
	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

DOCUMENT CONTROL


Document Number	TPDF02-DIS01-OCP-014	
Title of Document	ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	
Document owner:	General Manager (HV Cell)	
Prepared by / Modified by	Mr. Amit Magdum Manager HV Cell	07.11.2021
Reviewed by	Mr. Shilajit Ray Mr. Satish Shah Assistant General Manager HV Cell	22.11.2021
Approved by	Mr. Snehal Shah Mr. Abdurashid Shaikh General Manager HV Cell	30.11.2021
Last Reviewed on		01.12.2022

The user of any printed copy of this controlled document is responsible for verifying it is the current version prior to use.

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

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	Ankit Saha Abdulrashid Shaikh

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

1. PURPOSE

- 1.1. Attending oil leakage in Distribution Transformer

2. SCOPE OF DOCUMENT

- 2.1. The scope of this document is to define a structured activity-level flow for Attending oil leakage in Distribution Transformer
- 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 attending oil leakage in Distribution Transformer 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. 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) O&M of Distribution Transformers and its associated 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).
- 7.3. As per competency profile and assessment.

8. INTERFACE WITH OTHER DEPARTMENTS/SECTIONS, IF ANY

- 8.1. Control Room/NPC for Outage and temporary switching Information
- 8.2. Call centre for information to the consumer

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

- 8.3. Store for material issue and return
- 8.4. Service Providers for material and manpower

9. TOOLS AND TACKLES

- 9.1. Tools bag
- 9.2. Oil collecting vessel or tray
- 9.3. Pump and pipe
- 9.4. Switch board (if required)
- 9.5. Digital Multimeter
- 9.6. Test Lamp
- 9.7. Live Line Detector
- 9.8. Discharge Rod & HT, LT Shorting earthing device
- 9.9. DO operating Rod
- 9.10. Illumination arrangement while working in night.
- 9.11. Tarpaulin in rainy seasons


10. PERSONAL PROTECTIVE EQUIPMENTS / SAFETY TOOLS

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

- 10.1. Safety shoes / Gum boot
- 10.2. Safety helmet
- 10.3. Reflective jacket
- 10.4. Insulated hand gloves of 22kV
- 10.5. Face Visor (if required)
- 10.6. Barricading tape (if required)
- 10.7. Caution board / “Men at work” sign board (if required)
- 10.8. Barricading cone (if required)

11. SIGNIFICANT RISK PARAMETRS

- 11.1. Quality Management System: Low
- 11.2. Impact on Environment: High
- 11.3. Health and Safety Risk: High
- 11.4. Energy Management: Low

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

11.5. Asset Management Risk: High

12. PROCEDURE

12.1. JOB PREPARATION

- (1) Check the necessary history of transformer and site inspection report of substation regarding distribution transformer.
- (2) Visit and check details regarding oil leakage whether from LV side, HV side etc.
- (3) Prepare outage or shutdown as per standard procedure.
- (4) Ensure and provide for illumination in sub-station if required.
- (5) Issue necessary materials and transport the same to site.

12.2. PRECAUTIONS

- (1) Working area should be free from slippery material to prevent slipping.
- (2) Use all required PPEs during job.
- (3) Ensure that the breaker, MCCB or SFU is switched off. In case of DO controlling transformer all three Drop out fuses are isolated and removed.
- (4) Instruct attendants to take care that any tools should not fall inside the transformer tank.
- (5) Care should be taken that there should not be any oil spillage / leakage during work execution. Provide Oil collecting vessel or tray below leakage points during oil leakage attending

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 at FSP busbar.

12.4. WORK PROCEDURE


- (1) In case of Pole Mounted, the transformer is to be taken out and same is to be placed on ground. Follow the procedure as per OCP No: TPDF02-DIS01-OCP-018 for Erection of transformer on outdoor Pole Mounted structure.
- (2) Clean transformer with cotton waste to identify exact leakage point.
- (3) If oil leakage from Air release plug of radiators and bottom oil drain valve,
 - (a) Shut down top and bottom radiator valve.
 - (b) Remove oil from bottom oil drain plug of radiator in bucket.
 - (c) Open top air release plug of radiator.
 - (d) Clean all oil sealing gaskets which are sticking to radiator air release plug and

radiator oil drain plug and body.


- (e) Replace fibre or rubber washer with Teflon washer of radiator oil drain plug / air release plug
 - (f) Fill oil from the air release plug.
 - (g) First open bottom radiator valve and then top radiator valve.
 - (h) Check oil in top plate by opening air release plug.
 - (i) If oil not come out from air vent than fill oil in transformer tank.
 - (j) If oil come out from air vent than fill oil in conservator up to the oil level indicator if required.
 - (k) Once oil come out from the air vent than close air release plug tightly and fills oil in conservator up to the oil level indicator.
 - (l) Fit new breather or recondition breather by replacing oil and silica gel if required
 - (m) Clean transformer with cotton waste.
- (4) If oil leakage from Air release plug of top plate
- (a) Remove oil from transformer bottom oil drain valve and down the oil level below the top plate.
 - (b) Open air release plug on the top plate.
 - (c) Clean all oil sealing gaskets which are sticking with top plate body and air release plug.
 - (d) Fit air release plug with Teflon washer after releasing of trapped air
 - (e) Fill oil from conservator by manual oil pump and pipe by keeping air release plug open till the air is coming out from air vent plug.
 - (f) Once oil come out from the air vent than close air release plug tightly and fill oil in conservator up to the oil level indicator.
 - (g) Fit new breather or recondition breather by replacing oil and silica gel.
 - (h) Clean transformer with cotton waste.
- (5) If Oil leakage from Oil level indicator or conservator plate or conservator oil drain plug
- (a) Remove oil from bottom oil drain plug of conservator in oil drum.
 - (b) Open conservator front plate on which oil level indicator is situated.
 - (c) If conservator having welded front plate than open and take out oil level indicator only.
 - (d) Break oil level glass or fibre strip if it is directly sticking with conservator front plate if oil come out from it.

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

- (e) Open and take out oil level indicator if it is fitted with nuts and bolts.
- (f) Clean all oil sealing gaskets which are sticking with conservator front plate, conservator body, oil level indicator and oil drain plug.
- (g) Cut oil level glass or fibre strip as per requirement if glass is broken.
- (h) Select proper size of gasket (Cork-sheet) and cut it as per dimension of conservator front plate and oil level indicator (if it is fitted with nut and bolts) using hole punch and scissors.
- (i) If oil level glass or fibre strip is directly sticking with conservator front plate than its strip is to be stuck using fast sticking adhesive
- (j) Fit oil level indicator if it is fitted with nut and bolts on conservator plate with its appropriate gaskets.
- (k) Clean conservator tank from inside for removing sludge and carbon particles.
- (l) Fit conservator front cover with appropriate gasket.
- (m) Fit conservator oil drain plug with fibre or rubber washer.
- (n) Fill oil from top of conservator.
- (o) Fill oil in conservator up to the oil level indicator.
- (p) Fit new breather or recondition breather by replacing oil and silica gel.
- (q) Clean transformer with cotton waste.
- (6) If oil leakage from Transformer top / bottom oil valve
 - (a) Remove oil from transformer bottom oil drain valve upto level below the leakage point.
 - (b) Open and take out top / bottom valve.
 - (c) Check valve, if found defective, then replace it.
 - (d) Clean all oil sealing gaskets which are sticking with front plug of valve.
 - (e) Select proper size of gasket (Cork-sheet) and cut it as per dimension of front plug of valve using hole punch and scissors.
 - (f) Apply thread seal tap on thread of the front plug thread of valve and thread of the pipe attached with transformer tank on which valve is fitted.
 - (g) Fit top / bottom valve.
 - (h) Fit front plug of valve with appropriate gasket.
 - (i) Fill oil from conservator by manual oil pump and pipe by keeping air release plug open to release the air trapped in between.
 - (j) Once oil come out from the air vent than close air release plug tightly and fills oil in conservator up to the oil level indicator.
 - (k) Fit new breather or recondition breather by replacing oil and silica gel.

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

- (l) Clean transformer with cotton waste.
- (7) If oil leakage from transformer LT/HT cable box or terminal bushings
 - (a) Drain oil from bottom oil drain valve or directly from the tank using oil pump till the oil level goes down in main transformer tank below the opening for mounting LT/HT bushing
 - (b) Open LT/HT cable box cover or lift canopy or open canopy if available.
 - (c) Remove top plate by lifting top plate manually and put it on the floor/ground.
 - (d) Open bushings and metal parts.
 - (e) Clean all oil sealing gaskets which are sticking with bushings and metal parts.
 - (f) If any bushing is broken or metal parts is burnt out then replaced it.
 - (g) Clean contact area of metal parts where Cable lugs are fixed using polish paper.
 - (h) Select proper size of gasket (Cork-sheet) and cut it as per dimension of bushings and metal parts using hole punch and scissors.
 - (i) Fit bushings and metal parts with suitable gasket to prevent oil leakage.
 - (j) Check that the metal part of any phase is not touching with body of the transformer.
 - (k) Replace top plate gasket by new gaskets as per the requirement.
 - (l) Fill same oil up to top plate of the transformer using oil pump.
 - (m) Check any oil leakage from any gaskets of bushings or metal parts.
 - (n) If oil leakage observed from gaskets of any part, remove oil and repair it and refill oil otherwise proceed as follow.
 - (o) Put top plate on transformer and fit it properly with gasket.
 - (p) Fill oil in the conservator tank.
 - (q) Open air release plug at the time of oil topping of Transformer in conservator tank for releasing air residing between the oil level and top plate.
 - (r) Fill oil up to oil level indicator indicated on conservator.
 - (s) Check there is no leakage from the top plate.
 - (t) Fit new breather or recondition breather by replacing oil and silica gel.
 - (u) Clean transformer with cotton waste.
- (8) Site Housekeeping
 - (a) After completion of work remove all packing, waste material and dump, Collect and submit to stores.

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

- (b) Clean the whole area.
- (c) Remove barricades, temporary stakes etc.
- (d) Ensure the backfield areas are level with ground surface

12.5. RESTORATION

- (1) Remove shorting & earthing link from HT as well as from LT side. Remove LOTO / Padlock and caution board from respective location.
- (2) Take clearance from concerned person and Cancel “Permit to work”
- (3) Shift all the manpower and tools and tackles from the site.
- (4) Remove excess material & scrap from the job area.
- (5) For normalisation of above switching follow the procedure as per OCP No: TPDF02-DIS01-OCP-005 for Distribution Network Isolation and Normalisation.
- (6) Check power available on FSP/DT Meter.
- (7) Inform Control room regarding normalisation of section.
- (8) Remove the temporary switching from the control room giving all relevant details.

12.6. WORK CHECKLIST

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

12.7. UPDATION

- (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) Incompetent manpower (Wrong / Improper handling of equipment's of distribution transformer)
- (2) Details of Quality Assurance plan
 - (a) Work Quality Training
 - (b) Effective supervision
 - (c) Penalty mechanism

13.2. HEALTH AND SAFETY


- (1) Details of Health and Safety Hazard involved
 - (a) working/travelling in extreme weather condition
 - (b) Working in congested area
 - (c) Animal/ insect bite

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

- (d) Negligence of use of safety PPEs / Non usage of PPEs/ Use of faulty PPEs
- (e) Slips, trips and Falls of Persons
- (f) Working in unhygienic area
- (g) Fall of external object
- (h) Contact with sharp edges
- (i) Fall of person from Height
- (j) Skin contact with hot oil
- (k) Eye contact with oil
- (l) Consumer aggression
- (m) Hit by another vehicle during site visit
- (n) Flash Over during switching operation
- (o) Contact with Live terminal/ cable/ wire/ busbar
- (p) Hit by handles/tools due to slippage/ mishandling
- (q) Accident due to improper isolation
- (2) Health and Safety Precautions required
 - (a) Follow the permit to work & OCP
 - (b) Use of proper PPEs
 - (c) Regular housekeeping practices

13.3. ENVIRONMENT

- (1) Details of Environmental impact
 - (a) Resource depletion
 - (b) Land contamination
 - (c) Land pollution
- (2) Precautions to minimize Environmental impact
 - (a) Ensure that all persons working at site are aware about the significant environmental impacts
 - (b) Ensure that there is no any spillage/leakage of oil during handling and refilling of oil in distribution transformer. If happen immediately clean the areas with cotton waste/sand, collect the cotton waste from site.
 - (c) Ensure that there is no any ignition source present near to the oil storage area.
 - (d) Used oil will collect in empty barrels and provide identification tag and submit to the store.

	Torrent Power Ltd. – Distribution Franchise	Doc. No.: TPDF02-DIS01-OCP-014
	OCP - ATTENDING OIL LEAKAGE IN DISTRIBUTION TRANSFORMER	Rev. No. /Dt: 00 / 01.12.2021

- (e) Provide containment tray/vessel & cotton waste to collect spilled oil on site if required & deposit the same in Stores.
- (f) 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

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) Loss of Equipment's
 - (b) Frequent Small Duration Forced Outages
 - (c) Sustained Forced Outage requiring Major Repair
 - (d) Frequent Planned Outages
 - (e) Overloading of equipment
 - (f) Mishandling by handling equipment
 - (g) Derating / Ageing
- (2) Mitigation plan for asset related risks
 - (a) Work as per OCPs
 - (b) On job training

14. LIST OF ATTACHMENTS

Sr	Document /Record Description	Reference No.
1	Distribution substation inspection report format	TPDF02-DIS01-CHK-001-F04
2	Permit to Work (PTW)	TPDF02-SAQ02-OCP-005-F02

***** End of Procedure *****