

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: ENGY 330 Department: Energy Systems Technology

Course Title: Power Plant Operation I Semester: Spring Year: 1999

Objectives/Competencies

Course Objective	Competencies
1. Define boiler classifications.	a. Describe high pressure boilers. b. Describe low pressure boilers. c. Describe fire tube boilers. d. Describe water tube boilers.
2. Discuss boiler safety.	1. Describe water temperature and pressure relationships. 2. Describe boiling point. 3. Describe possible causes of boiler explosions.
3. Identify boiler construction methods.	1. Describe packaged boilers. 2. Describe set boilers. 3. Discuss internally fired vs. externally fired boilers.
4. Define methods of drum and shell construction.	1. Identify drum types and functions. 2. Describe shell design and support. 3. Describe methods of steam water separation.
5. Compare fire tube and water tube boilers.	1. Discuss water capacities and safety.

Course Objective	Competencies
6. Define boiler heat recovery systems.	<ol style="list-style-type: none"> 2. Discuss pressure limitations. 3. Discuss capacity limitations.
7. Define safety valve operation.	<ol style="list-style-type: none"> 1. Describe air heaters. 2. Describe economizers. 3. Describe blow down systems. 4. Describe condensate return systems.
8. Define water column function.	<ol style="list-style-type: none"> 1. Identify safety valve codes. 2. Describe safety valve functions and locations. 3. Discuss safety valve construction and testing.
9. Define primary water level indication techniques.	<ol style="list-style-type: none"> 1. Describe gauge gkss operation. 2. Describe try cock operation. 3. Describe alarming functions. 4. Describe water column maintenance procedures.
10. Describe pressure gauge function.	<ol style="list-style-type: none"> 1. Recite steps to replace gauge glass. 2. Troubleshoot gauge glass problems. 3. Identify true water level by secondary means.
11. Define boiler vent.	<ol style="list-style-type: none"> 1. Identify proper pressure gauge installation. 2. Identify pressure correction factors. 3. Define M.A.W.P.
11. Define boiler vent.	<ol style="list-style-type: none"> 1. Describe codes for boiler vent. 2. Describe start up vent operation.

Course Objective	Competencies
12. Define super heater.	3. Describe shut down vent operation. 1. Name super heater types 2. Identify operating procedures for super heaters. 3. Recite safety precautions with super heaters.
13. Identify soot blower functions.	1. Describe soot blower types. 2. Describe construction of soot blowers. 3. Describe operating procedures.
14. Define blow down.	1. Describe bottom blow down. 2. Describe surface blow down. 3. Describe continuous blow down.
15. Define boiler room systems.	1. Describe the steam system. 2. Describe the feed water system. 3. Describe the fuel system. 4. Describe the draft system.
16. Define feed water regulation.	1. Describe float type regulators. 2. Describe thermoexpansion type regulators. 3. Describe thermohydraulic type regulators.
17. Define steam trap.	1. Describe steam trap use and types. 2. Describe steam trap classifications. 3. Describe steam trap characteristics. 4. Describe steam strainer function and location.

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18. Define steam pressure regulation.	<ol style="list-style-type: none"> 1. Describe PRV function and location. 2. Describe PRV operating sequence. 3. Illustrate PRV layout in steam system.
19. Describe automatic non-return valves.	<ol style="list-style-type: none"> 1. Describe ANR valve location and operation. 2. Describe triple acting ANR valve operation. 3. Describe locking and tagging valves.
20. Define boiler operation.	<ol style="list-style-type: none"> 1. Describe general duties and responsibilities. 2. Describe cold plant start up. 3. Describe live plant start up.
21. Define boiler inspection.	<ol style="list-style-type: none"> 1. Describe boiler inspection preparation procedures. 2. Describe boiler inspection preparation safety. 3. Identify laws associated with boiler inspections.
22. Define fire prevention.	<ol style="list-style-type: none"> 1. Identify five requirements. 2. Describe five classifications. 3. Describe five safety procedures.
23. Describe centrifugal feed water pump operation.	<ol style="list-style-type: none"> 1. Identify safety measures involved in pump operation. 2. Calculate pump output based on application. 3. Describe construction of pump. 4. Describe maintenance procedures for centrifugal feed water pumps.