



## POWER AND ENERGY MANAGEMENT IN INDUSTRIAL UTILITIES & POWER FACTOR IMPROVEMENT TO IMPROVE ENERGY EFFICIENCY

### ENERGY AUDITING AND MANAGEMENT

(27-29 November 2017 at Nagpur)

#### Introduction:

Electrical utilities such as Pumps, Fans, Blowers, Compressors, Cooling towers, Chillers, Lighting systems etc are major consumer of electrical energy in any industry .

Government of India under "Urza daksh Bharat, Unnat bharat plan" has set a 11 point action plan to reduce energy intensity between 2016 and 2019 by 7% and triple the energy savings .

As per study report by **Bureau of energy efficiency**, GOI, by there is a huge potential of saving by 20-30% energy by implementing suitable measures. For example just by maintaining a optimum L/G ratio the energy consumption in cooling tower can be reduced by 15-20% .

The aim of subject training is to provide basic hands ON training to participants on various means and measures for energy saving in various electrical utilities .

3 days duration of the training comprising of audio visual training to participants on energy efficiency of various electrical utilities eg Compressors, Cooling towers, pumping systems etc . There shall also be a group activity to carry out energy audit, with the aim to find out energy leakages, of plant equipments followed by discussions . Detailed contents to be covered are mentioned below. Where as we are always open to cover any of the relevant topic raised by participant during training program for the benefit of individual and organization.

#### Objective:

To impart knowledge about basic concepts and practical approach for improving energy efficiency of electrical utilities viz Compressors, Cooling towers, Fans, Blowers, Refrigeration and air conditioning systems, Power distribution system etc.

#### Learning outcome

Trainees would be able to identify energy wastages occurring in electrical utilities and chalk out and implement action plans for reducing the same, thus optimizing the energy efficiency of the system.



## Benefit to organization:

- 3.2.1 Reduced operating cost due to improved energy efficiency.
- 3.2.2 Improved health of the equipment.

## Deliverables of the program

1. To impart basic knowledge about energy efficiency of various electrical utilities and methods to conduct efficiency study.
2. To provide **HANDS ON** training in conducting energy efficiency study for electrical utilities in plant .
3. To demonstrate through actual site measurements the saving potential and actual savings achieved by implementing suitable measures .

## Target Participants

Graduate engineer trainees , engineers , middle management level professionals with electrical and mechanical background .

## Training Contents/Delivery schedule:

1. Introduction and Objective Setting of 3 Days program. Expectation discussion.
2. Pre Test.
3. Energy Management and Audit Action planning- Calculation and Energy saving.
4. Energy efficiency of electrical power distribution systems, Fans, Motors & Transformer, Cables.
5. Energy efficiency of Cooling towers, Pumping systems, blowers & Compressors.
6. Energy efficiency of Air conditioning and refrigeration systems.
7. Plant illumination or lightening systems.



# Centre For Industrial Solution 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"

8. Power factor improvement techniques and applicable approach.
9. Approach towards conducting energy efficiency study of equipments.
10. Post Test.
11. Feedback, Assessment and Certificate distribution.

## Registration:

**Dates of the program:** 27-29 November 2017 at Nagpur.

**Participation fees:** Rs. 24000/- per delegate (Excluding GST@18%, Training program includes training material 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 000259000.

**Venue:** KEC International Training Centre, Butibori, Nagpur, MH (18KM from Airport)

*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. +91-7709012815 or 8669546332; [vikas@cisat.co.in](mailto:vikas@cisat.co.in); [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com);

\*\*\*\*\*

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

With Best Regards and Thanks,

Mrs Rupali, Director Business Development

**Centre For Industrial Solution and Advanced Training**

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

(GST Code:27ABBPW5589J1ZV; SAC Code 99-9293; State Code 27; PAN No: ABBPW5589J)

"A Complete Training Solution under One roof"

(Technical- Electrical/Mechanical/Automation/Chemical, Behavioral, Soft Skill, Safety, Out Bound training, Business Excellence, Safety Audit, Energy Audit, Automation Solution)

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

Web:[www.cisat.co.in](http://www.cisat.co.in); Email: [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com) ; Contact:+91- 7709012815 (Branches: Thane/Pune/Nagpur/Bhilai/Wardha)

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



# Centre For Industrial Solution 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”**

CISAT Training Calendar Nov-Dec 2017 (Nagpur/Pune/Kolkata)																																																																																																																																																																																																																																											
Sr	Date	Day	Name of the Program	Location	Sr	Date	Day	Name of the Program	Location																																																																																																																																																																																																																																		
<i>November</i>					<i>December</i>																																																																																																																																																																																																																																						
<i>Oct</i>	30	Mon	<i>Fundamentals of OPC (Open Platforms Connectivity / OLE for Process Control)</i>	<i>Pune</i>																																																																																																																																																																																																																																							
	31	Tues																																																																																																																																																																																																																																									
<i>Nov</i>	1	Wed			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sr</th> <th>Date</th> <th>Day</th> <th>Name of the Program</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td></td> <td>1</td> <td>Fr</td> <td colspan="2" style="text-align: center; background-color: #ff0000;"><i>Id-E-Milad</i></td> </tr> <tr> <td></td> <td>2</td> <td>Sa</td> <td colspan="2"></td> </tr> <tr> <td></td> <td>3</td> <td>Su</td> <td colspan="2" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> </tr> <tr> <td rowspan="3" style="background-color: #d9e1f2;">2</td> <td>6</td> <td>Mon</td> <td rowspan="2">Electrical Drives: VFD/VVVF/AC (Installation, Commissioning; Operation, Maintenance &amp; Parameter Setting)</td> <td rowspan="2"><i>Nagpur</i></td> <td>11</td> <td>4</td> <td>Mo</td> <td rowspan="3">Introduction to Piping Codes &amp; Standards</td> <td rowspan="3"><i>Kolkata</i></td> </tr> <tr> <td>7</td> <td>Tu</td> <td>5</td> <td>Tu</td> </tr> <tr> <td rowspan="2" style="background-color: #d9e1f2;">3</td> <td>8</td> <td>We</td> <td rowspan="2">Pipeline &amp; Terminal Valves, Control Valves &amp; Actuators: Operations &amp; Maintenance, Selection</td> <td rowspan="2"><i>Pune</i></td> <td>12</td> <td>6</td> <td>We</td> <td rowspan="2">HVAC Systems: Design, Operations &amp; Maintenance</td> <td rowspan="2"><i>Kolkata</i></td> </tr> <tr> <td>9</td> <td>Th</td> <td>7</td> <td>Th</td> </tr> <tr> <td rowspan="2" style="background-color: #d9e1f2;">4</td> <td>10</td> <td>Fr</td> <td rowspan="2">Power Transformer:s Best operating and maintenance Practices, Protection &amp; Life Improvements</td> <td rowspan="2"><i>Nagpur</i></td> <td></td> <td>8</td> <td>Fr</td> <td colspan="2"></td> </tr> <tr> <td>11</td> <td>Sa</td> <td></td> <td>9</td> <td>Sa</td> <td colspan="2"></td> </tr> <tr> <td colspan="5" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> <td colspan="5" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> </tr> <tr> <td rowspan="4" style="background-color: #d9e1f2;">5</td> <td>13</td> <td>Mo</td> <td rowspan="4">PLC-SCADA: Programming &amp; Engineering Applications (Fully Hands ON)</td> <td rowspan="4"><i>Pune</i></td> <td>13</td> <td>11</td> <td>Mo</td> <td rowspan="2">Industrial Hydraulics and Pneumatic; Operation, Maintenance, Troubleshooting &amp; Predictive Maintenance,</td> <td rowspan="2"><i>Kolkata</i></td> </tr> <tr> <td>14</td> <td>Tu</td> <td>12</td> <td>Tu</td> </tr> <tr> <td>15</td> <td>We</td> <td>14</td> <td>Th</td> <td>RCFA of Continuous Caster Machine</td> <td><i>Kolkata</i></td> </tr> <tr> <td>16</td> <td>Th</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="2" style="background-color: #d9e1f2;">6</td> <td>17</td> <td>Fr</td> <td rowspan="2">Failure modes and effects analysis (FMEA)</td> <td rowspan="2"><i>NGP</i></td> <td>15</td> <td>15</td> <td>Fr</td> <td rowspan="2">Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter</td> <td rowspan="2"><i>Kolkata</i></td> </tr> <tr> <td>18</td> <td>Sa</td> <td>16</td> <td>Sa</td> </tr> <tr> <td colspan="5" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> <td colspan="5" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> </tr> <tr> <td rowspan="2" style="background-color: #d9e1f2;">7</td> <td>20</td> <td>Mo</td> <td rowspan="2">Pumps, Air Compressors and Industrial Plant Machinery, Operation &amp; Maintenance</td> <td rowspan="2"><i>Nagpur</i></td> <td>16</td> <td>18</td> <td>Mo</td> <td rowspan="2">Bearings and Alignment of Rotating Machines</td> <td rowspan="2"><i>Nagpur</i></td> </tr> <tr> <td>21</td> <td>Tue</td> <td>19</td> <td>Tue</td> </tr> <tr> <td rowspan="3" style="background-color: #d9e1f2;">8</td> <td>21</td> <td>Tue</td> <td rowspan="3">Substation (765/400/220/132/66 KV) Engineering, Design, HV/MV Testing of Electrical Equipments, Commissioning and Protection</td> <td rowspan="3"><i>Nagpur</i></td> <td>17</td> <td>20</td> <td>We</td> <td rowspan="2">Materials &amp; Material Selection</td> <td rowspan="2"><i>Pune</i></td> </tr> <tr> <td>22</td> <td>We</td> <td>21</td> <td>Thu</td> </tr> <tr> <td rowspan="2" style="background-color: #d9e1f2;">9</td> <td>23</td> <td>Thu</td> <td rowspan="2">Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter</td> <td rowspan="2"><i>Nagpur</i></td> <td>18</td> <td>21</td> <td>Th</td> <td rowspan="3">World Best Engineering and Modern proactive Maintenance Practices for safe, reliable, compliant and competitive performance.</td> <td rowspan="3"><i>Nagpur</i></td> </tr> <tr> <td>24</td> <td>Fri</td> <td>22</td> <td>Fr</td> </tr> <tr> <td></td> <td>25</td> <td>Sat</td> <td></td> <td></td> <td></td> <td>23</td> <td>Sa</td> <td></td> </tr> <tr> <td colspan="5" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> <td colspan="5" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> </tr> <tr> <td rowspan="3" style="background-color: #d9e1f2;">10</td> <td>27</td> <td>Mo</td> <td rowspan="3">Power and Energy Management in Industrial Utilities &amp; Power Factor Improvement</td> <td rowspan="3"><i>Nagpur</i></td> <td></td> <td>24</td> <td>Su</td> <td colspan="2" style="text-align: center; background-color: #ff0000;"><i>Sunday</i></td> </tr> <tr> <td>28</td> <td>Tu</td> <td></td> <td>25</td> <td>Mo</td> <td colspan="2" style="text-align: center; background-color: #ff0000;"><i>Christmas</i></td> </tr> <tr> <td>29</td> <td>We</td> <td>19</td> <td>26</td> <td>Tu</td> <td rowspan="2">Advance Mechantronics &amp; Robotics</td> <td rowspan="2"><i>Pune</i></td> </tr> <tr> <td></td> <td>30</td> <td>Th</td> <td></td> <td>27</td> <td>We</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>28</td> <td>Th</td> <td colspan="2"></td> </tr> </tbody> </table>					Sr	Date	Day	Name of the Program	Location		1	Fr	<i>Id-E-Milad</i>			2	Sa				3	Su	<i>Sunday</i>		2	6	Mon	Electrical Drives: VFD/VVVF/AC (Installation, Commissioning; Operation, Maintenance & Parameter Setting)	<i>Nagpur</i>	11	4	Mo	Introduction to Piping Codes & Standards	<i>Kolkata</i>	7	Tu	5	Tu	3	8	We	Pipeline & Terminal Valves, Control Valves & Actuators: Operations & Maintenance, Selection	<i>Pune</i>	12	6	We	HVAC Systems: Design, Operations & Maintenance	<i>Kolkata</i>	9	Th	7	Th	4	10	Fr	Power Transformer:s Best operating and maintenance Practices, Protection & Life Improvements	<i>Nagpur</i>		8	Fr			11	Sa		9	Sa			<i>Sunday</i>					<i>Sunday</i>					5	13	Mo	PLC-SCADA: Programming & Engineering Applications (Fully Hands ON)	<i>Pune</i>	13	11	Mo	Industrial Hydraulics and Pneumatic; Operation, Maintenance, Troubleshooting & Predictive Maintenance,	<i>Kolkata</i>	14	Tu	12	Tu	15	We	14	Th	RCFA of Continuous Caster Machine	<i>Kolkata</i>	16	Th					6	17	Fr	Failure modes and effects analysis (FMEA)	<i>NGP</i>	15	15	Fr	Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter	<i>Kolkata</i>	18	Sa	16	Sa	<i>Sunday</i>					<i>Sunday</i>					7	20	Mo	Pumps, Air Compressors and Industrial Plant Machinery, Operation & Maintenance	<i>Nagpur</i>	16	18	Mo	Bearings and Alignment of Rotating Machines	<i>Nagpur</i>	21	Tue	19	Tue	8	21	Tue	Substation (765/400/220/132/66 KV) Engineering, Design, HV/MV Testing of Electrical Equipments, Commissioning and Protection	<i>Nagpur</i>	17	20	We	Materials & Material Selection	<i>Pune</i>	22	We	21	Thu	9	23	Thu	Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter	<i>Nagpur</i>	18	21	Th	World Best Engineering and Modern proactive Maintenance Practices for safe, reliable, compliant and competitive performance.	<i>Nagpur</i>	24	Fri	22	Fr		25	Sat				23	Sa		<i>Sunday</i>					<i>Sunday</i>					10	27	Mo	Power and Energy Management in Industrial Utilities & Power Factor Improvement	<i>Nagpur</i>		24	Su	<i>Sunday</i>		28	Tu		25	Mo	<i>Christmas</i>		29	We	19	26	Tu	Advance Mechantronics & Robotics	<i>Pune</i>		30	Th		27	We							28	Th		
	Sr	Date								Day	Name of the Program	Location																																																																																																																																																																																																																															
	1	Fr	<i>Id-E-Milad</i>																																																																																																																																																																																																																																								
	2	Sa																																																																																																																																																																																																																																									
	3	Su	<i>Sunday</i>																																																																																																																																																																																																																																								
2	6	Mon	Electrical Drives: VFD/VVVF/AC (Installation, Commissioning; Operation, Maintenance & Parameter Setting)	<i>Nagpur</i>	11	4	Mo	Introduction to Piping Codes & Standards	<i>Kolkata</i>																																																																																																																																																																																																																																		
	7	Tu			5	Tu																																																																																																																																																																																																																																					
	3	8	We	Pipeline & Terminal Valves, Control Valves & Actuators: Operations & Maintenance, Selection	<i>Pune</i>	12	6			We	HVAC Systems: Design, Operations & Maintenance	<i>Kolkata</i>																																																																																																																																																																																																																															
9		Th	7			Th																																																																																																																																																																																																																																					
4	10	Fr	Power Transformer:s Best operating and maintenance Practices, Protection & Life Improvements	<i>Nagpur</i>		8	Fr																																																																																																																																																																																																																																				
	11	Sa				9	Sa																																																																																																																																																																																																																																				
<i>Sunday</i>					<i>Sunday</i>																																																																																																																																																																																																																																						
5	13	Mo	PLC-SCADA: Programming & Engineering Applications (Fully Hands ON)	<i>Pune</i>	13	11	Mo	Industrial Hydraulics and Pneumatic; Operation, Maintenance, Troubleshooting & Predictive Maintenance,	<i>Kolkata</i>																																																																																																																																																																																																																																		
	14	Tu			12	Tu																																																																																																																																																																																																																																					
	15	We			14	Th	RCFA of Continuous Caster Machine	<i>Kolkata</i>																																																																																																																																																																																																																																			
	16	Th																																																																																																																																																																																																																																									
6	17	Fr	Failure modes and effects analysis (FMEA)	<i>NGP</i>	15	15	Fr	Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter	<i>Kolkata</i>																																																																																																																																																																																																																																		
	18	Sa			16	Sa																																																																																																																																																																																																																																					
<i>Sunday</i>					<i>Sunday</i>																																																																																																																																																																																																																																						
7	20	Mo	Pumps, Air Compressors and Industrial Plant Machinery, Operation & Maintenance	<i>Nagpur</i>	16	18	Mo	Bearings and Alignment of Rotating Machines	<i>Nagpur</i>																																																																																																																																																																																																																																		
	21	Tue			19	Tue																																																																																																																																																																																																																																					
8	21	Tue	Substation (765/400/220/132/66 KV) Engineering, Design, HV/MV Testing of Electrical Equipments, Commissioning and Protection	<i>Nagpur</i>	17	20	We	Materials & Material Selection	<i>Pune</i>																																																																																																																																																																																																																																		
	22	We			21	Thu																																																																																																																																																																																																																																					
	9	23			Thu	Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter	<i>Nagpur</i>	18	21	Th	World Best Engineering and Modern proactive Maintenance Practices for safe, reliable, compliant and competitive performance.	<i>Nagpur</i>																																																																																																																																																																																																																															
24		Fri	22	Fr																																																																																																																																																																																																																																							
	25	Sat				23	Sa																																																																																																																																																																																																																																				
<i>Sunday</i>					<i>Sunday</i>																																																																																																																																																																																																																																						
10	27	Mo	Power and Energy Management in Industrial Utilities & Power Factor Improvement	<i>Nagpur</i>		24	Su	<i>Sunday</i>																																																																																																																																																																																																																																			
	28	Tu				25	Mo	<i>Christmas</i>																																																																																																																																																																																																																																			
	29	We			19	26	Tu	Advance Mechantronics & Robotics	<i>Pune</i>																																																																																																																																																																																																																																		
	30	Th		27	We																																																																																																																																																																																																																																						
						28	Th																																																																																																																																																																																																																																				

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

Web:[www.cisat.co.in](http://www.cisat.co.in); Email: [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com); Contact:+91- 7709012815 (Branches: Thane/Pune/Nagpur/Bhilai/Wardha)

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



# Centre For Industrial Solution 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”**

Training Calendar Nov 2017 - Dec 2017						
Sr No	Month	Name of the Program	Date	Duration in Days	Fees in INR +GST	Location
ELECTRICAL ENGINEERING						
1	Nov	Variable frequency Drives & Soft Starters: Fundamentals, Operation, Maintenance & Parameter Setting with hands ON	6-7 Nov	2	18000	Nagpur
2	Nov	Electrical Arc Flash Hazard, Electrical Safety & Auditing, Earthing and Management Techniques, International Standards (IEEE, IE, NEC, OSHA, NESC, NFPA)	3-4 Nov	2	15000	Nagpur
3	Nov	How to increase life of Power or distribution Transformer: Best operating and maintenance Practices, Relay setting & Protection	10-11 Nov	2	16000	Nagpur
4	Nov	Substation (765/400/220/132/66 KV) Engineering, Design, HV/MV Testing of Electrical Equipments, Commissioning and Protection	21-23 Nov	3	27000	Nagpur
5	Nov	Power and Energy Management in Industrial Utilities & Power Factor Improvement	27-29 Nov	2	18000	Nagpur
Mechanical/Production Engineering						
1	Nov	Pipeline & Terminal Valves, Control Valves & Actuators: Operations & Maintenance, Selection	8-9 Nov	2	18000	Pune
2	Nov	Failure modes and effects analysis (FMEA)	17-18 Nov	2	18000	Nagpur
3	Dec	Hydraulics and Pneumatics; Operation, Maintenance, Troubleshooting & Predictive Maintenance	11-12 Dec	2	18000	Kolkata
4	Nov	Pumps, Air Compressors and Industrial Plant Machinery Operation, Maintenance and Condition monitoring	20-21 Nov	2	18000	Nagpur
5	Dec	Introduction to Piping Codes & Standards	4-6 Dec	3	24000	Kolkata
6	Dec	HVAC System: Design, Operation and Maintenance	7-8 Dec	2	18000	Kolkata
7	Dec	RCFA of Continuous Caster Machine	13-14 Dec	2	18000	Kolkata
8	Dec	Bearings and Alignment of Rotating Machines	18-19 Dec	2	18000	Nagpur
9	Dec	Materials & Material Selection	20-21 Dec	2	16000	Pune
Performance Improvement and Best Maintenance Practices						
1	Dec	World Best Engineering and Modern proactive Maintenance Practices for safe, reliable, compliant and competitive performance.	21-23 Dec	3	27000	Nagpur
2	Nov	Failure modes and effects analysis (FMEA)	17-18 Nov	2	18000	Nagpur
INSTRUMENTATION, AUTOMATION AND CONTROL						
1	Nov	PLC-SCADA: Programming & Engineering Applications (Fully Hands ON)	13-16 Nov	4	24000	Pune
2	Nov	Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter	24-25 Nov	2	16000	Nagpur
3	Dec	Pressure Safety Valve: Fundamentals, Design, Sizing and Parameter	15-16 Dec	2	16000	Kolkata
4	Dec	Advance Mechantronics & Robotics	26-28 Dec	3	24000	Pune