



## 2 Day`s Training workshop on Power Plant Generator

### **"Construction, Operation, Maintenance, Protection & CBM"**

(Design, Rating, Operation & Maintenance, Protection and Safety)

(16-17 July and 20-21 August 2018 at Nagpur, Maharashtra, India)

#### Description:

This course has been developed to improve the effectiveness of generator operations and maintenance activities. Participation will provide the attendee about:

- Starting and operation of generators safely and effectively beside detailed construction of construction
- Abnormal operating conditions in generator and to determine the most appropriate response to such conditions.
- Effective generator preventive maintenance schedule.
- Understand the inspections why and how?

#### Objective:

Upon successful completion of this course the participant should be able to:

- Understand constructional design of Power plant generator and operation.
- Explain the function of instrument transformers (PTs and CTs)
- Understand protective relaying.
- o Concept of reactive power and effect.
- o Concept of synchronization and methods.
- Cooling systems.
- Describe abnormal generator operations including:
  - o Operation with unbalanced phase currents, Loss of field, Off-frequency operation
  - Define the items that must be considered when performing generator maintenance.
  - Do`s, Don`ts and other aspects of generator operation and maintenance

#### Who should Attend:

The course is useful for all plant personnel involved in operation and maintenance of generators.

Control room and auxiliary operators, maintenance technicians, plant management, supervisors, engineers, and work leaders, will benefit from this training program.



## Content of Program:

### I. Introduction

- A. Introduction with Expert
- B. Review Course Outline and Course Objectives

### II. Electrical Theory Review

- A. Electro Magnetism
- B. AC Generators: Construction and operation
- C. Power: Concepts, active and reactive
- D. Three Phase Power

### II. Generator detailed Construction: Various parts of generator

- A. Stator & Windings, Frame, Core, Stator Bars, Wedges, End Support
- B. End Shield
- C. Bearings
- D. Generator Rotor: Forging/Winding, Retaining Ring, Fans/Blowers, Collector Rings
- E. Generator Cooling

### III. Gen Support Systems

- A. Gas Control System
- B. Seal Oil System
- C. Stator Winding Cooling

### IV. Generator Voltage Regulators

- A. Automatic Voltage Regulators
- B. Regulator Protective Features

### V. Protective Relays

- A. Operator Response to Protective Relays
- B. Introduction
- C. Types of Relays
- D. Relay Descriptions

### VI. Synchronization and Operation of Generators

- A. Electrical Power Systems



- B. Reactive Power
- C. Generator Voltage Controls
- D. Synchronizing the Generator
- E. Generator Capability
- F. Operational Limits
- G. Abnormal Operations
  - 1. Unbalanced Phase Currents
  - 2. Excitation and Loss of Field
  - 3. off Frequency Operation
- H. Operation in Air

## VII. Work Planning & Scheduling

- A. Pre-outage Preparation
  - 1. Safety
  - 2. Parts Identification
  - 3. Tooling
  - 4. Lifting Devices
  - 5. Site Planning
  - 6. Technical Information
  - 7. Replacement Parts
  - 8. Schedules
- B. Outage Management
- C. Pre-Outage Inspections

## VIII. Generator Maintenance

- A. Disassembly
- B. Cleaning & Inspection
- C. Electrical Testing
- D. Reassembly

## IX. Course Conclusion

- A. Questions/Answers
- B. Review/Post test

### Delivery Methodology:



# Centre For Industrial Solution and Advanced Training

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- Introduction and Objective Setting
- Pre and Post test
- Knowledge Presentations- Understanding of every aspect of switchgear,
- Assignments & Exercise,
- Case Studies
- Feedback and Assessment
- Discussion and Interaction
- Delivery 9:30AM to 17:30 PM Hrs both days.
- Videos, Animations and demonstration will be shown to enhance the practical knowledge

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### Registration:

**Dates of the program:** 16-17 July and 20-21 August 2018 at Nagpur, Maharashtra, India.

**Participation fees:** Rs. 20000/- per delegate (Excluding GST@18%, Training program includes training material soft/hard copies, Tea, Lunch & snack, excluding lodging and Boarding)

**Payment:** ECS/NEFT/DD in favor of “Centre for Industrial Solution and Advanced Training” Payable at Nagpur, Maharashtra, India. Account No: 0509102000003353  
Bank: IDBI, Wardha- 442001, MS, India; IFSC Code: IBKL0000509; Swift Code IBKLINBB007; MICR Code 442259001.

**Venue:** KEC International Training Centre, Butibori, Nagpur.

**For Registration, please do contact to,**

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

1. Mahendra Dhande 09168326662,
2. 00-91-7709012815; [vikas@cisat.co.in](mailto:vikas@cisat.co.in); [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com);

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

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## Experts for the Workshop

### 1. Expert Mr B. B. BHANDARKAR

Professional Experience: Around 40 Years.

- Retd. Exe. Engr. / I/C, Supdt. Engr. Electrical.
- MAHAGENCO/MSPGCL EARSTWHILE M.S.ELECTRICITY BOARD.

Topics of Expertize: Generator, Transformer, Motor, Switchgear, Battery and Cables, Construction, Erection, Testing, commissioning, Operation and Maintenance.

Professional Experience:

- 36 Generation- Units of capacity, 10 ; 30 ; 62.5 ; 120 ; 140 ; 200 ; 210 ; 500 ; 660 MW.
- 3 Years in 210 Mw Unit Commissioning.
- 14 years in Electrical Maintenance,
- 3 years in operation on 210 /500 MW unit, as unit shit I/C.
- 6 years in Electrical Testing.
- 2 years in unit performance and efficiency optimization cell.

### 2. Mr. Pandhripande: Professional Experience: Around 40 Years

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### 3. Expert Vikas Wadnerkar: Expert Electrical Engineering

#### Education:

B.E.(Power Electronics), Nagpur University, 1997

M.E.(Power Electronics & Drives), SGSITS, Indore, 2001

PGHRM, Symbiosis Pune, India

Certified Professional Engineer –Electrical Engg (PE India)

Lead Auditor OHSAS 18001; IOSH (UK) Certified.

TUV Nord (ME) approved Trainer for Electrical Engineering

Professional Experience: Over 20+ Years (Production, Inst. & commissioning, Maintenance, Training)

Mr. Vikas Wadnerkar has done his graduation in Power Electronics Engineering (Electrical Engineering), Post-graduation in Electrical Engineering (Power Electronics and Electrical

Branch Office: A-306 Creative Home Apartment, Friends Colony, Anupam Society, Nagpur-440015, MS, India.

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Drives specialization) from premium institutions in India. All academic qualifications are passed with first division. He is a Lead auditor for OHSAS 18001 & IOSH (UK) certified.

Being a Technical expert in Electrical Engineering, during his professional career spanning of 20+ years, Mr. Vikas Wadnerkar has worked extensively in the areas of Training and Development with Steel/Power/Aluminium and Cement industries. He is also involved in various Consultancy activities to many organizations.

**He also delivered Training for employees of RAS Gas, Doha, Qatar through TUV Nord ME.**

He was associated with some reputed organizations like Engie-GDF Suez, Essar Steel Limited, Vedanta Aluminium Limited, Engie-GDF Suez, Torrent Power, Abhijeet Group, Corning India etc. He attended various Training programs and product specific Trainings to get expertise in his field of work.

Mr. Vikas Wadnerkar has worked as a faculty of expertise in Electrical Engineering area with specialization in Power Electronics, Electrical Drives, Transformer, Electrical Motors (HT/LT) and Protection. He already trained more than 2000 corporate employees for Courses in electrical Engineering such as Electrical Drives, Power Electronics, Switchgear protection and System, Substation & Substation Equipment' s O&M, Operation and maintenance of Transformer & Motor, Earthing and Relays. He already been delivered professional training in Electrical safety, Arc flash, International standards such as NFPA, OSHA etc. & some behavioral training related to Soft Skill and Attitude.

He has delivered Training programs to many companies few of them are Adani Power, Uttam Galva, Lloyds Steel Industries, Essar Steel, Ultratech Cement, Vedanta Aluminium, KSK Energy, Siemens, Cairn Energy, VNR Seeds, Sterlite, Adani Wilmar Limited, Aditya Birla group etc.

Beside this delivered trainings for employees of Lafarge Cement, Uttam Galva, LLOYDS Steel, Abhijeet Group, Vidarbha Power, L & T, Cairn Energy, Moser Baer, Adani Wilmar, Ashok Leyland, VNR Seeds, Sterlite, Indian Tool, Suzlon etc.

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