

## Module Overview

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This module provides the trainees with an overview of the power industry, from source to end user. It covers fossil-fuel power and nuclear generation plants, as well as the alternative power sources that represent an important part of the future for the power industry. The trainees will learn about the career opportunities in the industry and will be introduced to the safety issues that are specific to the industry.

## Prerequisites

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Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*.

## Objectives

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Upon completion of this module, the trainee will be able to do the following:

1. Define energy and name its sources.
2. Identify the different methods of converting energy into electricity.
3. Explain how electricity is transmitted and distributed.
4. Describe the economics of power generation and distribution.
5. Describe the environmental impacts of producing and distributing electricity and methods used to minimize negative effects.
6. Identify safety considerations associated with the power industry.
7. Identify career opportunities and training requirements in the power industry.
8. Identify concerns that might affect the future of the power industry.

## Performance Tasks

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This is a knowledge-based module; there are no performance tasks.

## Materials and Equipment

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Whiteboard/chalkboard

Markers/chalk

*Introduction to the Power Industry*

PowerPoint Presentation Slides  
(ISBN 978-0-13-214845-0)

Pencils and scratch paper

Multimedia projector

Desktop or laptop computer

Appropriate personal protective equipment

Example of a company safety procedure

Trade Terms Quiz\*

Module Examinations\*\*

\* Located in the Trainee Module

\*\*Use your access code to download this exam from the IRC.

## Safety Considerations

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Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require that the trainees visit job sites. Ensure that trainees are briefed on site safety policies prior to any site visits.

## Additional Resources

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This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

American Coal Ash Association website, [www.aaa-usa.org](http://www.aaa-usa.org).

*Guide to Electrical Power Distribution Systems*, Sixth Edition. Anthony J. Pansini. Lilburn, GA: The Fairmont Press, Inc.

*Power Generation Technologies*. Paul Breeze. Burlington, MA: Newnes.

*Steam—Its Generation and Use*. S.C. Stultz and J.B. Kitto. Barberton, OH: The Babcock and Wilcox Company.

*Wireless Power Transfer via Strongly Coupled Magnetic Resonances*. A. Kurs, K. Aristeidis, R. Moffatt, J.D. Joannopoulos, P. Fisher, and M. Soljacic. July 6, 2007. [www.sciencemag.org](http://www.sciencemag.org).

## Teaching Time for This Module

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An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 12½ hours are suggested to cover *Introduction to the Power Industry*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

Topic	Planned Time
<b>Session I. Introduction; Fossil-Fuel Power Plants; Nuclear Power; Renewable Energy</b>	
A. Introduction	_____
1. Electric Power Generation	_____
2. Power Transmission and Distribution	_____
3. Energy	_____
B. Fossil-Fuel Power Plants	_____
1. Steam Turbine	_____
2. Combustion Turbines	_____
C. Nuclear Power	_____
1. Nuclear Power Plants	_____
D. Renewable Energy	_____
1. Biomass	_____
2. Water (Hydropower)	_____
3. Geothermal Energy	_____
4. Wind Energy	_____
5. Solar Energy	_____
<b>Session II. Environmental Controls; Electrical Transmission and Distribution; Careers in the Power Industry</b>	
A. Environmental Controls	_____
1. Electrostatic Precipitators	_____
2. Scrubbers	_____
3. Bag House	_____
4. Selective Catalytic Reduction	_____
5. Water Waste	_____
6. Combustion Waste Products	_____



