



Centre for Industrial Solutions and Advanced Training

**TESTING OF ELECTRICAL  
EQUIPMENT'S: O&M, PROTECTION  
AND ADVANCED CONDITION  
BASED MONITORING**

6-8 Feb 2020 and 26-28 March 2020 at Nagpur





## 3 Days Training Program on

### **TESTING OF ELECTRICAL EQUIPMENT'S: O&M, PROTECTION AND ADVANCED CONDITION BASED MONITORING**

6-8 Feb 2020 and 26-28 March 2020 at Nagpur

#### **Course Objective:**

The participants will be well informed about various Electrical equipments in Industries, Faults, O&M techniques, also learn about various diagnostic Testing methods like: Offline & Online testing and condition based monitoring techniques, high level test like Motor Current and Torque Signature, Acoustic Emission, Surge Testing (IEEE522), Tan Delta & Capacitance Measurement, Partial Discharge Measurement, Dielectric Response Analysis and SFRA. The latest VLF (Very Low Frequency) HIPOT will be discussed in comparison to DC HIPOT and AC HIPOT Testing as per IEEE 433. We will discuss about switchgear and protection system.

#### **Who can attend:**

Electrical / Manager / Supervisor, Application Engineer, Condition Monitoring Engineer, Design Engineer, Maintenance Engineer /Manager/Supervisor/Reliability Engineer/Manager/ Supervisor

**Prerequisite:** Basic knowledge of Electrical Equipment's and experience in maintenance.

#### **Delivery Methodology:**

- Introduction and Objective Setting
- Pre and Post Test,
- Knowledge Presentations,
- Assignments & Exercise,
- Hands on as available.
- Feedback and Assessment

#### **Registration Details:**

**Dates of the program:** 6-8 Feb 2020 and 26-28 March 2020 at Nagpur

**Participation fees:** Nonresidential Participation Fees: INR 30000/delegate (plus GST@18%; Training program includes training material hard copies, Tea, Lunch & snack)

**Payment:** ECS/NEFT/DD in favor of "Centre for Industrial Solutions and Advanced Training" Payable at Nagpur, Maharashtra, India (For NEFT/ECS). Account No: 0509102000003353 Bank: IDBI, Wardha- 442001, MS, India; IFSC Code: IBKL0000509; Swift Code IBKLINBBNGP; MICR Code 442259001.

#### **Venue:**

We prefer on line Registration through our web [www.cisat.co.in](http://www.cisat.co.in) or call/email/sms

Vikas - 00-91-7709012815; 8669546332; [Rupali@cisat.co.in](mailto:Rupali@cisat.co.in); [vikas@cisat.co.in](mailto:vikas@cisat.co.in); [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com);

With Best Regards & Thanks,

Mrs. Rupali, Director - Business Development.

**Centre For Industrial Solution and Advanced Training**

**Web:** [www.cisat.co.in](http://www.cisat.co.in); **Email:** [rupali@cisat.co.in](mailto:rupali@cisat.co.in); [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com) ; Contact: +91- 7709012815



**Delivery Schedule: 3 Days Training Programme on Testing of Electrical Equipment's: O&M, Testing, Protection and Advanced Condition Based Monitoring**

Day	SR	Topic	Subtopic
<b>Day 1</b>	1	<b>Introduction, Objective Setting and Pre Test</b>	
	2	Review of Electrical Equipments and Applications	Industry Applications
	3	Listing of Electrical Parameters: Test for	R, L, C, O/C, S/C, V, I, P, Hz, etc.
	4	Various types of Tests: Manuafcturing, Factory	Test during commissioning, O&M
	5	<b>Power Cable:</b> Construction, Requirement	Acceptance & Commissioning Test
	6	Insulation resistance test, Polarization Index,	Partial discharge Measurement
	7	Very Low frequency testing (VLF Test), HIPOT Testing	Tan Delta Test
		<b>Power Transformer: Principle of Working and Operation &amp; Maintenance, Testing and</b>	
	8	Power/Distribution Transformer Construction & purpose	
	9	Function of all parts of Power Transformer	
	10	Measuring Devices; Vector groups & Connections (Star &	
	11	2/3 winding Transformer; Name Plate reading & connections	
		<b>Operations (Do`s and Don`ts)</b>	
	12	% Impedance; Efficiency; Losses; Regulation	
	13	Transformer Testing: Oil; Silica; Winding; Heating; Cooling etc.	
14	Transformer Installation, commissioning: Do`s and Don`ts		
15	Parallel operation & Load sharing, Tap Changer		
<b>Day 2</b>		<b>Maintenance (Fault Detection &amp; maint. Practices)</b>	
	16	Various Fault Detection & regular testing of Transformer	
	17	Maintenance, Data keeping,	
	18	IR, PI, Dielectric absorption, High Pot, Tan delta, DC winding	
	19	resistance, s/c , TTR, Magnetic Balance Tests.	
	20	Harmonics; Voltage Fluctuation control and Effects	
		<b>Faults &amp; Protection</b>	
	21	Scheduled and unscheduled Maintenance of Transformer.	
	22	Faults in Transformer; Faults while making Connections	
	23	<b>Protection of Transformer &amp; Relay Setting</b>	
	24	Protection of Transformer: Over Load, Over current, S/C,	
	25	Earthing failure, Differential Protection, REF, BR CB & relays.	
		<b>Failure Analysis</b>	
	26	Failure Analysis: FMEA and other	
	27	Thermography; Conditioning Monitoring & Life improvement	
28	<b>NDT; RLA; Many case studies.</b>		
29	Post Test, Assessment and Feedback		
30	Case Studies		
<b>Day 3</b>	31	<b>CT/PT/LA/CB/Control Panel/Isolator</b>	Fundamentals, Testing, Failure and
	32	Various other CBM Techniques (Informative)	Thermography; Oil Testing Case Studies & Discussion
	33	<b>Electrical Motor:</b>	Failure, O&M, Various Applicable Test Vibration Analysis; Current Signature Eddy Current & Magnetic Particle
		<b>Various Case Studies</b>	
	34		
	35	Summery of Days Learning; Q&A	
36	Post Test; Closure of Training; Feedback and Assessment		



# Centre For Industrials Solution and Advanced Training

AN ISO 9001:2008 CERTIFIED

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

“A complete Training Solution Under One roof”

## For Registration,

1. We prefer on line Registration through our web [www.cisat.co.in](http://www.cisat.co.in).
2. In other case do send confirmation via email to Vikas 00-91-7709012815; [vikas@cisat.co.in](mailto:vikas@cisat.co.in); [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com); or you can do call Vikas +91-7709012815 or 8669546332

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## TERMS & CONDITIONS FOR Workshop:

1. All training courses will require a minimum of 6 participants.
2. In the event of cancellation of a course, we will endeavor to inform all candidates a week before the course is due to take place. In such case all course fees paid will be reimbursed in full or the payment will be transferred in full to another course.
3. CISAT shall not accept liability for any consequential loss and shall have no liability to reimburse any other costs that may have been incurred, including transport costs, accommodation etc.
4. Special arrangements can be made for group bookings.
5. Certificate of participation will be issued when payment has been received in full.

## Contact for any In-house Training Program at your plant or location.

- HR Solutions and complete professional Training (HR/Soft Skill/Technical-Electrical/Mechanical/Automation /Process/Certification/Out Bound/Safety/Manufacturing excellence- TPM, TQM, 5S, Six Sigma etc)
- Course Content and presentations development – Customized to your company requirement.
- E-learning Development, Virtual Learning
- Online LMS or HR Automation system- Automated
- Employee Certification, skill or competency mapping and testing, Mentoring etc. From workers to Management level employees