) If found any abnormality inform to concern executive for shutdown planning if required.
 - (f) If required replace any parts of APFC
 - (g) Make incomer MCCB “ON”
 - (h) Check on controller by test mode / ON-OFF condition for working status.
 - (i) Submit service report to concern department.
- (3) Replacement of APFC panel
 - (a) Verify APFC cable status (connected/disconnected)
 - (b) If disconnected, verify the same by taking continuity and voltage at both end with multimeter.

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- (c) If connected, isolate power supply as per OCP TPDF02-DIS01-OCP-005 for Feeder Isolation and Normalisation
- (d) Disconnection of LT cable of APFC Panel at source side.
- (e) Refer 12.4. (1) Commissioning of APFC Panel for erection of new APFC Panel.
- (4) Site housekeeping (If Applicable)
 - (a) After completion of work remove all packing, waste material and dump, Collect and submit to stores
 - (b) temporary stakes etc.
 - (c) Clean the area of dirt, loose soil etc.
 - (d) Remove caution boards, plastic cones
- (5) LT Capacitor Inspection:
 - (a) Check Type, Make and Size (KVAR) of Capacitor
 - (b) Check Enclosure Condition
 - (c) Check Body Earthing
 - (d) If any other abnormality found it shall be noted down in the service report.


12.5. RESTORATION

- (1) Remove all excess materials from job place.
- (2) Remove local earthing both from LT side as well as HT side wherever it is provided if isolation is done from 22 or 11 KV side of transformer.
- (3) For normalisation of above switching follow the procedure as per OCP No: TPDF02-DIS01-OCP-005 for Distribution Network Isolation and Normalisation.
- (4) If isolation is done through removing fuses from FSP panel then remove “shorting link” and provide HRC Fuse.
- (5) Take clearance from concerned person and Cancel “Permit to Work”
- (6) Switch “ON” the supply.
- (7) Check power available on LT panel.
- (8) Inform about normalisation of switching to control room

12.6. WORK CHECKLIST

- (1) Update entries in Standard Format in SAP/hard copy

12.7. UPDATION

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- (1) Update in GIS / SAP, if applicable.


13. IMPACT ANALYSIS OF SIGNIFICANT RISKS

13.1. QUALITY MANAGEMENT SYSTEM

- (1) Details of Quality Issues involved
 - (a) Improper Handling of equipment
 - (b) Work not done as per OCP.
- (2) Details of Quality Assurance plan
 - (a) Approved Vendor
 - (b) Work Quality Audit

13.2. HEALTH AND SAFETY

- (1) Details of Health and Safety Hazard involved
 - (a) working/travelling in extreme weather condition
 - (b) Animal/ insect bite
 - (c) Use of faulty Tools
 - (d) Negligence of use of safety PPEs / Non usage of PPEs/ Use of faulty PPEs
 - (e) Accident to public due to Working without Area barricading
 - (f) Wrong Methods of lifting material
 - (g) Working in congested area
 - (h) Fall of external object
 - (i) Working in unhygienic area
 - (j) Slips, trips and Falls of Persons
 - (k) Consumer aggression
 - (l) Failure of loading / unloading equipment
 - (m) Electric shock due to improper earthing of welding / Other electrical tools
- (2) Health and Safety Precautions required
 - (a) Ensure that no authorized person should be work at equipment
 - (b) Ensure that zero potential is there at equipment by using detector / multi meter.

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- (c) Use of proper PPEs

13.3. ENVIRONMENT

- (1) Details of Environmental impact
 - (a) Resource Depletion
 - (b) Land Contamination
- (2) Precautions to minimize Environmental impact
 - (a) Ensure material consumption monitoring
 - (b) Ensure that all type of generated waste including hazardous waste should be collected and submitted to stores as per OCP no: TPDF02-STO01-OCP-006.
 - (c) Material reconciliation

13.4. ENERGY MANAGEMENT


- (1) Details of energy use involved
 - (a) Fuel consumption in transportation/ material movement
- (2) Precautions to minimise energy use
 - (a) Ensure Optimum Usage & Turn off the engine when not in use

13.5. ASSET MANAGEMENT

- (1) Details of Asset related risks
 - (a) NIL
- (2) Mitigation plan for asset related risks
 - (a) Work as per OCP

14. LIST OF ATTACHMENTS

Sr	Document /Record Description	Reference No.
1.	Loading, unloading & transportation of material	TPDF02-DIS01-OCP-017

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2.	Deviation Format	TPDF02-DIS00-FOR-001
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***** End of Procedure *****