

Analytical Troubleshooting

Course Number

10306

Course Duration

5 days

Audience

This course is designed for operations and maintenance technicians who perform troubleshooting and rectification of common turbo-machinery problems as part of their job function.

Prerequisites

Participants must have attended a Solar Operation and Maintenance Principles (O+MP) course and Turbotronic 4 Control System Operations (TT4 CSO) course, or have equivalent field experience.

Course Description

This course uses a combination of instructor-directed discussions and case-study exercises to enable the student to understand and apply common problem solving and analytical troubleshooting techniques, tools and processes. The overall intent of the course is to help the student solve common turbo-machinery problems in a more efficient way, and thus contribute towards a reduction in the resources, time, and overall expense in troubleshooting common package problems.

This course includes a review of root cause analysis, troubleshooting methodology, logic interpretation, and the use of the TT4 control system features during the troubleshooting process. The features covered include the use of project drawings and control system hardware indications; basic logic and malfunction interpretation; and the use of strip-charting and historical data analysis.

Classroom and hands-on laboratory exercises on Solar packages and/or package simulators are used to allow the students to practice and demonstrate the theoretical troubleshooting knowledge gained in this course. This includes extensive use of simulation software where realistic start sequence and operational malfunctions are introduced. The package simulation software and drawings used can be either a compressor set or generator set.

Course Objectives

On completion of this course, the student will be able to:

1. Describe the advantages of using an analytical approach to problem solving and troubleshooting
2. Describe the methods used in an analytical approach to problem solving and troubleshooting
3. Describe the steps in an analytical problem solving process
4. List and describe the features of the TT4 control system used to assist in troubleshooting turbomachinery faults
5. Demonstrate the ability to relate Alarms and Shutdowns to hardware and software elements
6. Demonstrate the ability to troubleshoot simulated faults using programming software on a Solar Turbines package or package simulator

List Of Lessons And Activities

Module 1 – Troubleshooting Principles

1. Introduction to Problem Solving Techniques
2. Root Cause Analysis
3. The Troubleshooting Process

Module 2 – Troubleshooting Using the TT4 Control System

1. Troubleshooting Methods
2. Interpreting Alarms and Shutdowns
3. Applying the Troubleshooting Methodology
4. Appendix A – Strip-charting Job Aid
5. Appendix B – Historical Data Analyzer Job Aid

Reference Material

Students receive a set of comprehensive workbooks and additional handouts. These materials are designed for classroom use and for reference purposes on the job.