DOCUMENT CONTROL

Document Number	**TPDF02-DIS01-OCP-023**	
Title of Document	**RAISING/LOWERING HT OUTDOOR CABLE TERMINATION**	
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1	1	0	01.12.2021	First Issue	Shilajit Ray Satish Shah	Snehal Shah Abdulrashid Shaikh
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1. PURPOSE

1.1. Raising/ Lowering 11/22 kV Outdoor Cable Termination on 11/22 kV Overhead line.

2. SCOPE OF DOCUMENT

2.1. The scope of this document is to define a structured activity-level flow for Raising/ Lowering 11/22 kV Outdoor Cable Termination on 11/22 kV Overhead line

2.2. The process document aims to define the guidelines to ensure the process effectiveness as required by the Integrated Management System

3. FIELD OF APPLICATION

3.1. This procedure is used for Raising/ Lowering 11/22 kV Outdoor Cable Termination on 11/22 kV Overhead line 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 Department is responsible for Execution & implementation of this procedure for effectiveness

6. REFERENCES

6.1. Guideline # TPDF02-DIS01-GDL-003_Guideline for Applicable Legal Requirement

7. SPECIFIC COMPETENCY REQUIREMENTS

7.1. Technician/GET/Jr. Exe/Exe/AM/M should have Knowledge of

(1) O&M of Substation equipment

(2) Safe working practices and use of PPE

7.2. Technician/GET/Jr. Exe/Exe/AM/M shall have authority for electrical isolation and issue of PTW

8. INTERFACE WITH OTHER DEPARTMENTS/SECTIONS, IF ANY

8.1. Control room/NPC for outage information

9. TOOLS AND TACKLES

9.1. Sling /nylon ropes, Cotton ropes.

9.2. Ladder as per site requirement.

9.3. Tool bag

9.4. Single/Double Sheave Rope Pulley Assembly if required

9.5. Live line detector

9.6. Telescopic Earth Rod

9.7. Discharge rod

9.8. Short link

9.9. Torch if required

9.10. DO Operating Rod

9.11. ELCB/ RCCB as protective device, if required when of direct supply for any external appliance/ Apparatus

9.12. Torch

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. Insulated hand gloves of 11/22kV class.

10.4. Full body harness with lanyard/ double hook

10.5. Reflective jacket

10.6. Ladder

11. SIGNIFICANT RISK PARAMETERS

11.1. Quality Management System: Low

11.2. Impact on Environment: Low

11.3. Health and Safety Risk: High

11.4. Energy Management: Low

11.5. Asset Management Risk: Low

12. PROCEDURE

12.1. **JOB PREPARATION**

(1) Identify data on HT Cable terminations

(a) Location

(b) Cable type (s)

(c) Cable size(s)

(d) Required accessories like Lugs, HT Terminal protector, HV bus bar insulating tape.

(2) Plan area where material and tools may be stacked during work.

(3) Ensure and provide for adequate access, working space and illumination.

(4) Inform all above details to allocated person.

(5) Issue the material & Transfer material and tools to site

(6) Ensure that the contractor /technician gang has necessary manpower to carry out the job and all the persons to work at site should have valid Identity card issued by HR department, TPL.

12.2. **PRECAUTIONS**

(1) Barricading the working area by barricading tape with appropriate sign board indicating the hazard shall be displayed near the barricade.

(2) Aware all persons for nearby live equipment and maintain safe clearance and safety while working.

(3) Use all required PPEs during execution of the job.

(4) Following steps to be followed for working at height.As per OCP TPDF02-SAQ02-OCP-007

(a) Person who has to climb on the pole must use full body harness with lanyard which is be hooked & locked properly on pole at convenient height where the person has to perform the job. a

(b) Ladder is to be erected in safe working condition and its top end is to be tide with pole by means of rope.

(c) All the materials should be lifted or lowered by means of hand line only and nothing should be thrown up by the ground helper or thrown down by the lineman. As there is tendency, many times on the part of the work man to throw smaller items such as spanner, bolts, nuts etc. from the ground to the top or from the top to the ground to save the labour and time which may lead to an accident hence it should be strictly avoided.

12.3. **ISOLATIONS**

(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

12.4. **WORK PROCEDURE**

(1) Raising & Connection of HT Outdoor cable termination on pole.

(a) Excavate the earth and open the cable coil buried in the ground of which the termination is to be raised.

(b) Anchor the one of the pulleys of double sheave rope pulley assembly on top pole fitting & release the rope so that lower pulley will come on ground.

(c) Tide the cable clamp with small piece of cotton rope & make the loop in between so that hook of the lower pulley can be anchored in the same.

(d) Pull the rope through above double sheave pulley assembly.

(e) Mount the cable clamp on the pole as well as on the channel fittings as per the pole structure fittings. Release the pulley.

(f) Tide the cable below the trifurcation area with small piece of cotton rope. Make the loop in between so that hook of the lower pulley of double sheave pulley assembly can be anchored in the same.

(g) Anchor the hook of lower pulley in the loop of rope.

(h) Pull the rope through above double sheave pulley assembly.

(i) While pulling the cable see that bend in the cable should not be less than its allowable bending radius.

(j) When the termination comes to the pole height as per the site requirement, clamp the cable just below the trifurcation area of outdoor termination with cable clamp.

(k) Give the proper bend & shape to the remaining length of the cable below the clamping arrangement such that cable can be clamped on the pole & entire load of the same will not come on cable clamp mounted just below the outdoor termination.

(l) If the length of cable loop is more than remaining length of cable should be properly looped & is to be buried in the ground at required depth. The pit is then to be backfilled with excavated earth. After covering cable coil by @ 100 mm with excavated earth provide protection on the coil. Remaining pit is again back filled with earth. Rammed back filled earth.

(m) Take the measurement of jumper wires for respective phase

(n) Bolt earthing strips to one of the cable clamps.

(o) Connect Cable & jumper, as per phasing, with required size of nut, bolts & washers.

(p) Apply insulation tape over lug.

(q) Provide caution board on pole.

(r) Provide name plate/painted on the outdoor HT termination showing the respective location/identification/substation name.

(2) Disconnection & lowering of HT Outdoor cable termination from Overhead line Pole

(a) Remove the HT jumper and earmark the respective phase on outdoor termination which is to be lowered.

(b) Anchor the one of the pulleys of double sheave rope pulley assembly on top pole fitting & release the rope so that lower pulley will come near to the height of the outdoor termination where it is being clamped.

(c) Tide the cable below the trifurcation area with small piece of cotton rope. Make the loop in between so that hook of the lower pulley of double

sheave pulley assembly can be anchored in the same.

(d) Anchor the hook of lower pulley in the loop of rope.

(e) Pull the rope through above double sheave pulley assembly.

(f) Take the load of cable on the pulley & disconnect the cable from the cable clamp.

(g) Lower the cable slowly so that cable will come on ground.

(h) Give the proper bend & shape to the remaining length of the cable below the clamping arrangement such that cable will not be damaged from the bend itself.

(i) If the new outdoor termination is to be made, then check the length of cable loop and if it is not sufficient either

I. New piece of cable is to be laid & then new joint & termination should be made for connecting the same with the system.

II. If possible rearranging clamping arrangement on the pole structure so that margin in cable loop can be created to raise the cable after making re-termination.

(j) Shorting all three phase of outdoor termination which is being lowered.

(k) Place the board / tag it with proper remarks

I. Showing the purpose of lowering the outdoor termination

II. To which substation the cable is connected.

III. The name of Engineer who has disconnected & lowered the outdoor termination.

(3) Site housekeeping

(a) Remove all packing, waste material and dump, Collect & submit to stores

(b) Remove barricades, temporary stakes etc.

(c) Clean the area of dirt, loose soil etc.

(d) Ensure the backfilled areas are level with ground surface.

(e) Remove caution boards, traffic bollards (plastic cones).

12.5. **RESTORATION**

(1) Remove local earthing made through shorting link.

(2) Remove the telescopic earthing rod from the line.

(3) Remove earthing connection of telescopic rod.

(4) Climb down safely using ladder.

(5) Ensure that nobody is working on the line.

(6) Ensure everybody has come down to ground and ladders removed.

(7) Take clearance from concerned person and Cancel "Permit to Work"

(8) For normalisation of above switching follow the procedure as per OCP No: TPDF02-DIS01-OCP-005 for Distribution Network Isolation and Normalisation.

(9) Check power available on FSP/DT Meter

(10) Inform Control Room regarding normalization of section & any modification if any.

12.6. **WORK CHECKLIST**

(1) Update entries in Standard Format as mentioned in List of attachment.

12.7. **UPDATION**

(1) Not Applicable

13. IMPACT ANALYSIS OF SIGNIFICANT RISKS

13.1. **QUALITY MANAGEMENT SYSTEM**

(1) Not applicable

13.2. **HEALTH AND SAFETY**

(1) Details of Health and Safety Hazard involved

(a) Pick-axe on live cable

(b) Contact with sharp edges

(c) Hit by Excavation tool

(d) Penetration of dust particles in eyes during excavation

(e) Working in bending position / Awkward Posture

(f) Excessive work load

(g) Ingress of polluted water in excavated pit

(h) Contact with Live terminal/ cable/ wire/ busbar

(i) Use of faulty Tools

(j) Negligence of use of safety PPEs / Non usage of PPEs/ Use of faulty PPEs

(k) Flash Over during switching operation

(l) Poor illumination

(m) Flash over during connection-Disconnection

(n) Accident to public due to working without Area barricading

(o) Road/RCC breaking activity by JCB Machin or Road breaker - Exposure to continuous Hand-arm & full-body vibrations

(p) Road/RCC breaking activity by JCB Machin or Road breaker - Exposure to continuous Noise

13.3. **ENVIRONMENT MANAGEMENT SYSTEM**

(1) Not applicable

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) Not applicable

14. LIST OF ATTACHMENTS

Sr	Document /Record Description	Reference No.
1	Permit to Work (PTW)	TPDF02-SAQ02-OCP-005-F02
2	Height work permit	TPDF02-SAQ02-OCP-007-F01

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