

1.0 Description

The Natural Draft Fired Heater Operations course prepares the students to apply a cause-and-effect analysis to fired heater operations for troubleshooting purposes. The course utilizes a generic operator training simulator (OTS) to provide learners the opportunity to improve their heater 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 60% 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 Natural Draft Fired Heater Operations course, the learner will understand the operating cause-and-effect relationships of heater operations. The learner will experience and become familiar with the effects of:

- Increases and decreases in feed flow
- Increases and decreases in pressure/temperature
- Increases and decreases in stack oxygen
- Fuel composition change

Desired Skills

The learners will enhance their distillation 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

Given: A dynamic natural draft fired heater process simulator and technical documentation

You will: Apply troubleshooting techniques to resolve fired heater process upsets

How Well: Complete the exercises and knowledge assessment with 85% accuracy
Following written procedures and safety policies
Successfully completing exercises and scenarios

Enabling Objectives

1. Explain the principles of operation of a natural draft fired heater
2. Identify and describe the purpose of natural draft fired heater components
3. Relate natural draft fired heater process variables to operational safety
4. Define natural draft fired heater operating terms
5. Explain the purpose and function of natural draft fired heater control system process variables
6. Demonstrate safe and effective natural draft fired heater operations
7. Apply troubleshooting skills to resolve natural draft fired heater process upsets

4.0 Outline

- I. Introduction
 - a. Pre-Assessment
- II. Review
 - a. Fired Heater 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. Natural Draft Fired Heater Process and Control
 - a. Heater Temperature Control Loop
 - b. Draft Control Loop
 - c. Excess Oxygen Control Loop
- V. Exercises
 - a. Startup
 - b. Shutdown
 - c. Abnormal Situations
- VI. Post Assessment