



Centre for Industrial Solutions and Advanced Training

**SUBSTATION ENGINEERING, DESIGN,  
HV/MV TESTING OF SUBSTATION  
EQUIPMENT'S, COMMISSIONING,  
MAINTENANCE & CBM  
(765KV/400KV/220/132/66KV/33KV)**

11-14 July 2022, Nagpur, MH, India



# Centre For Industrial Solutions and Advanced Training

AN ISO 9001:2015 CERTIFIED

(Technical- Electrical/Mechanical/Automation/Chemical, Behavioral & Soft Skill, Safety, Business Excellence, Safety & Energy Audit)






"A complete Training Solution Under One roof"

## Four Days Non-residential Training Program (With Hands-ON) on **SUBSTATION ENGINEERING, DESIGN, HV/MV TESTING OF SUBSTATION EQUIPMENT'S, COMMISSIONING, MAINTENANCE & CBM (765KV/400KV/220/132/66KV/33KV)**

Applicable International standards (IEC, IEEE, IS) & specifications only for  
Electrical Engineers during **11-14 July 2022, Nagpur, MH, India**

**Who should attend:** Electrical practicing Engineer/ Manager / Substation Supervisor,  
Application Engineer, Design Engineer, Maintenance Engineer.

### HAND ON DURING TRAINING: VALUE ADDITION AND SPECIAL FEATURE:

Sub Station Visit	Transformer Testing	DC Earth Fault Locator	Relay Testing Facility
			
SF6 CB Demonstration	SF6 Testing Facility	Internal Wiring	SAS System
			

### Other Hands On Facility available:

1. 440KV/220KV; Substation; One and Half Breaker system, All advanced system.
2. SCADA implementation and control
3. Numerical Relay and details (Differential Protection, Distance Protection etc)
4. CT/PT/LA complete testing
5. SFRA Testing Kit and Facility, Tan Delta testing.
6. PLCC and other communication system with Optical Fiber controlled data.
7. Transformer Testing including SFRA- Availability depends on particular day
8. Circuit Breaker (SF6) Demonstration and Testing
9. Relay (Including numerical) Complete testing facility
10. DC Earth Fault Location, Advanced Meggar etc and many more.

Branch Office: 503, Sai Sankul, Swamy Colony, Aakar Nagar, Katol Road, Nagpur-440013, MS, India.

Web: [www.cisat.co.in](http://www.cisat.co.in); Email: [vikas@cisat.co.in](mailto:vikas@cisat.co.in); Contact: +91- 7709012815 (Branches: Thane/Pune/Nagpur/Kolkata)

(Your partner for Industrial solution & Empowerment of Human Capital)

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**Prerequisite:** Basic knowledge of Electrical Engineering and substation.

**Objective:** Why you should attend the program? Check below. If you feel the answer is no, you must do attend. It's our objective to make you knowledgeable.

- ❖ I can design substation by my own?
- ❖ I can do wiring and connections for every elements of substation.
- ❖ I can do set relay and make coordination by own.
- ❖ I knew the Engineering and engineering concepts behind substation and equipment's used.
- ❖ I can do selection & testing of all Electrical equipment's, can check polarities of all.
- ❖ I knew the steps taken on operation of BUS Bar and LBB protection.
- ❖ I am certain about reactive power compensation requirements.
- ❖ I knew the engineering significance for Vector group.
- ❖ I can do make parallel connections by own.
- ❖ I knew about tertiary windings.
- ❖ I can do carry out troubleshooting work of CB by own.

## **Delivery Methodology:**

- Introduction and Objective Setting
- Pre and Post Test,
- Knowledge Presentations,
- Hands On as per actual requirement
- Assignments & Exercise,
- Case Study,
- Discussion
- Feedback and Assessment

## **Registration Details:**

**Dates of the program:** 11-14 July 2022, Nagpur, MH, India (4 Days).

**Nonresidential Participation fees:** INR 34000/- per delegate + GST@18% (Including Tea, Lunch, Snacks and Course Material only).

**Payment:** ECS/NEFT/DD in favor of “**Centre for Industrial Solutions and Advanced Training**” Bank: IDBI, Sadar, Nagpur, Maharashtra 440018, India; Account No: **0509 1020 0000 3353**; IFSC Code: [IBKL0000648](#); MICR Code [440259006](#); Swift Code IBKLINBBNGP. GST Code: 27ABBPW5589J1ZV; SAC Code 999293; State Code 27; PAN No: ABBPW5589J.

**Venue:** Nagpur/KEC, *International Training Centre, Butibori, Nagpur, Maharashtra, India ( Butibori Industrial area, 18 KM from Nagpur Airport towards Hyderabad highway (Wardha Road))*

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## Course Contents & Delivery Schedule:

<p style="text-align: center;"><b>Day 1: Design of SS</b></p> <ul style="list-style-type: none"><li>• Introduction to substation &amp; Overview Design Criteria and Consideration for 765/400/220 KV substation</li><li>• Parameter Calculation</li><li>• Selection of substation Equipments- CT/PT/LA/CB/CP/Isolator</li><li>• Position, Layout and SLD Sectional Views, Clearances, BUS arrangement and Applicable standards AIS &amp; GIS Substation</li><li>• Earth Mat design</li><li>• Introduction to switchgear- Design &amp; Selection</li><li>• Test during commissioning, O&amp;M- Overview Discussion; Q&amp;A; Review of Days take away</li></ul>	<p style="text-align: center;"><b>Day 3: Hands ON</b></p> <ul style="list-style-type: none"><li>• Visit to Substation for demonstration</li><li>• Explanation in detail</li><li>• One and Half circuit breaker system</li><li>• Testing of Transformer, Ratio, Magnetic Balance, Vector and IR test.</li><li>• Breather demonstration</li><li>• CT/PT Testing; Knee Point Volt and other tests, IR Test</li><li>• Relay testing (Conventional and numerical) Connection details</li><li>• SCADA- Understanding, control PLCC Communication</li><li>• Tan Delta testing</li><li>• SFRA Testing and Short circuit test (Optional)</li></ul>
<p style="text-align: center;"><b>Day 2: Transformer</b></p> <ul style="list-style-type: none"><li>• Transformer: Testing and Commissioning</li><li>• Transformer, CB, CT &amp; PT, Name Plate reading &amp; connections</li><li>• Function of all parts of Power Transformer: Overview</li><li>• Measuring Devices; Vector groups &amp; Connections (Star &amp; Delta)</li><li>• % Impedance; Efficiency; Losses; Regulation; Acceptance &amp; Commissioning Test</li><li>• Overview of Basics of Protection (Line, transformer, LBB, Reactor)</li><li>• Discussion, Q&amp;A</li></ul>	<p style="text-align: center;"><b>Day 4:SS Equipments</b></p> <ul style="list-style-type: none"><li>• Testing: Site &amp; Pre commissioning Testing of SS equipment's</li><li>• Commissioning of Substation; Procedure and discussion; Wiring connections etc</li><li>• Reactor, LA, Insulation Coordination Control room requirement; Emergency Power-DG Sets</li><li>• Bay Control room concepts</li><li>• Control and Relay panels, Battery and Battery Charger</li><li>• SCADA for substation</li><li>• Communication (Data, OPGW) Multiplexer/PLCC</li><li>• CBM, NDT and RLA of Transformer Q&amp;A, Case studies</li></ul> <p style="text-align: center;"><b>Valedictory and Certificate Distribution</b></p>

**Experts and Trainers:** Trainer`s having Industrial work experience of more than 32+ Years and conducted many programs. They are internationally recognized.