

ATMW-2400: STEAM TURBINES

Cuyahoga Community College

Viewing: ATMW-2400 : Steam Turbines

Board of Trustees:

2012-06-28

Academic Term:

Fall 2025

Subject Code

ATMW - Appld Ind Tech - Millwrighting

Course Number:

2400

Title:

Steam Turbines

Catalog Description:

Covers the various types of steam turbines currently in use. Students will learn how a turbine operates and will identify the various components of a turbine. Students will disassemble a steam turbine and determine the millwrights' responsibilities while working on a steam turbine.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: Admissions to Millwrighting Technology apprenticeship program.

Outcomes

Course Outcome(s):

1. Apply knowledge of steam turbine operation, components, and determine the millwrights responsibilities while working on a steam turbine.

Objective(s):

1. Identify all safety requirements pertaining to turbine work.
2. Explain turbine operation and identify major components.
3. Demonstrate the proper methods of removing and installing bolts, regarding tensioning.

Course Outcome(s):

2. Perform safe rigging procedures for the disassembly and reassembly of the turbine including crane safety.

Objective(s):

1. Discuss gantry crane safety and operation.
2. Demonstrate proper sling and hardware selection.

Course Outcome(s):

3. Perform and document results of turbine inspection according to industry standards.

Objective(s):

1. Record accurate readings with precision tools to a tolerance of .001 of an inch.
2. Discuss industry standards for completion of turbine inspection sheets.

Methods of Evaluation:

Quizzes, tests class participation and field exercises.

Course Content Outline:

1. Introduction to steam turbines
 - a. Steam Turbine Locations
 - i. Coal burning plants
 - ii. Nuclear plants
 - iii. Co-generation facilities
 - b. Main components
 - i. Shell
 - ii. Rotor
 - iii. Diaphragms
 - iv. Valves
 - v. Bearings
 - vi. Seals
 - vii. Bolting
 - c. Safety requirements
2. Bolting
 - a. Identification
 - i. Size
 - ii. Thread pitch
 - iii. Strength
 - b. Methods of loosening and tensioning
 - i. Impact wrenches
 - ii. Thermal expansion
 - iii. Hydraulic wrenches
 - iv. Torque wrenches
3. Rigging
 - a. Gantry crane safety and operation
 - b. Proper sling and hardware selection
 - i. Wire rope, synthetic, chain slings
 - ii. Shackles and eye bolts
 - iii. Rigging beams
 - iv. Chain falls and come-alongs
4. Inspections
 - a. Rotor position
 - i. Dial indicator check
 - b. Diaphragm clearances
 - i. Feeler gauges and micrometers
 - c. Bearings
 - i. Blue checks
 - ii. Dimensional readings / micrometers
 - d. Oil deflectors
 - i. Dimensional readings / micrometers
 - e. Valves
 - i. Steam chest disassembly
 - f. Seals and packing clearances
 - i. Feeler gauges

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Resources

Carpenters International Training Fund. *UBC Steam Turbine Qualification Program.*, current. Carpenters International Training Fund, Las Vegas Nevada, 2011.

L. S. Starrett Company. *Tools Rules for Precision Measuring*; current. Abe Parkers books, Sarasota, Fla, 1998.

James Gerhart. *Mastering Math for the Building Trades.*, current. McGraw Hill New York, New York, 2000.

W.J. Kearton,. *Steam turbine theory and practice, a text-book for engineering students.*, Historical. Pittman and Sons, London, New York, 1922.

Resources Other

www.energy.siemens.com/hq/en/power-generation/ (<http://www.energy.siemens.com/hq/en/power-generation/steam-turbines/>)

library.thinkquest.org/C006011/english/sites/dampfturbine.php3?v...

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