

CONTROLS TRAINING CENTER (West Allis, Wisconsin)

Toshiba opened the first Controls Training Center in North America in 2002. Using Toshiba's Fuchu Training facility in Japan as a model, an extensive classroom facility was developed, capable of accommodating eight students. It incorporates an interactive simulator able to provide hands-on practice for operation, maintenance and troubleshooting.

Students have at their disposal:

- EHC and AVR System Cabinets
- Interactive Simulator
- 4 Operator Stations
- Engineering Station
- Maintenance Tool
- Your facility's Schematics and Drawings

Our Controls Training Center offers basic and continuing education for your steam turbine operators and controls maintenance personnel from knowledgeable American instructors. Without routine distractions and interruptions, the classroom environment enhances the learning experience.

CTC Course Offerings

Standard four-and five-day courses are summarized below. We are also able to provide customized training to suit your needs.

Advanced Operator Training

The Advanced Operator Training program provides in-depth instruction on every phase of the Toshiba STG operation through hands-on practice exercises and simulations.

Advanced Controls Maintenance Training – Site Specific

Advanced Controls Maintenance Training is geared toward experienced I&C technicians and engineers responsible for maintaining and troubleshooting the D-EHC/AVR system.

Advanced Controls Maintenance Training – Group Session

For the benefit of new employees, or plants that otherwise cannot meet our two student minimum, we offer quarterly Advanced Controls Maintenance Training sessions open to all customers. While your facility's schematics and drawings will not be provided, classes will remain small enough for participants to have one-on-one time with the instructor.



TOSHIBA
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TOSHIBA AMERICA ENERGY SYSTEMS
Training Center
6623 West Washington Street
West Allis, WI 53214
Phone: 414.475.2800

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Training Services

OVERVIEW OF TOSHIBA TRAINING

Appropriate operator, controls and maintenance training is essential to proper plant operations.

To support our growing number of North American customers, Toshiba America Energy Systems (TAES) offers specialized state-of-the-art training courses:

- In our Controls Training Center (CTC) near Milwaukee, Wisconsin;
- At Toshiba's Keihin factory in Yokohama, Japan; and
- At your site.

To suit your needs, offerings include:

- Courses tailored specifically to your plant,
- Open sessions at CTC scheduled quarterly, and
- On-site courses with flexible scheduling to cover the maximum number of operator shifts possible.



ONSITE TRAINING

We realize that travel costs and tight schedules can make it difficult, if not impossible, to send employees to either facility. So we have added more site training options to our curriculum.

General Orientation Training

Recommended for less experienced employees. This training package provides general information for the Steam Turbine/Generator System and auxiliary equipment supplied by Toshiba.

On-Site Operator Training

This in-depth program sends an experienced American instructor to your plant for three days for classroom training and presentations. To accommodate your shifts, the course can be conducted at various hours to help the maximum number of employees have an opportunity to participate.

Advanced Controls Training

In addition to the Advanced Controls Maintenance Training course offered at our facility in West Allis, we can also provide Advanced Controls Training at your site. This classroom-style setting covers the same principles taught in our Controls Training Center without the simulated exercises.

Maintenance Training

Our Turbine Maintenance Training program focuses on providing site personnel with the skills to more safely and efficiently maintain your Toshiba equipment. These three-and five-day courses are intended to help provide optimum life expectancy of the Toshiba Steam Turbine/Generator and associated auxiliaries.

SCHEDULING

We are happy to discuss your particular needs and incorporate them into our curriculum. If you have any questions feel free to contact your Key Account Manager.

CURRICULUM (Training Programs)

COURSE NAME	General Orientation	On-Site Operator Training	Advanced Operator Training	Advanced Controls Maintenance Training	Advanced Controls Training	C900 Advanced Controls Maintenance Training	Maintenance Training
Location	Site	Site	MKE	Site	MKE	Site	Site
Days	5	3	4	5	5	4	5
Maximum Class Size	20	10	8	8	8	6	8
D-EHC System							
How to Use the Maintenance Tools				X	X	X	X
How to Change Set Values for System Controller				X	X		
How to Get Error Log for System Controller				X	X	X	X
How to Get Error Log for HMI				X	X	X	X
How to Understand Drawings				X	X	X	
How to Boot-up the D-EHC				X	X	X	
How to Detect Fail Origin for D-EHC				X	X	X	
How to Install and Set-up New OPS					X		
I/O Static Test Procedures					X		
Valve Calibrations					X		
Equipment Orientation							
Steam Turbine Construction	X	X	X				X
Steam Turbine and Auxiliaries	X	X	X				X
Fundamentals of Electrical Generation	X	X	X				
Brushless/Static Excitation System	X	X	X				X
Generator Cooling Systems/ Hydrogen	X	X	X				X
Stator Cooling Water Systems	X						X
Seal Oil Systems	X	X	X				X
AVR System							
Outline of D-AVR System		X	X	X	X	X	X
Outline of D-AVR Hardware Configuration (control cabinet)				X	X	X	X
Explanation of D-AVR Operation		X		X	X	X	X
Hands on D-AVR Operation				X	X		
Hands on Abnormal Operations/Exercise (Simulator)			X				
Explanation of D-AVR Alarm		X	X	X	X	X	
How to Operate When Failures Occur		X	X		X	X	
Each PCBs Function and Specification					X	X	
How to Boot the D-AVR					X	X	
How to detect Fail Origin					X	X	
Operations							
Normal Shutdown / Exercise		X	X				
Emergency Shutdown / Exercise		X	X		X		
Turbine and Generator Operations	X	X					
Operational Limitations	X	X					
Startup Operations	X	X					
Field Tour for System Walk Downs (as needed)	X						
Shutdown Operations	X						
Routine Test Procedures	X						
Troubleshooting	X				X		

JAPAN

Toshiba turbine and generator engineering courses (Yokohama, Japan)

Toshiba also offers state-of-the-art turbine engineering and generator engineering training at our Keihin Product Operations facility approximately 30 minutes from Tokyo. The lecturers are actual senior specialists from each area, and typical course contents for these 5-day courses include:

- Technical seminars by key specialists in turbine and generator technology
- Group Q&A sessions
- Tours of the turbine works and valve and heat exchanger equipment

Customers are also welcome to provide in advance any plant specific questions that they have for one-to-one discussions with the Toshiba Specialists during the Open Forum.

K-TEC TRAINING	Turbine Engineering Course	Generator Engineering Course
Turbine Works Tour	X	
Turbine Upgrade Technologies	X	
Condenser & Heat Exchanger Design & Maintenance	X	
Turbine Control Design & Maintenance	X	
Turbine Maintenance	X	
Steam Valves & Heat Exchanger Works Tour	X	
Materials for Steam Turbines	X	
Structural Design of Turbine Components	X	
Inspection Techniques for Turbine Plant	X	
Turbine Plant Life Assessment	X	
Turbine Rotor Vibration	X	
Balancing Exercise	X	
Open Discussion	X	X
Introduction to Generator Technology Update		X
Operation Capability and Monitoring		X
Generator Shop Tour		X
Generator Regular Maintenance		X
Generator Auxillary System Regular Maintenance		X
Generator Inspection Technology		X
Generator Preventative Maintenance		X
Generator Excitation Control System Design & Maintenance		X
Shop Tour		X
Generator Deterioration		X
Generator Upgrades		X
Generator Rotor Vibration		X