













Session: Low Tension Current Transformer (LTCT) Energy Meters













Learning Objective	Evaluation Criteria
Explain how Current Transformers (CTs) are connected to an energy meter to make it tamper proof in the box	Interactive Questioning

	Duration	60 Minutes
	Resources	PowerPoint Presentation, Whiteboard, Markers, Screen and Projector
	Facilitator's Notes	In this session, take the participants through an interactive presentation with video snippets on Low Tension Current Transformer or LTCT energy meters and explain how the current transformers are connected to an energy meter.









End of Notes

		1.	<p>Tell:</p> <p>Welcome to the video presentation on 'Low Tension Current Transformer (LTCT) Energy Meters.'</p> <p>In this video presentation, we will learn how Current Transformers (CTs) are connected to an energy meter to make it tamper proof in the box.</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 how Current Transformers (CTs) are connected to an energy meter to make it tamper proof in the box</p>
			<p>Tell:</p> <p>A communication port connection is used to view the meter reading remotely through a modem.</p> <p>Let us now look at the salient features, parameters and functioning of LTCT meters.</p>
		3.	<p>Tell:</p> <p>To record according to the connected load consumption directly, a heavy meter is required. Its terminals have to be bolted. Even the insulation parameters have to be increased to avoid short circuit during installation. This is practically impossible, as it is expensive and not feasible.</p> <p>Facilitator's Note:</p> <p>Click to play the video.</p> <p>Considering these requirements, CT has been used inside the meter. This is called</p>








Low Tension Current Transformer (LTCT) Energy Meters

			<p>LTCT or Low Tension Current Transformer meter.</p> <p>These meters are used to record power consumption of loads ranging from 26 kW to 99 kW.</p>
		4.	<p>Tell:</p> <p>Let us look at the four kinds of meters available. They are Genus, Secure, Landys Gyr and L&T.</p> <p>We use two segments for meters. The first segment is 200/5 Ampere LTCT meter for loads of 51 kilowatts to 99 kilowatts. The other is 100/5 Ampere CT meter for 26 kilowatts to 50 kilowatts.</p> <p>Facilitator's Note:</p> <p>Click to play the video.</p>
		5.	<p>Tell:</p> <p>Let us now learn about meter box. This is a 100/5 Ampere meter box for loads of 26 kilowatts to 50 kilowatts. The CT required is 100/5 ampere for recording.</p> <p>Facilitator's Note:</p> <ul style="list-style-type: none"> • Click to play the video. • Brief them about the meter box
		6.	<p>Tell:</p> <p>This is a Genus meter. It displays 100/5 ampere. It means that it is made for loads of 26 kilowatts to 50 kilowatts.</p> <p>Facilitator's Note:</p> <p>Click to play the video.</p> <p>Tell:</p> <p>Next, let us look at the Genus meter.</p>
		7.	<p>Tell:</p> <p>The Secure meter, which is of 200/5, is made for loads of 52 kilovolts to 99 kilovolts.</p> <p>We use two segments for meters. The first segment is 200/5 Ampere LTCT meter for loads of 51 kilowatts to 99 kilowatts. The other is 100/5 Ampere CT meter for 26 kilowatts to 50 kilowatts.</p> <p>Facilitator's Note:</p> <p>Click to play the video.</p>
		8.	<p>Tell:</p> <p>You can see that in this CT, there are 11 terminals. These terminals are required for an LTCT meter. They can be divided into 4 sets with 3 terminals in each set.</p> <p>Facilitator's Note:</p> <p>Continue to play the video.</p>
		9.	<p>Tell:</p> <p>These sets are joined to R, Y, B and neutral phases. So, R phase requires 3 terminals, Y phase requires 2 terminals, B phase requires 3 terminals. Finally, 2</p>

Low Tension Current Transformer (LTCT) Energy Meters

			<p>terminals are joined to neutral for incoming and outgoing.</p> <p>Facilitator's Note: Continue to play the video.</p>
		10.	<p>Tell:</p> <p>Let us look at R phase. The first and third terminals are called S1 and S2. These belong to the CT. The middle terminal is called P1. P stands for Potential. They give the recording of the meter. This is also called RBS. In this way, this forms a block of 11 terminals.</p> <p>Facilitator's Note: Continue to play the video.</p>
		11.	<p>Tell:</p> <p>As shown here, you have to lock these terminals and fix them properly.</p> <p>Earlier, ring type CTs were used in meters. In those CTs, a meter was placed in an open meter box. As technology is advancing, we are using meters that are more efficient.</p> <p>Facilitator's Note: Continue to play the video.</p>
		12.	<p>Tell:</p> <p>As far as tamper-proof parameters are concerned, the same logic is used in this meter also.</p> <p>These meters are not affected by AC or DC injection.</p> <p>If a meter is tampered by opening the cover, it displays the time and date of opening.</p> <p>It is not affected by ESG, electrostatic discharge or radio frequencies.</p> <p>The features of a Secure meter are similar to those of a polyphase meter.</p> <p>Facilitator's Note: Click to play the video.</p>
		13.	<p>Tell:</p> <p>One important thing to remember is CI of 0.5 S.</p> <p>A polyphase meter of 1 kilovolt belongs to class 1 meter. All LTCT meters belong to 0.5 S class. It means the accuracy of 100 parameters should have an error of 0.5 plus or minus. It should not be more than this reading.</p> <p>As you can see, this meter is displaying 160 impulses per kilowatt-hours. It displays three phases and three kinds of reading parameters. There will be active power kW, apparent power kVA and reactive power kVAh.</p> <p>As per energy reading, it displays kWh. kVAh and kVArh as active, apparent and reactive energy.</p> <p>When the meter is powered with 160 impulses of kWh, the reading increases from 1 to 2.</p> <p>Facilitator's Note: Click to play the video.</p>

Low Tension Current Transformer (LTCT) Energy Meters

 	14.	<p>Tell:</p> <p>Like polyphase meters, this meter has an optical slot. It has the same parameters.</p> <p>It displays three types of readings. It records the maximum demand in kW kilowatt power. It also displays instant line parameters like voltage reading. This means it displays which phase is working and which one is not working and the maximum and minimum loads of various phases.</p> <p>Facilitator's Note:</p> <p>Click to play the video.</p>
 	15.	<p>Tell:</p> <p>These meters can be used for loads up to 3 megawatts. This is done by increasing the rating of CTs from 400/5 A to 2000/5 A as ring CTs. This is commonly used in distribution transformers as consumer's energy meters and energy audit meters.</p> <p>Facilitator's Note:</p> <p>Continue to play the video.</p>
		<p>Tell:</p> <p>In this video presentation, we have seen the features and functions of Low Tension Current Transformer (LTCT) energy meters.</p>
<div style="background-color: red; color: white; padding: 5px; display: inline-block;">Key Learning Outcomes</div>		
 	16.	<p>Tell:</p> <p>Let us quickly recollect the key points of this session.</p> <ul style="list-style-type: none"> • LTCT or Low Tension Current Transformer meter is used to record power consumption of loads ranging from 26 kW to 99 kW • The four types of meters are Genus, Secure, Landys+ Gyr and L&T • There are 11 terminals in CT • The sets are joined to R, Y, B and neutral phases

