# 1.0 Description

The Boiler Operations course prepares the students to apply a cause-and-effect analysis to boiler operations for troubleshooting purposes. The course utilizes a generic operator training simulator (OTS) to provide learners the opportunity to improve their boiler operations and troubleshooting skills.

Our experienced instructors use a blended learning approach to ensure learners have the pre-requisite knowledge and skills to successfully complete the exercises. The course is approximately 70% hands-on, using the simulator to start-up and shutdown the unit. Troubleshooting scenarios require the learner to identify the potential cause, determine the appropriate corrective action(s) and return the unit to normal operating parameters or safely perform a shutdown.

Pre-and Post-course assessments allow each learner to see their learning progress from attending the course. Client training managers receive a detailed report of learner progress.

# 2.0 Training Outcomes

### Desired Knowledge

Upon completion of the Boiler Operations course, the learner will understand the operating cause-and-effect relationships of boiler operations. The learner will experience and become familiar with the effects of:

- Decreasing feed flow
- Increasing/decreasing steam header pressures
- Increasing/decreasing fuel gas flow
- Changes in BTU factors

### Desired Skills

The learner will enhance their boiler operating ability by improving the following skills:

- Selective attention
- Problem sensitivity
- Time-sharing
- Deductive reasoning
- Resistance to premature judgement
- Visualization
- Speed of closure
- Response orientation

# 3.0 Lesson Objectives

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|---|---|
| Given: | A dynamic steam boiler process simulator and technical documentation |
| You will: | Apply troubleshooting techniques to resolve steam boiler upsets |
| How Well: | Complete the exercises and knowledge assessment with 85% accuracy<br>Following written procedures and safety policies<br>Successfully completing exercises and scenarios |

**Enabling Objectives**

1. Explain the principles of operation of a boiler
2. Identify and describe the purpose of boiler components
3. Relate boiler process variables to operational safety
4. Define boiler operating terms
5. Explain the purpose and function of boiler control system process variables
6. Locate boiler control system process variables and list their normal operating values
7. Identify boiler startup sequence and demonstrate boiler startup operations
8. Demonstrate safe and effective boiler operations
9. Troubleshoot and resolve selected boiler upsets

# 4.0 Outline

I. Introduction
   a. Pre-Assessment

II. Review
   a. Boiler Operating Components
   b. Review Operating Terms
   c. Review Process Variables and Operational Safety

III. Simulator Orientation
   a. Starting an exercise
   b. Controlling from the schematic displays
   c. Using trend displays
   d. Responding to alarms

IV. Boiler Process and Controls
   a. Process inlet flows
   b. Process outlet flows
   c. Design operating values
   d. Process Variables

V. Exercises
   a. Startup
   b. Shutdown
   c. Abnormal Situations

VI. Post Assessment