

Power Grid Corporation of India
Limited
Asset Management Department



LINEMAN DIWAS-2025

Hotline Maintenance of Transmission Lines

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Introduction of Hotline Maintenance

- **Hotline maintenance also called Live-line working involves maintenance, repair or replacement activity carried out on a live and operational line or switchyard apparatus using approved techniques and equipment.**
- **It is the preferred method of maintenance where system integrity, system reliability, and operating revenues are at a premium and removal of circuit is not acceptable.**
- **HLM ensures the reliability and continuity of electricity supply without the need for service interruptions**

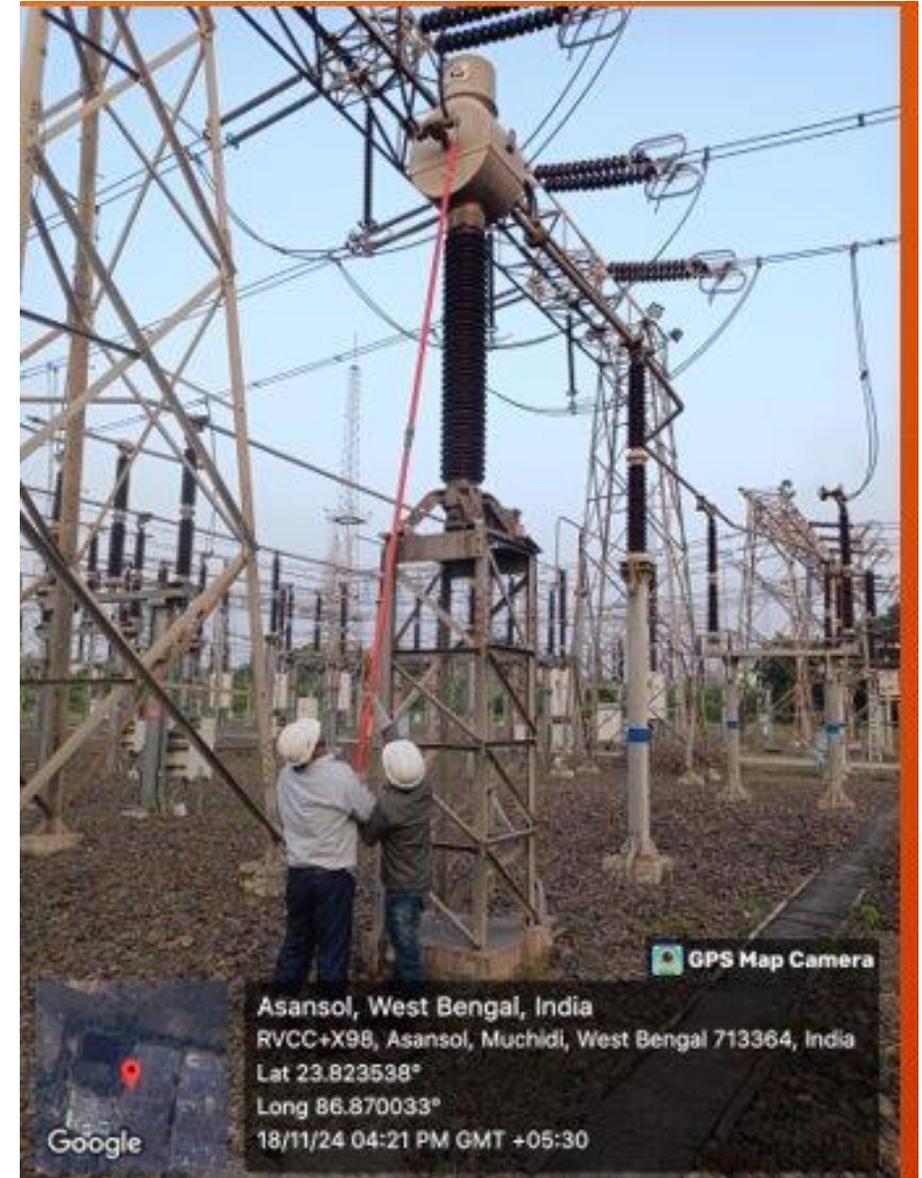
Advantages of Hotline Maintenance

- **Minimization of Power Outages**
- **Cost Efficiency**
- **Increased System Reliability**
- **Faster Response Time**
- **Improved Safety & Efficiency**
- **Better Long-term System Performance**

Different Methods used for Hotline Maintenance

1. Hot Stick Technique

- First hotline maintenance method developed using hot stick.
- Here the lineman performs the works using auxiliary tools attached to the tip of insulating hot sticks.
- This method allows the work to be performed at any voltage level.
- When working using the Hot Stick Method, the lineman must rigorously observe and respect the minimum phase-to-phase and phase-to-ground safety distances



- The insulating pole/ Hot-stick is provided with a polyurethane foam core that avoids humidity and dust absorption and condensation.
- Its external construction is made of highly treated fiberglass, impregnated with an epoxy resin of special constitution, ensuring a high dielectric strength.



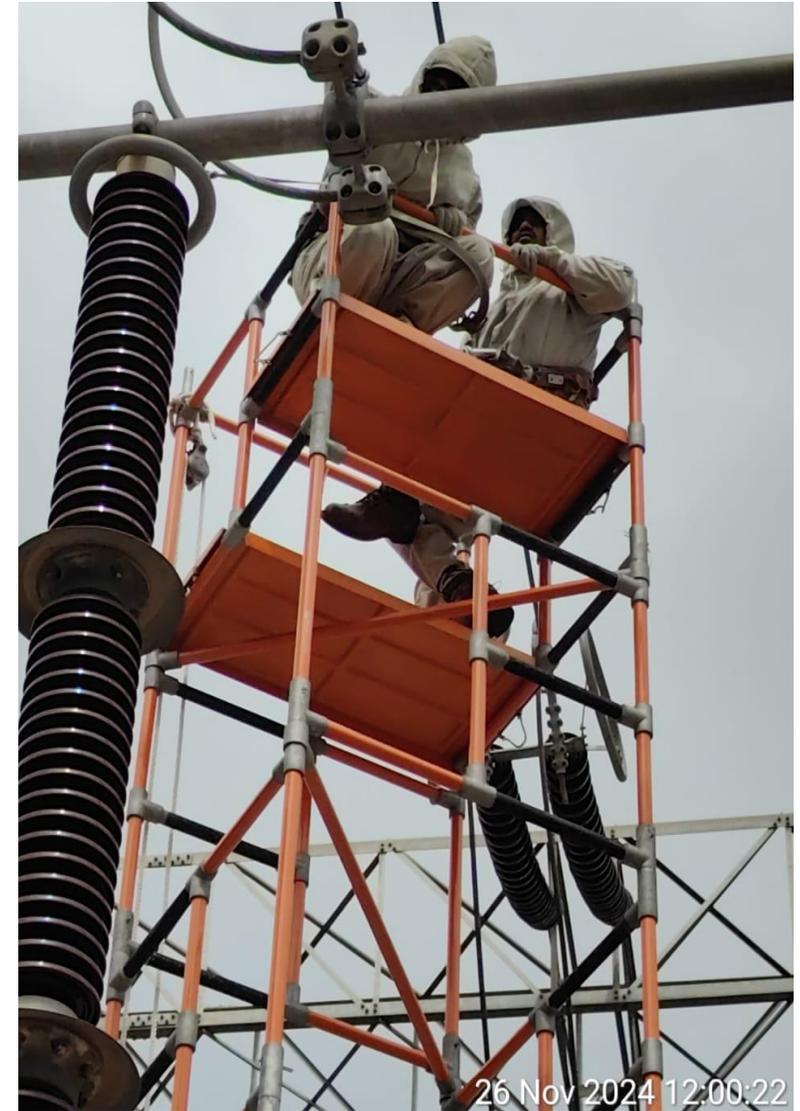
Different Methods used for Hotline Maintenance

2. Bare- Hand Method

- Bare hand method is based on Faraday's cage principle which consists in having the lineman in direct electrical contact with an energized overhead line.
- The personnel might work alongside the lines, from a platform that is suspended from them, or may sit or stand directly on the line itself.
- In all cases, the personnel's body is maintained at the same voltage as the line.
- In order to shield from electromagnetic field effect, lineman uses a conductive suit made of special material. Only the face of the lineman remains uncovered.



- The conductive Suit allows the lineman to equalize potential with the electrical field of the energized system where the maintenance works is required to be performed.
- Conductive Suit is made of high technology fabric based on aramid and stainless steel micro-fibres with reinforced sewing.
- Similar to the Hot Stick Method, the Bare-Hand Method requires minimum phase-to-phase and phase-to-ground safety distances to be strictly observed.



Different Methods used for Hotline Maintenance

3. Aerial Work Platforms (AWPs)

- Aerial platforms or bucket trucks are used to lift personnel and equipment into position near energized lines.
- Aerial platforms provide stable and insulated platform for personnel, allowing them to work at heights safely.
- AWP can be used for 360° rotation with articulated boom, suitable for maintenance work on overhead energized systems.



Hotline Maintenance using Aerial Work Platforms (AWPs)



Precautions for Hotline Maintenance of Transmission Lines

- Only specially trained and certified personnel is allowed for HLM works.
- Specially designed insulated tools to be used for HLM works.
- Arc flash protective clothing
- Proper equipment setup and maintenance
- Clear Communication and coordination
- Emergency Response plan
- Working under proper weather condition
- Monitoring and detection of Electrical hazards.
- [CEA Safety Regulation-2023](#) P-147

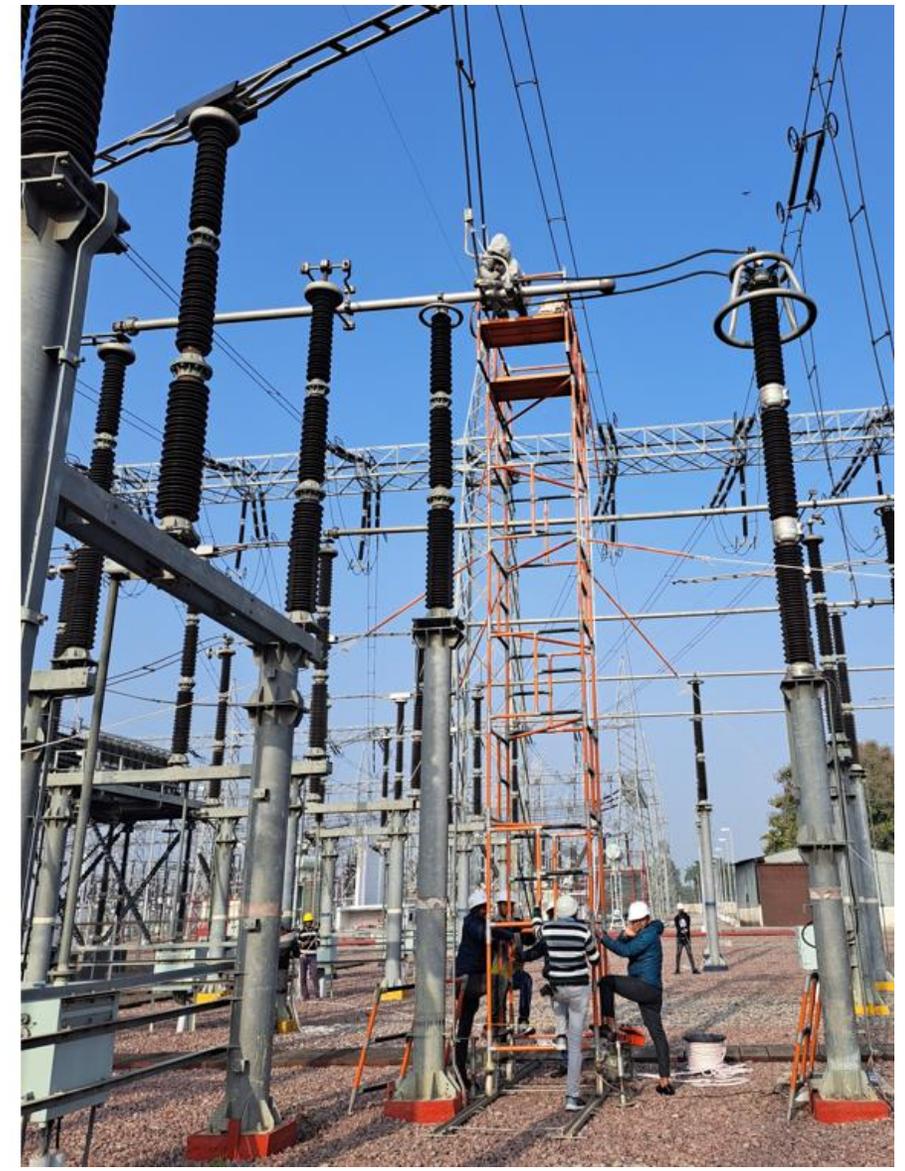
Handling of electric supply lines and apparatus [See sub-regulation (3) of regulation (21)] Part-I

Safe Working Distance: -

The following safe working distances shall be observed for hot line maintenance operations:

Phase to Phase	Safe Clearance
kV	Metre
11	0.61
33	0.71
66	0.91
110	1.02
132	1.07
220	1.52
400	2.13

Offline Maintenance (OMM) of Transmission Lines





Thank You