Audits Of Existing Rotating Machinery Installations

Training program

Introduction:

Upon completion of this course, participants will gain a basic understanding of the main components and subsystems of audit procedures. They will learn to critique the advantages, applications, performance, and economics of different plant features and alternative features that audits may indicate need to be retrofitted. Participants will learn about the influence of various auxiliary systems including instrumentation and controls, process accessories, the process itself, and how this can contribute to an effective audit. They will also learn some basics about the role of operations personnel and training and how they can help maximize audit effectiveness. Participants will discover the basics required in minimizing operating cost and optimizing efficiency, reliability, and component longevity and will learn about the overall legislative limits the plant must operate within (including monitoring and control of environmental emissions) and any changes in same. They will gain insights into predictive and preventive maintenance, reliability and testing, and what that does for audit planning. Finally, they will discover some of the latest technology in all of the above and identify methods for self-improvement.

Who Should Attend?

Engineers, technologists, and other operational personnel who currently or may in the future be involved with the technology or business of running a process plant, a refinery, a power plant, and/or an oil and gas facility. Personnel can be involved in:

- Large scale commercial production and/or maintenance

- Smaller operations with smaller machinery that may be less complex
- Operations
- Maintenance, repair, and overhaul
- Systems optimization and performance verification
- Specification, retrofit design
- Business and management of machinery systems and personnel
- Support of machinery trains and their support systems

While this course is of major benefit to newer people in the field, it is also valuable as a revision and technology update for more experienced personnel.

Methodolgy:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include:

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate:

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration.

Course objectives:

This course on audits covers primarily:

- The basics of audit theory

- Basic audit planning strategy and specification of objectives
- The audit action items needed to optimize performance
- Key maintenance considerations and pitfalls

Sometimes audits happen just because they are a good step towards operational optimization. However, the reality of operating plants may mean that audits happen after a major failure or near failure. Plants that have regularly scheduled shutdowns and do not run their machinery "on condition only" are an exception. In these cases, the audit action list will evolve as the aging plant educates its operators.

Course outline:

✓ Introduction to Audits

- What are audits?
- How much time do they require?
- How do they affect warranty cases, Time Between Overhauls (TBO), Mean Time To Failure (MTTF), Mean Time Between Replacement (MTBR)?

✓ Aims of an Audit

- What are the various aims/events that prompt audits?
- How do these initiating factors affect time spent on an audit and its aims and objectives?

✓ Audit Planning

- How does audit planning evolve?
- What operational constraints decide how planning must proceed?

✓ General Audit Procedures

- How is information gathered?
- How does this information promote improvements to maintenance and operations?
- How might SOPs and SMPs procedures/inspections be altered/affected?

- ✓ Changing Legislative Requirements
- ✓ Retrofits Aimed at Operational Optimization

- I&C retrofits and case histories
- Performance analysis principles and case histories

- ✓ Specific Items in an Audit: Detection/Assessment/Planning

- Assess Requirements During Gas Turbine Operation

- ✓ Vibration used to assess gas turbine combustor problems
- ✓ Optimizing vibration analysis to extend its problem detection capability
- ✓ Anticipate repairs needed based on gas path analysis
- ✓ Assess changes made necessary by changing fuel/fuel composition
- ✓ Fuel treatment
- ✓ Financial factors with respect to fuel
- ✓ Assess required changes to cleaning procedures
- ✓ Hot section maintenance assessment

- ❖ Plan Maintenance Based on Operational Assessment

- Parts pools
- Repair development: OEMs or independents
- Warranty issues
- Plan the Next TBO/Overhaul
- Working Out Changes in Maintenance and Repair to OEM Specs

- ✓ Examples of Audits Prompted by Operational and Maintenance Information Revealed
- ✓ Some Decision-Making Philosophies Used to Assess Audit Findings

- Risk and weighting factors method
- General problem diagnosis
- Assessing the effectiveness of existing instrumentation
- Assessing the effectiveness of a condition monitoring package
- Starting from scratch
- Troubleshooting summary rules

✓ Strategy Summations, Summary, and Conclusions