Session: Introduction to PPE and T&P

Learning Objectives	Evaluation Criteria
Explain what safety PPE, tools and plants are, their purpose and their uses	Interactive Questioning

Duration 15 Minutes

Resources PowerPoint Presentation, Whiteboard, Markers, Screen and Projector

Facilitator's Notes In this session, use video snippets to take the participants through an interactive presentation on the Personal Protection Equipment or PPE, tools and plants that linemen use for safety while working.

End of Note

1. Tell:

Welcome to the video presentation on "Introduction to Personal Protective Equipment (PPE), and Tools and Plants (T&P).

Facilitator's Note:

Welcome the participants and give a brief overview on the session.

Facilitator's Notes:

- Display the slide
- Read out the objectives and ask learners to note them
- Inform them that they will be asked questions during the session

End of Notes

2. Tell:

By the end of this session, you will be able to explain what safety PPE, tools and plants are, their purpose and their uses.

3. Tell:

This session is about safety PPE, tools and plants.

Ask:

- What do you mean by PPE?
- What is the equipment under PPE?
- What are their uses?
- Why should we use safety PPE while working?

Facilitator's Notes:

- Display the slide
- Ask questions one after the other

- Give some time to participants for responding
- Encourage them to come up with more answers
- Capture their responses on the whiteboard
- Appreciate the responses

End of Notes

4. Tell:

PPE are the safety equipment we wear and use for our safety from any injury or accident while working. Hence, these are called “Personal Protective Equipment”.

Safety tools are those that ensure our safety while carrying out work on power lines. They include HV and LV testers, discharge rod, chain, shorting clips, ladders, rope, Danger and Caution signboards, Do Not Operate tags, safety cones, caution tape and so on.

We will also discuss the tools and tackles that power distribution companies commonly use.

Let us start with PPE.

5. Tell:

PPE or Personal Protective Equipment consists of many items. In the power sector, we mainly use six items of such equipment, which are necessary for the linemen to carry out their work safely.

Facilitator’s Note:

Click to play the video.

Tell:

Let us now learn the details of each of the equipment.

6. Ask:

Why do we need to wear a helmet while working?

Possible Responses:

- To protect our head from injuries
- For the safety of head

Tell:

Yes! That’s correct. The outer coating of the safety helmet is hard. This protects the head from injuries.

Facilitator’s Note:

Continue to play the video.

7. Tell:

Visor protects your face and eyes from sharp tiny objects that fly out while drilling walls.

Facilitator’s Note:

Continue to play the video.

8. **Tell:**

Here, you can see the full body safety harness. It is secured below the waist, the chest and the thighs.

When seen from behind, you can notice that the belt of the safety harness protects the waist and also prevents spinal injuries.

Facilitator's Note:

Continue to play the video.

9. **Tell:**

The belt of the safety harness protects the waist against spinal injuries.

Facilitator's Note:

Continue to play the video.

10. **Ask:**

What are the uses of shoes?

Possible Responses:

- Useful while climbing
- Prevent shock from any electric leakage

Tell:

That's correct! Safety shoes protect the lineman from electric shock in case there is power leakage from the pole or ladder that he is climbing.

Facilitator's Note:

Continue to play the video.

11. **Tell:**

These are the rubberised safety gloves, which safeguard the lineman against electric shocks.

Facilitator's Note:

Continue to play the video.

12. **Tell:**

Let us next look at the special fireproof jacket. It has shields on the chest and hands for safety of linemen who are working in front of a live line for operational and other purposes.

Facilitator's Note:

Continue to play the video.

Tell:

We will next learn about Tools and Plants (T&P).

13. **Tell:**

While working during nights, a lineman must carry a torch with high beam light.

Line tester is used to check the LT or HT supply present in the line or wires.

After confirming with the help of HV or LV tester that the line is dead, the line is discharged to the earth with the help of a discharge rod.

Facilitator's Note:

Click to play the video.

14. **Tell:**

Earth connecting lead is used to discharge the HT or LT line.

Earthing or grounding chain is used for creating a safety zone after discharging the line.

Open-ended spanners are used to open or tighten any nuts and bolts.

Facilitator's Note:

Continue to play the video.

15. **Tell:**

Screwdrivers are used to remove or fix any screws.

Hacksaw is very important for a lineman when a need arises to cut something. Adjustable spanners are used when open-ended spanners cannot be used for opening nuts and bolts.

Facilitator's Note:

Continue to play the video.

16. **Tell:**

Hammers are used for hammering items wherever required.

Sockets should not be fixed with a hammer. They should only be punched using the crimping machine.

Facilitator's Note:

Continue to play the video.

17. **Tell:**

Let us now look at a few other tools used for maintenance of lines.

The coloured tape is used based on the phase the lineman is working on. HT tape is an important item that a lineman uses. CRC is used to remove carbon deposits wherever the equipment is carbonised.

Facilitator's Note:

Click to play the video.

18. **Tell:**

Three types of straight ladders are used in electrical work.

1. Wooden ladder

2. Aluminium ladder
3. Fibre glass ladder

Facilitator's Note:

Continue to play the video.

19. Tell:

HV and LV tester is a protective instrument, which indicates an alarm from a distance of 5 metres in case of live HV and LV lines.

Facilitator's Note:

Click to play the video.

20. Tell:

Discharge rod is an insulated rod with an extension rod. It has a Resistance or Corona capsule at the end, whose edge is connected with an earthing lead.

Facilitator's Note:

Click to play the video.

21. Tell:

Status of the line voltage on the danger board should be mentioned as per requirements of safety under CEA.

Facilitator's Note:

Click to play the video.

22. Tell:

Safety cones are usually conical markers that are placed on roads or footpaths to redirect traffic safely.

Facilitator's Note:

Click to play the video.

23. Tell:

Combination pliers are used for cutting, removing insulation and joining and twisting electric wires and cables on power lines.

Adjustable wrench is used to open and close nuts and bolts in case a spanner of the right size is not available.

Facilitator's Note:

Click to play the video.

24. Tell:

Pipe wrench is used to open or close conduits, GI pipes and valves.

Measuring tape is used to measure the length of wires, cables and space.

Facilitator's Note:

Continue to play the video.

25. Tell:

Ratchet with drill bit is used to make holes in wooden cross arms and wooden cleats.

Electric drilling machine is a portable electrical power tool used for drilling.

Facilitator's Note:

Continue to play the video.

26. Tell:

Bench vice is used to grip an object or element on which a job is being done. It has a base plate, fixed jaw and moving jaw.

Chain pulley is a pulley with depressions or projections on the periphery of its wheel, which fit the links of a chain.

Facilitator's Note:

Continue to play the video.

27. Tell:

Tripod is a combination of 3 to 4-metre long, 40 mm GI pipes hinged at the upper end.

Ratchet device consists of a bar or wheel, with a set of angled teeth that allow motion only in one direction.

Facilitator's Note:

Continue to play the video.

28. Tell:

Crow bar is used to open the wooden slab of a cable drum and for hooking the drum on the wheel while laying cables and conductors.

Pickaxe is used to break the hard soil before digging a trench or pit.

Facilitator's Note:

Continue to play the video.

29. Tell:

Hoe is used for digging the soil while preparing a cable trench or digging a pit to erect a pole.

Shovel is used for digging, lifting and moving materials, such as soil, gravel, snow and sand.

Facilitator's Note:

Continue to play the video.

30. Tell:

Handcart is used for local transportation of materials, tools and tackles from the site store to the workplace.

Twisting wrench is used for twisting and tightening the end of overhead conductors or ACSRs over shackle insulators.

Facilitator's Note:

Continue to play the video.

31. Tell:

Cable rollers are used for pulling cables. They enable easy movement and flow of the cable being pulled during the laying of cables. The rollers are of two types:

- Angle roller and
- Straight roller

Facilitator's Note:

Continue to play the video.

32. Tell:

Phase tester is used to identify or test the phase or a live or hot or positive wire or conductor.

Nose pliers are used for cutting and holding pliers to bend, re-position or snip wires.

Facilitator's Note:

Click to play the video.

33. Tell:

An electrician's knife comprises an integral thick insulation and a substantially flat tube, which serves as a sheath for receiving the cutting blade.

Chisel is a metal tool with a flat, sharp end that is used to cut and shape a solid material.

Facilitator's Note:

Continue to play the video.

34. Tell:

A file is a tool, usually made of hardened steel with cutting ridges, for forming or smoothing surfaces, especially of metal.

A wood saw is used to cut pieces of wood into different shapes.

Facilitator's Note:

Continue to play the video.

35. Tell:

Centre punch is a metal rod tool with a conical point for making indentations. This allows a drill to make a hole at the same spot without slipping.

Line vice is used in overhead systems to catch, grip and sag the conductors.

Facilitator's Note:

Continue to play the video.

36. Tell:

A draw tong or Dags is used to draw an overhead conductor during line erection. It is also utilised for fitting the pin insulator over newly erected poles and maintaining the sag between lines.

Facilitator's Note:

Continue to play the video.

Tell:

In this video presentation, you have seen Personal Protective Equipment (PPE), and Tools and Plants (T&P).

Key Learning Outcomes

37. Tell:

Let us quickly recollect the key points of this session.

In this session, you have learnt that:

- PPE is the safety equipment we wear and use for our safety from any injury or accident while working
- Safety tools ensure a lineman's safety while working on power lines
- The six main items of equipment necessary for linemen to carry out their work are:
  - Safety helmet
  - Visor
  - Full body harness
  - Insulated safety shoes
  - Insulated rubber gloves and
  - Safety reflective jacket
- Tools and plants of a lineman include battery, line tester, discharge rod and so on