



# Bihar State Power Transmission Company Ltd., Patna

(DEPT. OF HR & ADMINISTRATION)

(Regd. Office:- Vidyut Bhawan, Bailey Road, Patna)

Contact No.: 7763817975, 7763818077, email-dgmhr1015.bsptcl@gmail.com, website-www.bsptcl.in

CIN-U74110 BR2012SGC018889

Office Order No. 346 Patna/

Date- 08/09/2025

T-I/Misc./CE-44001/19

In the light of Letter No. SGT/ED/03 Dated 26.06.2025 of Bureau of Indian Standards, Patna Branch Office, Patna, the following officers are being nominated to participate in 2 Day Capacity-Building Programme scheduled on 12-13 September, 2025.

| S.No. | Name                | Designation & Place of Posting | Mobile No. |
|-------|---------------------|--------------------------------|------------|
| I     | II                  | III                            | IV         |
| 1     | Asit Ranjan         | EEE (Project-I), HQ            | 7091097894 |
| 2     | Nayeem Ahmad        | EEE (Project-I), HQ            | 9262594694 |
| 3     | Sandeep Charya      | EEE (Project-II), HQ           | 9262594700 |
| 4     | Bibha Kumari        | EEE (Project-II), HQ           | 7091097885 |
| 5     | Amit Raj            | EEE (P&E), HQ                  | 9264427330 |
| 6     | Abhishek Kumar      | EEE (P&E), HQ                  | 7763817775 |
| 7     | Pramod Kumar        | EEE (Training & ERP), HQ       | 9262696746 |
| 8     | Madhu Priya         | EEE (O&M), HQ                  | 7763817768 |
| 9     | Sushank Saurobh     | EEE (O&M), HQ                  | 7763817784 |
| 10    | Deepak Kumar        | EEE (CRITL), HQ                | 7763817776 |
| 11    | Arindam Choudhary   | EEE (CRITL), HQ                | 7033098045 |
| 12    | Sarfraj Akhtar      | EEE (CRITL), HQ                | 7369021531 |
| 13    | Ahsan Reza          | EEE (CRITL), HQ                | 7763813879 |
| 14    | Deepak Kumar Thakur | EEE (CRITL), HQ                | 7033092545 |
| 15    | Chandan Kumar       | EEE (CRITL), HQ                | 7739943919 |
| 16    | Sweetie Kumari      | EEE (Communication), HQ        | 9262791371 |
| 17    | Gagan Kumar         | EEE (System Operation), HQ     | 7763817782 |
| 18    | Deepak Kumar Ram    | EEE (System Operation), HQ     | 7635092501 |
| 19    | Amitabh Kumar       | EEE (System Operation), HQ     | 7763817778 |
| 20    | Mukesh Kumar        | EEE (STU), HQ                  | 7763817847 |

By Orders,

Sd./-

(Dipak Kumar)

Dy. Secretary

Memo No.....

Dated .....

Copy forwarded to Sri Chandrakesh Singh, Scientist-E & Director, Bureau of Indian Standards, Patna Branch Office, Patliputra Industrial Estate, Patna-800013, Contact no.-0612-2271625, 2275342, Email-ptbo@bis.gov.in for kind information and necessary action.

2. Sri Chandrakesh Singh, Scientist-E & Director is requested to kindly inform the venue of training programme to all the participant at your end which will be decided by you.

Sd./-

(Dipak Kumar)

Dy. Secretary

Memo No. 2257

Dated 08/09/2025

Copy forwarded to Deputy Secretary, Engery Dept., Govt of Bihar/ PPS to CMD, BSPHCL/Sri Ashok Kumar, Training Coordinator-cum-Consultant, BSPHCL/PS to MD/Director (Operation)/ Director (Project)/ GM (HR/Admin)/CE (Training & ERP)/GM (F&A)/All DGM (HR/Admin)/Sr. Manager (F&A) and all above participants for information and needful action.

2. Enclosing the copy of L.No. SGT/ED/03 Dated 26.06.2025, all participants are requested to consult Sri Chandrakesh Singh, Scientist-E & Director, Bureau of Indian Standards, Patna Branch Office, Patna-800013 for further any information regarding said training programme.

Encl.-As above.

(Dipak Kumar)

Dy. Secretary

8.9.25

JS / MD BSPTCL



सत्यमेव जयते

भारत सरकार

GOVERNMENT OF INDIA

भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

उपभोक्ता मामले खाद्य एवं सार्वजनिक वितरण मंत्रालय

MINISTRY OF CONSUMER AFFAIRS FOOD & PUBLIC DISTRIBUTION

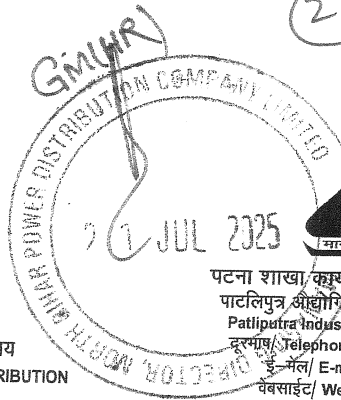
चन्द्रकेश सिंह CHANDRAKESH SINGH

वैज्ञानिक-ई निर्देशक एवं प्रमुख Scientist-E / Director & Head

दूरभाष / Telephone : 0612-2271625, 2275342

मोबाईल/ Mobile : 9868856361

ई-मेल/ E-mail : hptbo@bis.gov.in



पटना शाखा, कार्यालय/Patna Branch Office

पाटलिपुत्र औद्योगिक प्रांगण, पटना - 800013

दूरभाष/ Telephone : 0612-2271625, 2275342

ई-मेल/ E-mail : ptbo@bis.gov.in

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Our Ref :-SGT/ED/-03

To

Secretary

Energy Department

Government of Bihar

Subject: **Organizing Capacity-Building Programme for Officials of Energy Department**

Respected Sir,

The Bureau of Indian Standards (BIS), the National Standards Body of India, is engaged in the harmonious development of standardization, marking, and quality certification of goods. BIS plays a crucial role in the national economy by promoting the availability of safe and reliable quality products through standard formulation, certification, and testing. This helps reduce health risks to consumers, facilitates trade (both export and import), and ensures effective control over defective and substandard products.

It is important to highlight that sustainable development is not possible without the use of standard-compliant products. A deep understanding of Indian Standards and their role in ensuring the quality and safety of products is therefore essential for all stakeholders, especially in critical sectors such as Energy Department

In this context, BIS has designed two-day capacity-building programmes for state government officials, particularly for senior officials and engineers from the Energy Department

The objective of this programme is to:

- I. Deep understanding on Indian standards and their application related to Energy Department
- II. Familiarize government officials with various certification, standardization, and marking schemes operated by BIS
- III. Facilitate compliance with BIS standards in government tendering processes
- IV. Encourage the procurement of standard-compliant Products for department.
- V. This training programme is offered free of cost by BIS and can be conducted either at Patna or at any other suitable location in Bihar. Participants will be required to bear only their travel expenses. (A brochure detailing the training programme is enclosed for your reference.)

As the National Standards Body, BIS is committed to supporting the adoption of quality standards across sectors, especially in areas directly impacting public welfare and infrastructure. We therefore request you to kindly provide a suitable date for organizing this training programme for officials of your esteemed department. Alternatively, we would be grateful if you could grant us an appointment to meet and discuss the training Module in detail.

We look forward to your kind support and an opportunity to contribute to strengthening the implementation of standards in your department.

Thanking you,

Yours sincerely,

Chandrakesh Singh

Scientist - E & Director

Mob-9868856361

6783 ON (HRA/Adm.) NORTH  
Dated: 21.7.25

15/11/25  
23/7/25  
S.O.XV  
20.7.2025  
Sri Kedar  
21/7/25

2390 MD (North)  
Date: 21-07-2025

5 (278) 18-22 August

बिहार सरकार  
ऊर्जा विभाग

ज्ञापांक:-प्र01/ऊर्जा विविध-24/2024- 3455 पटना, दिनांक:- 18.07.2024

प्रतिलिपि:-अध्यक्ष-सह-प्रबंध निदेशक, बिहार स्टेट पावर (हो0) कं0 लि0, पटना/प्रबंध निदेशक, नॉर्थ बिहार पावर डिस्ट्रीब्यूशन कं0 लि0, पटना/प्रबंध निदेशक, साउथ बिहार पावर डिस्ट्रीब्यूशन कं0 लि0, पटना/प्रबंध निदेशक, बिहार स्टेट पावर ट्रांसमिशन कं0 लि0, पटना/प्रबंध निदेशक, बिहार स्टेट पावर जेनरेशन कं0 लि0, पटना/प्रबंध निदेशक, बिहार राज्य जल विद्युत निगम, पटना/निदेशक, ब्रेडा, विद्युत भवन-II, पटना एवं विद्युत निरीक्षक, विद्युत निरीक्षणालय, बिहार, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

  
सरकार के उप सचिव।

# SESSION TRANSACTION PLAN FOR TWO-DAY CAPACITY BUILDING PROGRAMME FOR DISTRIBUTION UTILITIES (DISCOMS)

| SESSION NUMBER | SESSION TITLE WITH DURATION                                                                                       | OBJECTIVE                                                                                                                                                                                                                                                                  | SESSION TRANSACTION PLAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | EXPECTED OUTCOME AND FOLLOW-UP RESOURCES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| SESSION 1      | <p><b>Session Title:</b><br/>"Distribution of power – Overhead Conductors"</p> <p><b>Duration:</b><br/>1 Hour</p> | <p><b>Objective:</b></p> <p>Comprehensive understanding of overhead transmission line conductors, emphasizing their types, construction, selection criteria, advancements in modern power systems, and key insights into relevant Indian standards and CEA guidelines.</p> | <p><b>Session Breakdown</b></p> <p><b>1. Introduction to Overhead Transmission Line Conductors (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> <ul style="list-style-type: none"> <li>○ To provide an overview of transmission line conductors.</li> </ul> </li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Types of Conductors used in power transmission.</li> <li>○ Key Indian standards <ul style="list-style-type: none"> <li>- IS 398 (Part 1)</li> <li>- IS 398 (Part 2)</li> <li>- IS 398 (Part 4)</li> </ul> </li> </ul> </li> <li>• <b>Methodology:</b> <ul style="list-style-type: none"> <li>○ Interactive presentation highlighting various types of conductors used in the power transmission and important Indian Standards.</li> </ul> </li> </ul> <p><b>2. Construction and Materials of Conductors (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> <ul style="list-style-type: none"> <li>○ To understand the materials and construction of transmission line conductors.</li> </ul> </li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Core materials: Galvanized steel.</li> <li>○ Outer layers: Hard-drawn aluminium and</li> </ul> </li> </ul> | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Understanding of key factors influencing conductor selection, including electrical, environmental, and design considerations.</li> <li>• Understanding of relevant Indian standards and Central Electricity Authority (CEA) guidelines for high-performance conductors.</li> </ul> <p><b>Follow-Up Resources:</b></p> <ul style="list-style-type: none"> <li>• Access to relevant standards on Overhead Transmission line conductors.</li> <li>• Contact information for further queries or guidance.</li> </ul> |

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|  |  |  | <p>aluminium alloys.</p> <ul style="list-style-type: none"><li>○ Physical constants and properties: Resistivity, density, and thermal expansion coefficients.</li><li>• <b>Methodology:</b><ul style="list-style-type: none"><li>○ Interactive presentation comparing the electrical and physical properties of various types of aluminium conductors.</li><li>○ Diagrams showing conductor construction.</li></ul></li></ul> <p><b>3. Factors for Conductor Selection and Basic Principles for Selection of Conductor (15 minutes)</b></p> <ul style="list-style-type: none"><li>• <b>Objective:</b><ul style="list-style-type: none"><li>○ To explore the factors influencing conductor selection for transmission lines and principles guiding conductor design.</li></ul></li><li>• <b>Content:</b><ul style="list-style-type: none"><li>○ Power quantum and current handling.</li><li>○ Line length and climatic conditions.</li><li>○ Terrain considerations</li><li>○ Electrical resistance and current ratings</li></ul></li><li>• <b>Methodology:</b><ul style="list-style-type: none"><li>○ Discussion on selecting conductors for different terrains.</li></ul></li></ul> <p><b>4. Advanced Conductors for Modern Power Systems and Regulatory Compliance (15 Minutes)</b></p> <ul style="list-style-type: none"><li>• <b>Objective:</b> Discuss the integration of advanced conductors in modern power systems and compliance requirements.</li><li>• <b>Content:</b><ul style="list-style-type: none"><li>○ High-Temperature Low-Sag (HTLS) conductors.</li><li>○ Challenges in deploying conductors:<ul style="list-style-type: none"><li>- Right-of-way constraints</li></ul></li></ul></li></ul> |
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| SESSION 2 | <p><b>Session Title:</b><br/>"Distribution of Power - Aerial Bunched Cables"</p> <p><b>Duration:</b><br/>1 Hour</p> | <p><b>Objective:</b><br/>To provide participants with insights into the role of BIS standards in ensuring the quality of Aerial Bunched Cables</p> | <ul style="list-style-type: none"> <li>- Weather-related vulnerabilities</li> <li>- Cost-benefit analysis</li> <li>o Central Electricity Authority (CEA) guidelines for high-performance conductors.</li> <li>• <b>Methodology:</b> <ul style="list-style-type: none"> <li>o Interactive discussion on the use of HTLS conductors in high-temperature environments.</li> <li>o Interactive discussion with reference to CEA guidelines.</li> </ul> </li> </ul> | <p><b>Session Breakdown</b></p> <p><b>1. Introduction (15 Minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Current Regulatory Framework</li> <li>• <b>Content:</b> Brief on CEA Regulations, 2023 and Cables Quality Control Order, 2020</li> <li>• <b>Methodology:</b> Presentation with an overview on CEA Regulations and Quality Control Order and its contents.</li> </ul> <p><b>2. Design and Standard of Aerial Bunched Cables (15 Minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Selection criteria for cables: conductor size, insulation material</li> <li>• <b>Content:</b> References to be made to IS 14255: 1995</li> <li>• <b>Methodology:</b> Presentation highlighting sections from IS 14255: 1995</li> </ul> <p><b>3. Overview on Quality of Aerial Bunched Cables (15 Minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Testing requirements of Aerial Bunched Cables</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>o Understanding test reports and critical parameters</li> <li>o References to be made to IS 14255: 1995</li> </ul> </li> </ul> | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Understanding the key provisions of current regulatory framework on Aerial Bunched Cables.</li> <li>• Understanding of BIS standard on Aerial Bunched Cables.</li> <li>• Ability to interpret test results and ensure compliance with standard</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>• Access to relevant sections of the CEA Regulations and Cables Quality Control Order, 2020</li> <li>• Access to relevant BIS documents and standards.</li> </ul> |
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| SESSION 3 | <p><b>Session Title:</b><br/>"Underground Cables for Distribution Systems - Different types of Cables"</p> <p><b>Duration:</b><br/>1 Hour 15 Minutes</p> | <p><b>Objective:</b><br/>To provide participants with insights into the role of BIS in formulating standards for Underground Cables</p> | <ul style="list-style-type: none"> <li>• <b>Methodology:</b> Slide presentation with examples of test reports</li> </ul> <p><b>4. Conclusion and Q&amp;A (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Recap key points and address participant questions</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Summary of the role of BIS standards</li> <li>○ Open floor for participant questions and clarifications.</li> </ul> </li> <li>• <b>Methodology:</b> Facilitator-led summary and interactive Q&amp;A session.</li> </ul> | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Understanding the key provisions of current regulatory framework on Underground Cables.</li> <li>• Understanding of BIS standard on Underground Cables.</li> <li>• Ability to interpret test results and ensure compliance with standard</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>• Access to relevant sections of the CEA Regulations and</li> </ul> |
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| SESSION 4 | <p><b>Session Title:</b><br/>“Underground Cables for Distribution Systems – Selection and Application”</p> <p><b>Duration:</b><br/>1 Hour 15 Minutes</p> | <p><b>Objective:</b><br/>To provide participants with insights into the role of BIS in formulating standards for Underground Cables</p> | <ul style="list-style-type: none"> <li>○ Parts of an underground cable viz. Conductor, Insulation, Inner sheath, Armoring, Outer sheath.</li> <li>○ Importance of proper design for performance and safety.</li> <li>• <b>Methodology:</b> Slide presentation with diagram analysis and explanation</li> </ul> <p><b>4. Testing of Underground Cables (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To understand the methods for testing of underground cables</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Understanding test reports and critical parameters</li> <li>○ References to be made to IS 7098 and 1554 cables</li> </ul> </li> <li>• <b>Methodology:</b> Slide presentation with examples of test reports</li> </ul> <p><b>5. Conclusion and Q&amp;A (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Recap key points and address participant questions</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Summary of the role of BIS standards</li> <li>○ Open floor for participant questions and clarifications.</li> </ul> </li> <li>• <b>Methodology:</b> Facilitator-led summary and interactive Q&amp;A session.</li> </ul> | <p>Cables Quality Control Order, 2020</p> <ul style="list-style-type: none"> <li>• Access to relevant BIS documents and standards.</li> </ul>                                |
|           |                                                                                                                                                          |                                                                                                                                         | <p><b>Session Breakdown</b></p> <p><b>1. Introduction (15 Minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Current Regulatory Framework</li> <li>• <b>Content:</b> Brief on CEA Regulations, 2023 and Cables Quality Control Order, 2020</li> <li>• <b>Methodology:</b> Presentation with an overview on CEA Regulations and Quality Control Order and its contents.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Understanding the key provisions of current regulatory framework on Underground Cables.</li> </ul> |

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|  |  |  | <p><b>2. Introduction to Underground Cables and Selection Criteria (15 Minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To introduce the key factors influencing the selection of underground cables for distribution systems</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Importance of proper cable selection.</li> <li>○ Factors affecting selection: <ul style="list-style-type: none"> <li>- Voltage rating</li> <li>- Current carrying capacity</li> <li>- Environmental conditions (temperature, soil type, moisture)</li> <li>- Cost and reliability considerations</li> </ul> </li> </ul> </li> <li>• <b>Methodology:</b> Slide presentation with tables showing typical selection parameters</li> </ul> <p><b>3. Types of Underground Cables and Their Applications (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To classify underground cables based on their design and understand their specific applications</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Types of cables based on: <ul style="list-style-type: none"> <li>- Voltage level (LV, MV, HV cables)</li> <li>- Number of cores (single-core, multi-core)</li> <li>- Insulation material (PVC, XLPE, EPR)</li> </ul> </li> </ul> </li> <li>• <b>Methodology:</b> Slide presentation with diagram analysis and explanation</li> </ul> <p><b>4. Technical and Economic Considerations in Cable Selection (15 minutes)</b></p> | <ul style="list-style-type: none"> <li>• Understanding of BIS standard on Underground Cables.</li> <li>• Ability to interpret test results and ensure compliance with standard</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>• Access to relevant sections of the CEA Regulations and Cables Quality Control Order, 2020</li> <li>• Access to relevant BIS documents and standards.</li> </ul> |
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| SESSION 5 | <b>Session Title:</b><br>"Selection and Dimensioning of Insulators for Overhead Power Transmission Lines"<br><br><b>Duration:</b><br>1 hour 15 Minutes | <b>Objective:</b><br>To provide participants with a comprehensive understanding of the selection, classification, dimensioning, performance, and | <ul style="list-style-type: none"> <li>• <b>Objective:</b> To explore the technical and economic factors influencing cable selection for distribution systems</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Technical considerations:               <ul style="list-style-type: none"> <li>- Load capacity and voltage drop</li> <li>- Short-circuit performance</li> <li>- Thermal performance and de-rating factors</li> </ul> </li> <li>○ Economic considerations:               <ul style="list-style-type: none"> <li>- Initial cost vs. lifecycle cost</li> <li>- Cost of installation and maintenance</li> </ul> </li> <li>• <b>Methodology:</b> Slide presentation with excerpts from relevant Indian Standard (IS 1255)</li> </ul> <p><b>5. Conclusion and Q&amp;A (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Recap key points and address participant questions</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Summary of the role of BIS standards</li> <li>○ Open floor for participant questions and clarifications.</li> </ul> </li> <li>• <b>Methodology:</b> Facilitator-led summary and interactive Q&amp;A session.</li> </ul> </li></ul> |                                                                                                                                                                                                                                                           |
|           |                                                                                                                                                        |                                                                                                                                                  | <b>Session Breakdown</b><br><b>1. Overview of Insulators in Power Transmission (10 minutes)</b> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To introduce the concept of insulators and their importance in electrical transmission systems.</li> <li>• <b>Content:</b> Definition, purpose of insulators, and materials used (glass, ceramic, polymer, etc.).</li> <li>• <b>Methodology:</b> Short presentation with examples of insulator types.</li> </ul> <b>2. Classification of Insulators for Overhead Lines (15 minutes)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Expected Outcomes:</b> <ul style="list-style-type: none"> <li>• Importance of Insulators in Power Transmission.</li> <li>• Key Factors in Insulator Selection and Dimensioning.</li> <li>• Familiarity with how pollution impacts insulator</li> </ul> |

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|  |  | latest technological developments in insulators used for overhead power transmission lines. | <ul style="list-style-type: none"> <li>• <b>Objective:</b> To provide an understanding of the various types of insulators based on electrical and mechanical parameters.</li> <li>• <b>Content:</b> Types of insulators (pin, strain, suspension, etc.), and classification based on arcing distance, creepage distance, and mechanical properties.</li> <li>• <b>Methodology:</b> Presentation explaining classification and interactive Q&amp;A.</li> </ul> <p><b>3. Key Factors in Insulator Selection and Dimensioning (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To explain the criteria for selecting insulators and the parameters for dimensioning.</li> <li>• <b>Content:</b> Factors such as creepage distance, shed inclination, core material, and environmental considerations.</li> <li>• <b>Methodology:</b> Technical discussion on key parameters</li> </ul> <p><b>4. Ensuring Reliability: Pollution Performance and Design Tests (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To explain how pollution impacts insulator performance and the importance of design tests.</li> <li>• <b>Content:</b> Impact of pollution on insulators, design tests (water diffusion, UV, salt fog, flammability), and standards (IS 16684:2018).</li> <li>• <b>Methodology:</b> Case studies on pollution failures and design test.</li> </ul> <p><b>5. Recent Innovations in Insulators for Power Transmission (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To introduce participants to the latest technological advancements in insulators.</li> <li>• <b>Content:</b> Composite pin insulators, insulated cross arms, RTV silicone rubber, and diagnostic methods for polymer insulators.</li> <li>• <b>Methodology:</b> Presentation with recent case studies.</li> </ul> | <p>performance and the importance of design tests.</p> <ul style="list-style-type: none"> <li>• Familiarity with potential risks of not adhering to standards in insulator selection and usage.</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>• Access to relevant BIS documents and standards.</li> </ul> <p>Contact information for further queries or guidance.</p> |
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| SESSION 6 | <p><b>Session Title</b><br/>"Distribution Transformers-Types, Selection and Tests"</p> <p><b>Duration:</b><br/>1 Hour 30 Minutes</p> | <p><b>Objective:</b><br/>To provide the participants with an integrated understanding of the Design and Quality parameters of Distribution transformers as outlined in IS 1180 (Part 1 &amp; 3) on distribution transformers.</p> | <p><b>6. Risks of Non-Compliance with Standards (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To highlight the potential risks of not adhering to standards in insulator selection and usage.</li> <li>• <b>Content:</b> Electrical and mechanical failures, environmental risks, and operational costs.</li> <li>• <b>Methodology:</b> Discussion on key risks, with real-world examples of insulator failures due to non-compliance.</li> </ul> <p><b>Session Breakdown</b></p> <p><b>1. Present Scenario of Distribution Transformers in India (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Introduce the session and highlight the importance of Distribution Transformers in the current scenario.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Present Scenario of Distribution Transformers and its importance in the current scenario.</li> <li>○ Statutory requirements to be complied for Distribution Transformers.</li> </ul> </li> <li>• <b>Methodology:</b> Presentation with an overview of the session objectives and content.</li> </ul> <p><b>2. Challenges encountered in the context of the current scenario (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To ascertain the challenges encountered in the context of the current scenario of Distribution Transformers in India and relate the same with the provisions of Indian Standards on Distribution Transformers.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Challenges encountered in the current scenarios.</li> <li>○ Introduction to IS 1180 (Part 1 &amp; Part 3) along with Key Features.</li> </ul> </li> </ul> | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Understanding of the key provisions of IS 1180 (Series) related to Design, Quality Assessment of Distribution Transformers and the provisions available in the Indian Standards to address the challenges being encountered.</li> <li>• Knowledge of Important Indian Standards referred in the IS 1180 (Series) with respect to Raw Materials, testing procedures for ensuring quality of Distribution Transformers.</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>• Presentation slides based on IS 1180 (Series)</li> <li>• Access to IS 1180 (Series) and related technical documents.</li> </ul> |
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|  |  |  | <ul style="list-style-type: none"> <li>• <b>Methodology:</b> Interaction with the Participants and relate the challenges with the provisions of Indian standards on Distribution Transformers.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|  |  |  | <p><b>3. Overview of the relevant provisions in IS 1180 (Series) (25 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Familiarize participants with key provisions of IS 1180 (Series) related to Ratings, Winding Connections, Insulation level and types, Energy Efficiency Levels, Temperature Rise Limits and Losses.</li> <li>• <b>Content:</b> Technical Parameters with respect to Ratings, Winding Connections, Insulation Levels and types, Energy Efficiency Levels, Temperature Rise Limits, Losses of Distribution Transformers and Materials used in Distribution Transformers.</li> <li>• <b>Methodology:</b> Interactive lecture on the provisions of IS 1180 (Series)</li> </ul> |  |
|  |  |  | <p><b>4. Quality Assessment (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Familiarize participants with the provisions of IS 1180 (Series) for quality assessment of Distribution Transformers and compliance.</li> <li>• <b>Content:</b> Requirements &amp; Tests specified in IS 1180 (Series) for quality assessment of Distribution Transformers.</li> <li>• <b>Methodology:</b> Interactive Lecture on the Provisions of IS 1180 (Series).</li> </ul>                                                                                                                                                                                                                                |  |
|  |  |  | <p><b>5. Impacts of Non-Compliance and Compliance with IS 1180 (Series) (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To make the participants aware of the potential impacts for non-compliance with IS 1180 (Series) and the benefits of compliance with the same.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                            |  |

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| SESSION 7 | <p><b>Session Title:</b><br/>“Distribution Transformers- Selection, Installation and Maintenance”</p> <p><b>Duration:</b><br/>1 Hour 30 Minutes</p> | <p><b>Objective:</b><br/>To provide the participants with a thorough understanding of the key aspects of transformer selection, installation, and maintenance as per</p> | <ul style="list-style-type: none"> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Risks &amp; Consequences</li> <li>○ Benefits of Compliance</li> </ul> </li> <li>• <b>Methodology:</b> Presentation of slides on the topic.</li> </ul> <p><b>6. Available Indian standards and New Standards under development (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To apprise the participants about the important Indian standards referred in IS 1180 (Series) and New Indian Standards under development.</li> <li>• <b>Content:</b> Important Standards referred in IS 1180 (Series) and New Indian Standards under Development</li> <li>• <b>Methodology:</b> Presentation of slides on the topic.</li> </ul> <p><b>7. Conclusion and Q &amp; A (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Recap key points and address participants' questions.</li> <li>• <b>Content:</b> Summary of the topics discussed during the session.</li> <li>• <b>Methodology:</b> Facilitator-led summary and interactive Q&amp;A session.</li> </ul> | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Understanding of the critical criteria for selecting, installing, and maintaining transformers.</li> <li>• Awareness of regulatory and statutory compliance as outlined in IS 10028 (Series)</li> </ul> |
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|  |  | <p>IS 10028 (Series) focusing on best practices, compliance, and addressing challenges.</p> <ul style="list-style-type: none"> <li>Consequences/Impacts due to improper Selection of Distribution transformers.</li> <li><b>Methodology:</b> Interaction with the Participants and presentation of slides on the topic.</li> </ul> <p><b>2. Challenges encountered during Selection of Distribution transformers (10 minutes)</b></p> <ul style="list-style-type: none"> <li><b>Objective:</b> Discussion on the challenges being encountered during selection of distribution transformers vis-à-vis the provisions available in the said IS for addressing the challenges highlighted during discussion.</li> <li><b>Content:</b> <ul style="list-style-type: none"> <li>Challenges encountered during Selection of Distribution Transformers.</li> <li>Introduction to IS 10028 (Part 1).</li> </ul> </li> <li><b>Methodology:</b> Interaction with the Participants and relate the challenges with the provisions of Indian standards on Distribution Transformers.</li> </ul> <p><b>3. Overview of the relevant provisions in IS 10028 (Part 1) (10 minutes)</b></p> <ul style="list-style-type: none"> <li><b>Objective:</b> Familiarize participants with key provisions of IS 10028 (Part 1) related to Selection of Distribution transformers.</li> <li><b>Content:</b> Overview of the Criteria for Selection of Distribution Transformers as specified in IS 10028 (Part 1)</li> <li><b>Methodology:</b> Interactive lecture on the provisions of IS 10028 (Part 1).</li> </ul> <p><b>4. Installation of Distribution Transformers (5 minutes)</b></p> | <ul style="list-style-type: none"> <li>Insights into best practices and common pitfalls in transformer management.</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>Presentation slides based on IS 10028 series.</li> <li>Access to IS 10028 (Series) and related technical documents.</li> </ul> |
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|  |  |  | <ul style="list-style-type: none"> <li>• <b>Objective:</b> To Highlight the importance of proper installation of Distribution Transformers.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Importance of proper installation of Distribution Transformers</li> <li>○ Consequences/Impacts due to improper Installation of Distribution transformers</li> </ul> </li> <li>• <b>Methodology:</b> Interaction with the Participants and presentation of slides on the topic.</li> </ul> <p><b>5. Challenges encountered during Installation of Distribution transformers (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Discussion on the challenges being encountered during installation of distribution transformers vis-à-vis the provisions available in the said IS for addressing the challenges highlighted during discussion.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Challenges encountered during installation of Distribution Transformers.</li> <li>○ Introduction to IS 10028 (Part 2)</li> </ul> </li> <li>• <b>Methodology:</b> Interaction with the Participants and relate the challenges with the provisions of Indian standards on Distribution Transformers.</li> </ul> <p><b>6. Overview of the relevant provisions in IS 10028 (Part 2) (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Familiarize participants with key provisions of IS 10028 (Part 2) related to installation of Distribution transformers.</li> <li>• <b>Content:</b> Overview of the provisions of installation of distribution transformers as specified in IS 10028 (Part 2).</li> </ul> |
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|  |  |  | <ul style="list-style-type: none"> <li>• <b>Methodology:</b> Interactive lecture on the provisions of IS 10028 (Part 2).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|  |  |  | <p><b>7. Maintenance of Distribution Transformers (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To Highlight the importance of maintenance of Distribution Transformers.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Importance of maintenance of Distribution Transformers</li> <li>○ Consequences/Impacts due to improper maintenance of Distribution transformers</li> </ul> </li> <li>• <b>Methodology:</b> Interaction with the Participants and presentation of slides on the topic.</li> </ul>                                                                                                                                                                                             |  |
|  |  |  | <p><b>8. Challenges encountered during Maintenance of Distribution transformers (5 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Discussion on the challenges being encountered during maintenance of distribution transformers vis-à-vis the provisions available in the said IS for addressing the challenges highlighted during discussion.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Challenges encountered during maintenance of Distribution Transformers.</li> <li>○ Introduction to 10028 (Part 3)</li> </ul> </li> <li>• <b>Methodology:</b> Interaction with the Participants and relate the challenges with the provisions of Indian standards on Distribution Transformers.</li> </ul> |  |
|  |  |  | <p><b>9. Overview of the relevant provisions in IS 10028 (Part 3) (15 minutes)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |

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| SESSION 8 | <b>Session Title:</b><br>"Mineral Insulating Oils, Supervision and Maintenance for a healthy electrical equipment"<br><br><b>Duration:</b><br>1 hour 30 Minutes | <b>Objective:</b><br>To provide participants with comprehensive knowledge of types, selection, and maintenance of Insulating Oils for an electrical equipment | <ul style="list-style-type: none"> <li>• <b>Objective:</b> Familiarize participants with key provisions of IS 10028 (Part 3) related to maintenance of Distribution transformers.</li> <li>• <b>Content:</b> Overview of the provisions of installation of distribution transformers as specified in IS 10028 (Part 3).</li> <li>• <b>Methodology:</b> Interactive lecture on the provisions of IS 10028 (Part 3).</li> </ul> <p><b>10, Conclusion and Q &amp; A (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Recap key points and address participants' questions.</li> <li>• <b>Content:</b> Summary of the topics discussed during the session.</li> <li>• <b>Methodology:</b> Facilitator-led summary and interactive Q&amp;A session.</li> </ul>                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|           |                                                                                                                                                                 |                                                                                                                                                               | <p><b>Session Breakdown</b></p> <p><b>1. Exploring Insulating Oils: Applications and Properties (15 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Changing trends in Energy transition</li> <li>• <b>Content:</b> Overview of insulating oils, significance in transformers, and emerging trends in the power sector.</li> <li>• <b>Methodology:</b> Lecture using slides with a focus on trends and challenges.</li> </ul> <p><b>2. Optimizing Insulating Oil: Key Selection Parameters (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To explain key properties and their impact on transformer performance to assist in selection of oil.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Oil properties like viscosity, dielectric strength, and thermal conductivity, and their significance.</li> </ul> </li> </ul> | <p><b>Expected Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Quality benchmarks for significant oil parameters</li> <li>• Knowledge of best practices for selection and maintenance of insulating oils.</li> <li>• Insights from Indian Standards for Turning Challenges into Solutions</li> <li>• Awareness of sustainable practices and innovations in the field</li> </ul> <p><b>Follow-up Resources:</b></p> |

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|  |  |  | <ul style="list-style-type: none"> <li>○ Key parameters for selecting insulating oils</li> <li>• <b>Methodology:</b> Lecture using real-world examples.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Access to relevant standards in the sector</li> <li>• Contact information for further queries or guidance.</li> </ul> |
|  |  |  | <p><b>3. Standards and Quality Benchmarks (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To introduce IS 335:2018 specifications for insulating oils and the differences between Type I and Type II.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Details on specifications, application scenarios, and significance of Type I vs. Type II oils.</li> <li>○ Significance of oil parameters and associated benchmarks</li> </ul> </li> <li>• <b>Methodology:</b> Link expectations w.r.t quality with solutions offered by Indian Standards</li> </ul>                                                                                       |                                                                                                                                                                |
|  |  |  | <p><b>4. Challenges and Emerging Trends w.r.t Maintenance of Insulating Oils (25 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Discuss Common Field failures and outline best practices for oil maintenance to ensure long-term equipment performance.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Supervision and maintenance as per IS 1866:2017, oil testing, and reconditioning methods.</li> <li>○ Explain oil tests and their significance in addressing common field issues</li> </ul> </li> <li>• <b>Methodology:</b> Brainstorming session and open floor for participants to share their views on overcoming challenges.</li> </ul> |                                                                                                                                                                |
|  |  |  | <p><b>5. Conclusion and Q&amp;A (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Discuss Common Field failures not covered and current field practices for oil maintenance.</li> <li>• <b>Content:</b> Key standards, and maintenance practices.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                |

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| SESSION 9 | <p><b>Session Title:</b><br/>"Repair of Distribution Transformers- Requirements and Good Practices"</p> <p><b>Duration:</b><br/>1 Hour 30 Minutes</p> | <p><b>Objective:</b><br/>To provide the participants with comprehensive knowledge of best practices for Repairing of Distribution Transformers as specified in IS 18284:2023.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>• <b>Methodology:</b> Open floor for participants to share their views.</li> </ul> | <p><b>Expected Outcome:</b></p> <ul style="list-style-type: none"> <li>• Gaining of comprehensive knowledge of IS 18284:2023 related to the best practices for repairing of distribution transformers and compliance requirements.</li> <li>• Gaining of Knowledge with respect to sustainable repair methods to enhance reliability and energy efficiency.</li> </ul> <p><b>Follow-up Resources:</b></p> <ul style="list-style-type: none"> <li>• Presentation slides on IS 18284:2023.</li> <li>• Access to BIS standards and additional technical resources.</li> </ul> |
|           |                                                                                                                                                       | <p><b>Session Breakdown</b></p> <p><b>1. Importance of Quality Repair of Distribution Transformers (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> To highlight the importance of Proper Repair of Distribution Transformers.</li> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>○ Failure Rates of various discoms in the country during 2020-2021 as per Operational &amp; Maintenance of Distribution Transformers Guidelines published by CEA in 2023.</li> <li>○ Importance of Proper Repair of Distribution Transformers.</li> <li>○ Major Causes of Failures of Distribution Transformers during Service.</li> <li>○ Consequences/Impacts due to improper Repair of Distribution transformers.</li> <li>○ Need for the standardisation of Repair of Distribution Transformers.</li> </ul> </li> <li>• <b>Methodology:</b> Interaction with the Participants and presentation of slides on the topic.</li> </ul> <p><b>2. Challenges encountered during Repair of Distribution Transformers (20 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Discussion on the challenges being encountered during Repairing of distribution transformers vis-à-vis the provisions available in the said IS for addressing the challenges highlighted during discussion.</li> </ul> |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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|  |  |  | <ul style="list-style-type: none"> <li>• <b>Content:</b> <ul style="list-style-type: none"> <li>◦ Challenges encountered during Repairing of Distribution Transformers.</li> <li>◦ Introduction to IS 18284:2023</li> </ul> </li> <li>• <b>Methodology:</b> Interaction with the Participants and relate the challenges with the provisions of Indian standards on Distribution Transformers.</li> </ul> <p><b>3. Overview of the relevant provisions in IS 18284: 2023 (40 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Familiarize participants with key provisions of IS 18284: 2023 related to the best practices for Repairing of Distribution Transformers.</li> <li>• <b>Content:</b> Overview of the provisions of Repair of distribution transformers-Code of Practice as specified in IS 18284:2023</li> <li>• <b>Methodology:</b> Interactive lecture on the provisions of IS 18284:2023.</li> </ul> <p><b>4. Conclusion and Q &amp; A (10 minutes)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Recap key points and address participants questions.</li> <li>• <b>Content:</b> Summary of the topics discussed during the session.</li> <li>• <b>Methodology:</b> Facilitator-led summary and interactive Q&amp;A session.</li> </ul> |
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18-22 August

147

10 set

20 set

10 set