














Session: Single-Phase Energy Meter Installation








Learning Objective	Evaluation Criteria
Explain the process of installing a single-phase energy meter at the consumer's premises	<ul style="list-style-type: none"> Interactive Questioning Role-plays

	Duration	60 Minutes
	Resources	PowerPoint Presentation, Whiteboard, Markers, Screen and Projector
	Facilitator's Notes	In this session, you will take the participants through an interactive presentation with video snippets on the process of installing a single-phase energy meter at the consumer's premises.









End of Notes

		1.	<p>Tell:</p> <p>Welcome to the video presentation on 'Single Phase Energy Meter Installation'.</p> <p>In this presentation, we will look at the process of installing a single-phase energy meter at the consumer's premises.</p>
			<p>Facilitator's Notes:</p> <ul style="list-style-type: none"> Display the slide Read out the objectives and ask learners to note them Inform them that they will be asked questions during the session <p>End of Notes</p>
		2.	<p>Tell:</p> <p>By the end of this session, you will be able to explain the process of installing a single-phase energy meter at the consumer's premises.</p> <p>Let us see the basic preparation to start with Single-Phase Energy Meter Installation.</p>
		3.	<p>Tell:</p> <p>In a single-phase energy meter installation, the lineman has to fix the meter box at an appropriate height and at the place suggested by the consumer. Usually, it is fixed at the entry point of the consumer's residence, so that the meter reader can record readings easily at any point of time.</p> <p>The lineman must also connect the meter to the LT distribution box installed on the pole with the service line cable at the customer's end.</p> <p>The rating of the energy meter and service cable is determined by the sanctioned load.</p> <p>There are certain processes to be followed and precautions taken while installing a single-phase meter.</p> <p>Let us now look at these processes and the various steps of energy meter installation in detail.</p>
		4.	<p>Tell:</p> <p>The first step in the process is visiting the customer's place and greeting the</p>









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			<p>customer.</p> <p>The supervisor goes to the customer's location to confirm his identification and address.</p> <p>Let us look at the conversation between them with the help of a small activity.</p>
Activity			
		5.	<p>Facilitator's Notes:</p> <ul style="list-style-type: none"> • Randomly pick up any two participants or ask them to volunteer • Tell them to enact the role-play • Provide the script required • One participant acts as a supervisor and the other participant enacts as a customer • Give them: <ul style="list-style-type: none"> ◆ Two minutes for preparation ◆ Five minutes to enact the role-play • Guide them wherever required <p style="text-align: right;">End of Notes</p>
			<p>Tell:</p> <p>After identifying the exact location for the energy meter to be installed, you need to gather all the material and the required tools and tackles.</p> <p>Let us next look at the materials, accessories, PPEs and tools required before taking up the installation task.</p>
		6 – 7.	<p>Tell:</p> <p>The accessories and equipment that the crew has to carry are:</p> <ul style="list-style-type: none"> • Tray • Toolbox • Rubber mat • Meter box • Drill machine and • Service cable <p>Let us now watch a video to know about some accessories and how they are used.</p> <p>Facilitator's Note:</p> <ul style="list-style-type: none"> • Play the video <p>Tell:</p> <p>Besides these accessories, a lineman has to take a few safety measures while mounting on the pole. Let us look at them.</p>
		8.	<p>Tell:</p> <p>A lineman mounts the pole to connect the cable to the distribution box on the pole. Hence, he has to take certain safety measures. He has to carry a safety harness belt with double lanyard and safety pouch to carry tools. Let us watch a video on how to use these accessories for protection.</p> <p>Facilitator's Note:</p>











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			<p>Play the video.</p> <p>Ask:</p> <p>Did you see the way the lineman wore the safety harness belt?</p> <p>Possible Response:</p> <ul style="list-style-type: none"> • Yes <p>Facilitator's Note:</p> <p>If required play the video again</p>
		9.	<p>Tell:</p> <p>A lineman makes four holes in the wall with the help of the drill machine to fix the energy meter box.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>
		10.	<p>Tell:</p> <p>A lineman cuts the cable sheath at 25cm from end with hacksaw and removes the insulation with knife. Armoured wires are exposed after removing the outer sheath. The same will be cut up to the outer sheath.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>
		11.	<p>Tell:</p> <p>Here, the lineman is loosening the terminal screws of the energy meter. He will then fix the energy meter into the box.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>The next step is to manage the accessories required to support the cable.</p>
		12-13.	<p>Tell:</p> <p>A cable has to be connected to the meter box and to the distribution box. Let us look at the process for laying the cable on the wall.</p> <p>Facilitator's Note:</p> <ul style="list-style-type: none"> • Play the video <p>Tell:</p> <p>In this video, we have seen that a lineman has to:</p> <ul style="list-style-type: none"> • Drill holes to clamp the cable with saddles • Insert the cable into the meter box • Connect earth wire with jubilee clip • Clamp the cable on the wall with saddles • Hit wooden plugs into the holes on the wall • Clamp the cable on wall with saddles • Place incoming cable connections









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		<ul style="list-style-type: none"> • Provide service line connections • Fix the out-going line from the meter terminal <p>As you saw, we have connected the earth wire and used saddles to clamp the cable to the wall.</p> <p>Ask:</p> <p>What are the accessories that support the cable?</p> <p>Possible Responses:</p> <ul style="list-style-type: none"> • Saddle • Angle bracket • Suspension hook <p>Tell:</p> <p>Next, let us how the cable is being connected to the meter.</p>
		<p>14. Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>As you can notice, there are 4 terminals in the meter. Here, we have seen the left two terminals are connected to the incoming service lines and the right two terminals are connected to the outgoing service lines to the consumer's MCB. Then, the meter terminals and meter cover have to be tightened.</p> <p>Let us next see how to fix the angle bracket.</p>
		<p>15. Tell:</p> <p>The lineman makes holes using a drill machine. He then installs the angle bracket using the fastener.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>
		<p>16. Tell:</p> <p>The angle bracket has two grouting holes. At the back, it has a fastener to fit to the wall. These three holes on the angle bracket are used to fit the suspension hook.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>Let us next see how it is installed.</p>
		<p>17. Tell:</p> <p>The equipment that supports and grips the cable is called 'Service Cable Anchor'. In a service cable anchor, the cable is inserted through the equipment. When the cable is inside, we need to press its blade and slide it. When you press it, the cable binds and grips the cable anchor. This helps it not to slip from its position.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>











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 	18.	<p>Tell:</p> <ul style="list-style-type: none"> • MS angle slot will be fixed with the help of a D-clamp • The service cable anchor will be fixed into these slots of MS angle to hang freely • The hung anchors support the service cable lines • The connection from the poles must be well dressed with insulation and extended without jumbling the cables on the pole <p>Facilitator's Note: Play the video.</p>
 	19.	<p>Tell: Here, you can see:</p> <ul style="list-style-type: none"> • The fixing of angle bracket on the wall • The suspension hook is fixed to the angle bracket <p>Facilitator's Note: Play the video.</p> <p>Tell: The next step is to fix the cable into the suspension clamp.</p>
 	20.	<p>Tell: To fix the cable into the suspension clamp, we need to:</p> <ul style="list-style-type: none"> • Insert cable in the suspension hook • Fix the service cable firmly and • Fix the saddle <p>Facilitator's Note: Play the video.</p>
 	21.	<p>Tell: Here, you can notice that the lineman climbs down with the help of clamps.</p> <p>Facilitator's Note: Play the video.</p> <p>Tell: The next step is to create jumpers.</p>
 	22.	<p>Tell: The earthing should be connected to the service line through this armouring cable. Little bit of the outer most PVC sheath of the service cable is peeled. The outer armour will be exposed and visible.</p> <p>Facilitator's Note: Play the video.</p> <p>Tell:</p>





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			To establish contact with the steel armoured wire, we will connect the 10 sq.mm PVC earthing cable through the jubilee clip.
		23.	<p>Tell:</p> <p>As you tighten the jubilee clip, the armour of cables will come in contact with the earth and PVC wire. The other end of the green wire is connected to the earthing of the network ABC.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>Continuity will be ensured from there till the green wire can be seen inside the meter box.</p>
		24.	<p>Tell:</p> <p>We connect PVC wire to this bolt using the thimble from inside the box. This bolt now becomes the earth bolt.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>Here, you can see the complete meter box installation.</p> <p>Let us now see the next step of climbing the ladder using safety equipment</p>
		25.	<p>Tell:</p> <p>The lineman climbs the ladder using the double lanyard of the full body harness. This will ensure that the lineman is safe at the top of the ladder.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>There is a D-clamp, which is fixed with two sets of nuts and bolts on the angle. The lineman will fit the same on the pole.</p>
		26.	<p>Tell:</p> <p>After the lineman climbs the ladder, he needs to:</p> <ul style="list-style-type: none"> • Fix the service cable anchor to the slotted angle • Use tester to check if there is any leakage of current • Support the cable with service cable anchor <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>The next step in single-phase energy meter installation is to provide connection to the consumer through distribution box.</p>








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 	27.	<p>Tell:</p> <p>The white coloured distribution box is connected to the LT ABC.</p> <p>First, we need to open the distribution box. Its lock can only be opened using Allen key.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>
 	28.	<p>Tell:</p> <p>To connect to the phase, you need to connect the red wires to the upper bus bar through the loop of the jumper. The neutral is connected by the bottom black wires. The distribution box has cable entry holes beneath the distribution box. Cut the jumper to the required size if the jumper is long. This is to avoid jumbling inside the distribution box.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>
 	29.	<p>Tell:</p> <p>The lineman peels the outer insulation of both the phase and neutral conductor wires. He first ensures that a connection is provided to the neutral. We can now see that the neutral is connected. Next, we will connect the phase.</p> <p>Facilitator's Note:</p> <p>Play the video.</p>
 	30.	<p>Tell:</p> <p>Let us debrief the steps involved in the installation of single-phase energy meter.</p> <p>The steps involved in the process of installing a single-phase energy meter at the consumer's premises are as follows:</p> <ul style="list-style-type: none"> • Visit customer's place and greet the customer • Gather material, the required tools and tackles • Follow safety measures • Install meter into the meter box • Manage accessories required to support the cable • Connect the meter • Fix the angle bracket • Install the angle bracket • Fix the cable into the suspension clamp • Create jumpers • Climb the ladder using safety equipment • Provide connection for consumer through distribution box
 	31.	<p>Tell:</p> <p>The end of the PVC wire is connected to the messenger wire of the network LT ABC</p>

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		<p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>To provide earthing, connect:</p> <ul style="list-style-type: none"> • Jubilee clips to the messenger wire of LT ABC and tighten with screws • Green PVC wire to the messenger wire through the jubilee clips
		<p>32. Tell:</p> <p>After earthing process, a lineman has to make a few checks.</p> <p>Ensure that there is supply to the consumer's MCB by checking the output terminals with a series test lamp.</p> <p>Ensure that there is continuity of earthing by connecting one terminal to the earthing bolt on the meter box and another terminal to the phase.</p> <p>If the bulb glows, you can be assured of the connection or supply of energy.</p> <p>Let us look at the video clip to understand this well.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>After proper checking, ensure to educate the customer on a few aspects.</p>
		<p>33. Tell:</p> <p>We have installed the meter and have given cable connection. There is one task left. It is closing the meter box. Before closing the meter box, a lineman has to follow a few steps.</p> <p>Ask:</p> <p>What should a lineman consider before closing the box?</p> <p>Tell:</p> <p>A few steps before closing the meter box are:</p> <ul style="list-style-type: none"> • Inform customer on power and energy reading parameters for billing purpose • Explain the different types of parameters by scrolling on the meter like: <ul style="list-style-type: none"> - Voltage (V) - Current in Amperes (A) - Kilowatt (kWh) • Ensure that the reading starts from zero (0) when the meter is connected. Inform this to the consumer <p>Let us now look at a video to understand this well.</p> <p>Facilitator's Note:</p> <p>Play the video.</p> <p>Tell:</p> <p>Let us now look at the process of sealing the meter.</p>

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		<p>34.</p>	<p>Tell:</p> <p>The lineman first:</p> <ul style="list-style-type: none"> • Seals the terminal cover of the meter • Clamps and seals the meter box <p>We have now successfully completed the single-phase meter installation at a consumer's premises. Before we leave the premises, we have to follow a few checks. Let us look at them in a video.</p>
		<p>35-37.</p>	<p>Ask:</p> <p>Can you tell a few checks done by a lineman?</p> <p>Possible responses:</p> <ul style="list-style-type: none"> • Clean the premises • Submit the documents <p>Facilitator's Note:</p> <ul style="list-style-type: none"> • Appreciate the responses <p>Tell:</p> <p>Well attempted! Let us look at the video.</p> <p>Facilitator's Note:</p> <ul style="list-style-type: none"> • Play the video <p>Tell:</p> <p>Ensure that you:</p> <ul style="list-style-type: none"> • Collect scrap from the premises • Inform customers about the safety measures to be taken • Hand over the company's handbook for reference of the customer • Take signature of the customer • Give one copy of the document to the customer and • Collect feedback from the customer
			<p>Tell:</p> <p>In this video presentation, we have seen Single-Phase Energy Meter Installation.</p>
<p>Key Learning Outcomes</p>			
		<p>38-39.</p>	<p>Tell:</p> <p>Let us quickly recollect the key points of this session.</p> <ul style="list-style-type: none"> • Steps involved in the process of installing a single-phase energy meter at the consumer's premises are as follows: <ul style="list-style-type: none"> ○ Visit customer's place and greet the customer ○ Gather material, the required tools and tackles ○ Follow safety measures ○ Install meter into the meter box

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		<ul style="list-style-type: none">○ Manage accessories required to support the cable○ Connect the meter○ Fix the angle bracket○ Install the angle bracket○ Fix the cable into the suspension clamp○ Create jumpers○ Climb the ladder using safety equipment○ Provide connection for consumer through distribution box● Allen key is used to open and close distribution box● Red wires and neutral wires are connected to the respective bus bars in the distribution box● Test lamp is connected to MCB and output terminals, earthing phases and phase-to-phase to check if the lines are energised● Ensure proper clamping and sealing of the meter box● Submit the required documents and collect the feedback on the service provided● We need to prepare the earth connections from the armoured cable● To provide earthing, first connect jubilee clips to the messenger wires coming from the LT ABC and tighten with screws● Always ensure that the reading starts from zero (0) when the meter is connected● You need to seal the terminal cover of the meter. Once you press the seal, the wire inside the seal cannot be removed● Avoid leaving any scrap material on the customer's premises● After installation, ensure to take the customer's signature on the form and also collect feedback from the customer
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