



Operational Audits of Power Plants

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2009 Utility Internal Auditor's Training Course

“Operational Audits of Power Plants”

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The session will be an interactive discussion of the process for planning and conducting operational audits at power plants including:

- Training / Awareness
- Audit Protocols
- Identification of potential areas to audit
- Preliminary Surveys
- Data Analysis
- Interaction with plant management to facilitate acceptance of Audit
- Recommendations

Agenda

- Operational Audit Focus at SCE
- Audit Scenario – Power Plants
- Key Challenges
- Sample Audit
- Lessons Learned
- Conclusion



Operational Audits at SCE

- Company / Business Unit Goals and Objectives
- Policy / Guidelines
- Systems
- Processes
- Generating Stations (Nuclear, Coal, Gas)

Operational Audits

Definitions

- A technique for systematically evaluating the effectiveness of a unit or a function in order to assure management that its goals and objectives are being carried out and to identify opportunities for improvement.
- A review and assessment of the efficiency and effectiveness of operations and operating procedures.
- A systematic process of evaluating an organization's *effectiveness, efficiency, and economy* of operations along with making recommendations for improvement. Operational Auditing measures how well actual performance meets its measuring criteria, such as budgets, benchmarks, and other planning standards.

Why Conduct Operational Audits?

- Management may be too busy with day-to-day operations to look for efficiencies.
- Management may not recognize a need for change.
- Management may not have the tools or resources to capture the insights and ideas of employees.
- Management may need the auditor's analysis and objective report to sell changes to upper management.

Financial vs. Compliance vs. Operational

	Financial	Compliance	Operational
Objective:	Assess the fairness of financial statements	Determine the adherence to policies, procedures, laws and regulations	Evaluate and improve the effectiveness, efficiency, and economy of operations
Primarily for:	Stockholders	Regulators	Management
Audit Direction:	Looking back	Looking back	Looking present and to the future
Audits based on:	Financial reporting objectives, such as GAAP	Corporate standards of business conduct; internal policies; specific laws and regulations	Mission, vision and objectives of the organization and its management
Examples:	Annual audits performed by public accountants	Contract audits; Environmental audits	All other audits, such as those of departments, processes, information systems

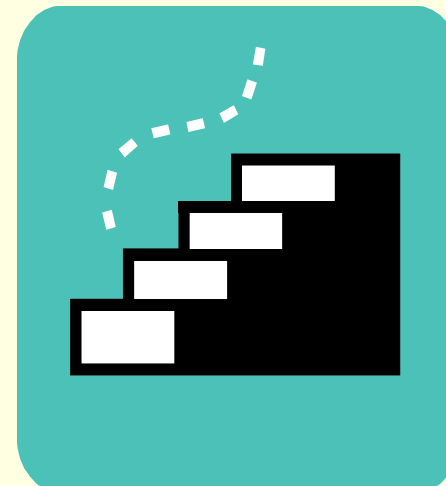
Audit Scenario

- Imagine you are an employee in the Operational Audits department.
- Your boss asks you to conduct an Operational Audit at the company's power plant.
- The scope and time duration is at your discretion.
- What do you do?



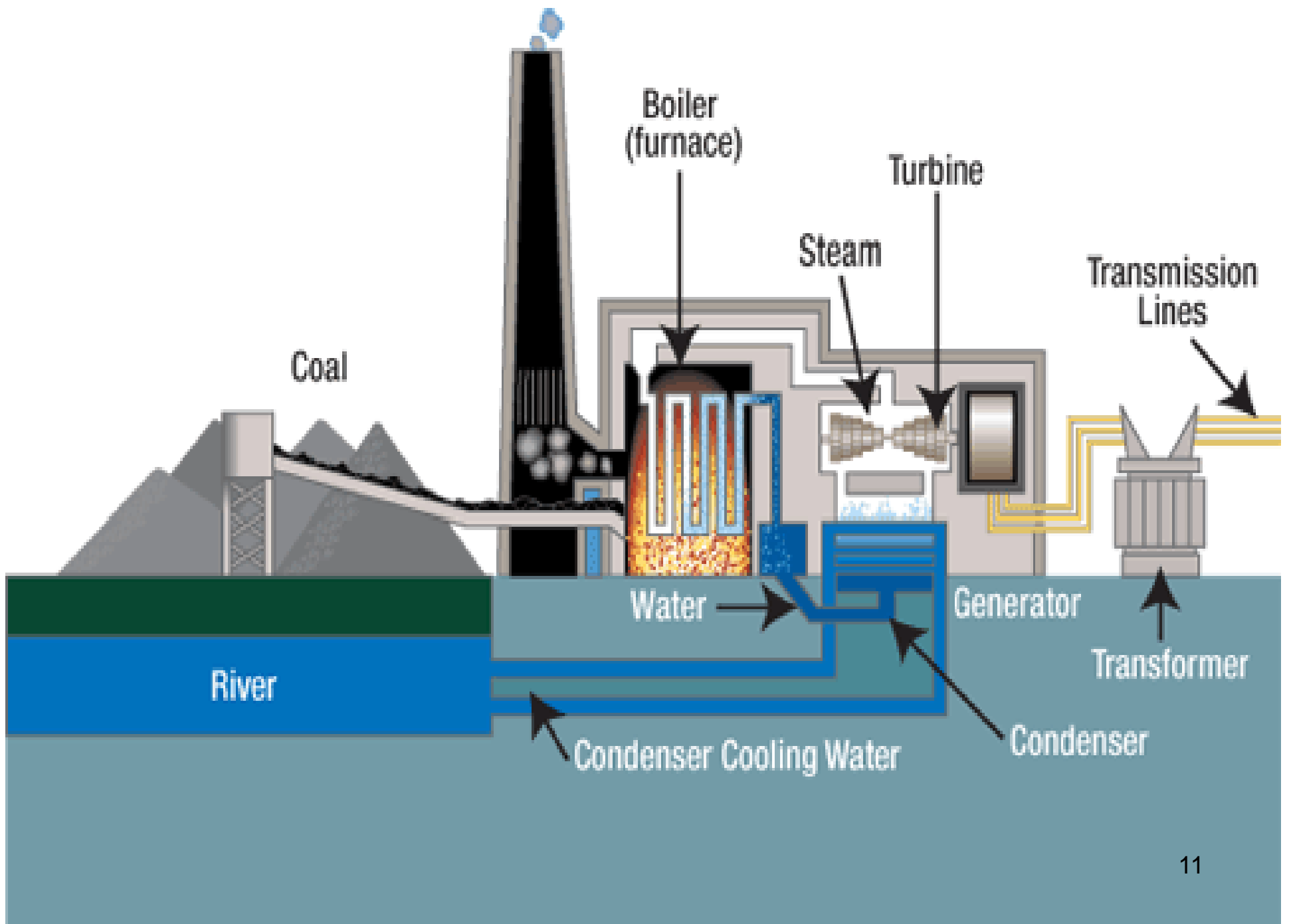
Next Steps

- Step 1: Research
- Step 2: Develop an Audit Plan
- Step 3: Prepare for the Audit



Questions to Ask Yourself

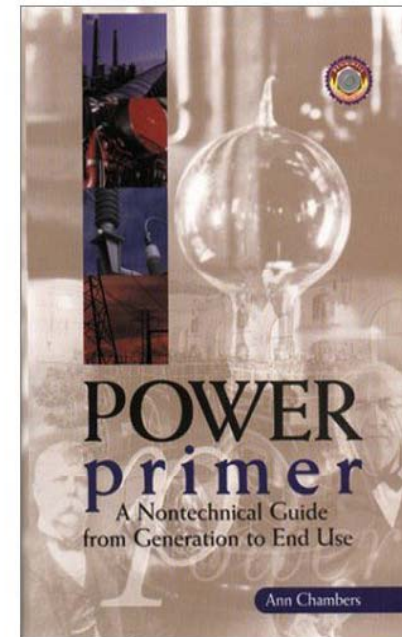
- What do I know about a Power Plant?
- Why perform an Operational Audit of a Power Plant?
- How will an Operational Audit improve the plant operations?
- What should I do to get ready?
- What should I audit?



Basic Things to Know

- Reference Material
 - Power Plant Books
 - Visit a Power Plant
 - Prior Audit Reports
 - Local Regulations

- Management's Concerns
 - Planning
 - Organizing
 - Directing
 - Controlling



Audit Phases

■ Planning

- Collect general and background information in order to assess the risks in the business, and to develop the objective and scope of the audit.

■ Audit Testing / Fieldwork

- Identify, analyze, and record sufficient information to achieve the engagement objectives.

■ Communicating Results

- Communications should include the engagement's objectives and scope, as well as conclusions, recommendations, and action plans.

■ Monitoring Progress

- The chief audit executive should establish a monitoring process to ensure management's actions have been implemented or management has accepted the risk of not taking action.

Potential Audit Areas

“Give a window into the soul of their control environment and activities”

■ Maintenance and Inspection

- Boiler and Pressure Vessels
 - Operating Certificates
 - Insurance Inspections
- Policies and Procedures
- Work Order Backlog System

■ Plant Operations

- Material Management and Inventory
- Fuel Storage and Transportation

Key Challenges

- Auditor Qualifications
- Management's Buy-In
- Timing of Audit
- Supporting Documentation
- Policies and Procedures
- Work Order Process

Audit Protocols

- Discuss with client management the engagement objectives, scope, and timing of the engagement
- Discuss with client management observations and recommendations as they are revealed
- Conduct an engagement Exit Conference with the client to discuss observations and recommendations, and receive management's action plan to address the observations
- Issue a Final Engagement Report with Management's response and action plans

How I Prepared the Team

- Visited Coal Power Plant
 - Received onsite training regarding basic Plant Operations
- Engaged with Power Plant management to learn about critical systems and equipment
- Discussed key systems and activities with Station Management

Background Information

- Find out what's important to Station Management
- Estimate the scope and duration of engagement
- Determine the staffing requirements and skills needed
- Develop a work program

Audit Objectives

- Provide an independent assessment of the controls over Maintenance and Inspection work practices

Audit Scope

- Compliance with Federal and State laws and regulations
 - National Board Inspection Code (NBIC) “R” Stamp code related work
 - American Society of Mechanical Engineers (ASME) B31.1 code related work
 - North American Electric Reliability Council (NERC) related system reliability

- Review of work order system and backlog

- Review of preventative maintenance work practices

- Review compliance with maintenance policies and procedures

Audit Fieldwork and Analysis

- Reviewed National Board Inspection Code (NBIC) “R” Stamp and American Society of Mechanical Engineers (ASME) B31.1 work packages
- Evaluated work order backlog database
- Reviewed preventative maintenance log
- Assessed the adequacy of company and corporate policies and procedures

Hypothetical Audit Observations

- Incomplete or missing R-Stamp and ASME B31.1 supporting documentation
 - R-1 Forms not approved by inspector
 - Quality Material Tags missing

- Excessive Work Order Backlog

- No formal process to address Work Order backlog

- No station-specific maintenance procedures

- Expired Operating Permits/Inspections

Desired Management Outcome

- Station Management would be receptive to audit recommendations
- Corporate Management would be more aware of station's strengths and weaknesses
- Senior Management would be assured of the effectiveness and efficiency of the power plant

Conclusion

- Prioritize audit fieldwork to address objectives and formulate observations and recommendations
- Understand the Regulatory requirements
- Research to gain an understanding of plant operations
- Work with station management to build rapport

Questions???

- Questions???