PDHonline Course C213 (8 PDH)

Environmental Health and Safety (EHS) Auditing

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ENVIRONMENTAL HEALTH AND SAFETY (EHS) AUDITING

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Introduction

- Auditing important since 1970's
- Number of environmental laws
  - Clean Water Act (CWA)
  - Clean Air Act (CAA)
  - Resource Conservation and Recovery Act (RCRA)
  - Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, Superfund)
  - Toxic Substance Control Act (TSCA)

Definition

- Snapshot of a facility's or property's status with regards to environmental, health and safety rules and regulations.

3 Types of Audits

- Regulatory Compliance
- Property Transfer Assessment
- Environmental Management System

Regulatory Compliance Audit

Regulatory Compliance Audits

- EPA Audit policy
- Why conduct an audit
  - Reasons
  - Benefits
- Disadvantages
- Legal aspects
- How to conduct an audit
- Regulation to be audited

EPA Audit Policy

- 1986 draft EPA audit policy statement
- 1995 final EPA audit policy statement
- Revised in 2000
- Included in the appendix to the course handout

EPA Policy Statement

- May 11, 2000 Federal Register
- Purpose:
  - Enhance the protection of human health and the environment
- Encourage regulated entities with regards to feral regulations
  - Voluntarily discover
  - Disclose
  - Expeditiously correct

EPA Incentives

- Elimination or reduction of gravity aspects of civil penalties
  - 9 conditions that apply for total elimination
- Determination not to recommend criminal prosecution
- Not requesting copies of the audits

Differences between 1995 final and 2000 revised policy

- Clarified some of the language
- Synchronizing with actual EPA policy
- Extending the reporting period 21 days

Conditions for Elimination of Penalties

- Violation is discovered through an audit or due diligence procedure
- The law didn't require the review of the audit
- The violation is disclosed within 21 days of discovery
- Discovery is independent of government or third party action
- The violation is corrected within 60 days

Conditions, Part 2

- Company commits to prevent a reoccurrence
- The same violation has not occurred within the prior three years and is not part of a pattern of violation
- No actual serious harm to the public health or environment has occurred
- The company cooperates with EPA

Safeguards in the Policy

- Entities must act to prevent reoccurrences
- Remedy any harm that may have occurred
- Repeat violations, violation that cause harm are not eligible
- Companies not allowed an economic gains over competitors
- Entities criminally liable for conscious violations

Gravity-based Penalty Incentive, 100% reduction

- Fines assessed components
  - Economic benefit
  - Gravity based
- Economic benefit derived from a violator's illegal competitive advantage
- Gravity based over and above economic benefit - punitive portion

Gravity-based, Part 2

- Must meet all nine conditions
- Recognizes compliance management systems can discover, correct and prevent violations
- May still collect economic benefits
- May waive economic benefit component if found to be insignificant

Why keep economic benefit component

- Recovery threat keeps companies interested in complying
- Fair, provides protection to law-abiding companies and helps "levels the playing field"

75% reduction

- Meets eight of nine conditions
- Doesn't have the system to discover violations
- EPA expects company to work with them to develop a systematic program

"No prosecution" incentive

- Does not focus on companies conducting audits unless possible criminal behavior
- May recommend prosecution of individuals
- Must meet eight of nine conditions, except the systematic discovery requirement

Incentives Not Available

- Corporate officials condone or willfully blind to violations
- Impose serious harm or endangerment to human health or the environment
- Criminal prosecution for individuals or subsidiaries
- Ultimate discretion reside with US Dept. of Justice

EPA routine audit report requests incentive

- EPA will not request reports to trigger investigations
- May seek report if has independent evidence of the violation

EPA Definitions

- Environmental audit is a systematic, documented, periodic and objective review by a regulated entity of facility operations and practices related to meeting environmental requirements

- Compliance management system encompasses the regulated entity documented, systematic efforts appropriate to the size and nature of its business to prevent, detect and correct violations through all of the following:
  - Compliance policy, standards and procedures that identify how employees and agents are to meet the requirements of laws, regulations, permits, enforceable agreements, etc. for environmental requirements

  - Assignment of responsibilities for complying with policy, standards and procedures and assigning responsibility for ensuring compliance at each facility or operation

  - Mechanisms for systematically ensuring compliance that standards and procedures are being carried out including monitoring and auditing systems reasonably designed to detect and correct violations, periodic evaluations of the overall compliance of the management system, and a means for employees and agents to report violations of environmental requirements without fear of retaliation.

  - Efforts to communicate effectively to regulated entities standards and procedures to all employees and other agents

  - Appropriate incentives to managers and employees to perform in accordance with the compliance policies, standards and procedures including consistent enforcement through appropriate disciplinary actions mechanisms to ensure prompt correction of any violations and development of preventive actions

Condition 1

- Systematic discovery
  - Environmental audit
  - Compliance management system
- Accurate and complete documentation as to how the system meets due diligence
- How entity discovered the violation
- Make a description of the system available to the public

Condition 2

- Voluntary Discovery
  - Not through a legally required statue, regulation, etc.
  - Not through required sampling and monitoring

Condition 3

- Prompt disclosure
  - Fully disclosed within 21 days
  - Less time if required by law
  - Time begins when any officer, employee or agent has a basis for believing that a violation has or may have occurred

Condition 4

- Discovery is independent of third party prior to:
  - A federal or state investigation
  - Citizens suit
  - Filing of a complaint by a third party
  - Reporting of the violation by an employee, etc.
  - Imminent discovery of the violation by a regulatory agency

Condition 5

- Correction and remediation
  - Corrects the violation within 60 days of discovery
  - Certifies that the violation has been corrected
  - Takes appropriate action, as determined nby EPA, to remedy any human health or environmental harm
  - EPA can order correction in a time shorter than 60 days, whenever it is feasible and necessary to protect human health and the environment
  - Notify EPA in writing if more than 60 days required (must be before end of 60 days) and may require entering into an agreement

Condition 6

- Prevention of a Reoccurrence
  - Improvement to its environmental auditing or compliance management system
  - Instituting an auditing or management system

Condition 7

- No repeat violations
  - The specific or similar violation has not occurred within the past 3 years at the same facility
  - Has not occurred at multiple facilities in the past 5 years

Condition 8

- No actual serious harm to the public health or environment has occurred
  - Resulted in serious actual harm or resulted in potential public health or environmental harm
  - Violates the terms of a judicial agreement, consent order, etc.

Condition 9

- The company cooperates with EPA
  - Provides information as requested

EPA Audit Policy Interpretative Guidance

- Q/A format
  - www.epa/gov
  - Included as Appendix in handout for this audio course

Problems with EPA Policy

- EPA Policy is full of uncertainties
- Audit results can be discovered through citizens suits
- EPA rejects the position that audits are privileged
- Audits given to state and local governments can be discovered
- Limits incentives to minor problems

Problems, Contd.

- Individuals can be charged with violations
- Policies have too much vagueness
- State/local policy statements do not protect from federal actions
- No protection for serious harm to environment or public
- No protection from citizen suits

Legal Protections

- Attorney/client privilege
  - Attorneys hire consultants to conduct audits
  - Consultants agree to protect findings
  - Not a part of an ongoing program

Reasons to conduct an audit

- Ensure regulatory compliance status
- Define existing and potential liability
- Protect company officials
- Investigate an acquisition or merger
- Track compliance costs
- Transfer regulatory information among sites and facilities
- Provide for management accountability
- Provide information to insurance companies
- Personnel training
- SEC requirements wrt environmental liabilities

Audit Programs

- Designed to verify that the regulatory compliance programs are in place, exist, in use and comply with regulatory requirements
- Provide an estimate of the liability for the failure to comply an worker exposure
- Protect the company officials from potential lawsuits and criminal charges

Audit Programs, part 2

- Evaluate the environmental management capabilities of personnel at a facility
- Isolate major deficiencies and help to correct them
- Locate areas of noncompliance and potential noncompliance
- Better public image
- Save environmental compliance costs

Disadvantages of an audit

- Requires a commitment of resources, both manpower and money
- Requires repeated use of resources
- Disrupts plant operations
- Presents unique legal issues
- Unclear nature of whether recommendations must be implemented, and the implication if they are not followed

Audit program must address

- Confirmation of compliance with environmental rules and regulations
  - Reporting and monitoring systems
  - Structure of system, including layout and personnel
  - Response to emergencies and changes
  - Investment in compliance equipment, etc.

- Identification of potential and current problem areas
  - Weaknesses
  - Solving problems internally
  - Protecting company assets
  - Strengths in programs to provide positive reinforcement
  - Recognizing potential areas of opportunities at the facility and other facilities
  - Potential to commercialize processes

Legal aspects of audits

- Reporting obvious violations
- Protection from discovery from potential lawsuits
- What to do with prior audit findings
- Control, access to reports
- Use corporate attorney and conduct audit under his/her direction

Invoking Attorney/Client Privilege

- Communication between attorney and management
- Communication must be made to obtain legal advice
- Communication must be confidential and controlled
- Privilege cannot be waived
  - Disclosure should be limited
- Attorney should be involved in establishing the audit program

Key elements of an audit program

- Planned in advance
- Written audit manual
  - Checklist(s) developed to be completed during audit
  - Pre-audit questionnaire
  - General guidance to the auditor
  - Background information to make the auditor familiar with facility and applicable regulations
  - Training of auditors

Audit program elements

- Procedures for the internal reporting of violations
- Audit management program elements
- Recordkeeping procedures
- Resolution of legal requirements

Keys to success

- Inspect all facilities and personnel to determine how well they are complying with corporate and regulatory requirements
- Evaluate all maintenance records
- Develop a written status report
- Designed to explain any deviations from the normal and provide recommendations for corrective actions
- Designed to operate as an independent function

Preparing the Audit Program

Audit Program Development

- Develop objectives and scope
  - All regulations
  - Specific regulations
- Purpose of audits
  - Compliance
  - Acquisition
- Structure
  - Full time corporate
  - Consultants
  - Other facility personnel

Development, contd.

- Should the audit be announced or a surprise
- Results be written or oral
- Documentation retention requirements
- Limited in scope or all encompassing
- Frequency of the audit
- Cover one facility or all facilities
- What regulations should be covered

Conducting the audit

- Pre-visit questionnaires to be used
  - Saves auditor time and reosources
- Size of audit team (limited to 1-5)
  - Fulltime/part time
  - Dedicated
- Duration of the audit (1 day-1 week)
  - Depends upon size of facility
  - Depends upon complexity of operations
- Procedures for pre-visit, onsite visits and post-audit should be developed

- Skills and training of the auditors
- Role of coporate attorney
- Training
- System to track corrective axtions

Audit Manual

- Provides a measure of audit consistency
- Ensures that everything is covered
- Checklists
- Table of contents
  - Introduction
  - Pre-audit tasks and questions
  - Checklists
  - Discussion of audit processes
  - Discussion of the audit report and its preparation

Manual, Contd.

- Outline procedures to review facility operations, organization and regulatory compliance
- Part of an auditor training program
- Basic facility information
- Guidance in preparing the audit report
- Summary of regulations that apply to the facility

Manual, Contd.

- Each applicable regulation should be detailed, discussing the recordkeeping and reporting requirements
- Details of corporate compliance procedures
- Facility structure and organization, i.e. chain of command
- Operations that sill be found

Manual, Contd.

- Pre-visit questionnaire
  - Completed by facility representative
  - Provides for a minimum of onsite disturbance
  - Requests regulatory files
  - Prepares the site for audit visit
  - Brief and asks for key regulatory and operating information
    - Pollution control equipment
    - Permits
    - Operating criteria
    - Regulations that apply

Manual, Contd.

- Checklists and protocols
  - Working document
  - Prompt the auditor
    - Compliance
    - Proper use of controls
    - Proper operational controls
  - Cover specific regulatory areas
  - May use forms to be completed
  - May need to change as regs change

Elements of a Checklist

- Abstract overview of the applicable regulations
- Dictionary of regulatory definitions
- Listing of all key regulations
- Appropriate inspection items to be covered
- Listing of internal guidance and procedures
- Tasks to be used to
- Space for comments

Audit report

- More than a manual of style
- Table of Contents
  - Scope
  - Completed Checklists
  - Chain of command
  - Findings

Auditor Team

- Key team members
  - Chemical/environmental engineers
  - Operations personnel
  - Budgeting/accounting personnel
  - Attorneys
  - Managers
- Designate a team leader
- Acquainted with regulations

Team leader

- Familiar with regulations that apply
- Able to focus team during the audit
- Prior audit experience
- Knowledgeable of operations

Training

- Based upon experience of audit team members
- Technically competent
- Understand auditing legal issues
- Posses interviewing and other interpersonal skills
- Familiar with the audit program
- May require continuous training
- Outline who should perform training
- Comply with standards of conduct

Audit Process

- Audit procedures and process
  - Pre-audit information gathering
  - Pre-audit interview with management
  - Records review
  - Facility inspection
  - Post-audit interview with management
  - Preparation of report
  - Implementation of the audit findings

Pre-audit information gathering

- Copies of regulations and permits
- Prepares auditors for on-site visit
- Uses pre-visit questionnaire
- Saves auditor on-site time
- Helps familiarize auditors with operations on site

Pre-audit interview

- Calms the manager and gets acquainted
- Prepares facility staff for audit
- Purpose and expectation of the audit is discussed

- Items to discuss
  - Introduction of team members
  - Purpose and scope of the audit
  - Authority under which it is being conducted
  - Advantages of the audit
  - Concerns of manager about the audit
  - Audit process
  - What the report will look like
  - What follow-up will occur
  - Schedule of audit events
  - Work areas required and provided
  - Permission to take photos of the site
  - Confidentiality to be included
  - Introduction of facility staff

Records review

- Can move fast if paperwork is already provided
- Operator log books should be evaluated
- Permits and reports reviewed
- Usually follows a brief site tour
- Conducted by team members based on their assignments

Site Inspection

- Use of checklists desired
- Relies on auditor vision and technical expertise
- Evaluate operating equipment

Post-audit interview

- Impressions of audit and impressions
- Discusses findings
- Presents corrective actions
- Immediate responses can be taken for serious violations

Audit Report

- Each team member should write his/her portion
- Team leader combines
- Sent to senior management with a copy to site management

Findings/Recommendations

- System to provide recommendations
- Ensure changes are made
- Methods of informing senior management
- Prepares corrective actions
- Computer based system to track

Key elements of success

- Top management support and commitment
- Independent functioning of team
- Adequate team staffing and resources
- Detail program objectives
- Outline of audit scope and resources

Elements, contd.

- Process to collect adequate information
- Specific audit procedures
- Quality assurance program
- Commitment to pursue recommendations from the audit

Team Size

- Based on budget
- Complexity of regulations
- Complexity of facility
- Big is not necessarily best
- Internal/external
  - Consultants should provide advice and train auditors only
  - Company employees keep programs within company
  - Internal reduces chances of audit being discovered

Audit Considerations

- Fresh eyes to view the facility
- Company personnel from division or corporate
- Use sister plant auditors
- Plant personnel most familiar with operations
- Best to start with a media-specific audit
- Could include contractors and vendors
- May include off-site facilities
- Include regulators
- Restrict to a representative or only major facilities

Audit Frequencies

- Annually for major facilities
- One time for a small unregulated facility
- Biannually for a moderately regulated facility
- Poorly performing plants more frequently

Conducting an audit

Review

- Applicable regulations
- Corporate and facility policies, procedures, etc.
- Study pollution control equipment
- Characteristic waste streams, pollutants and toxic chemicals

Inventory/Assess

- Documents
- Forms
- Manifests
- Permits
- Inspection reports
- Maintenance/operating logs
- Analytical results
- Monitoring data

- Assess the effects of the facility on the environment
- Inspect pollution control equipment and operations
- Inspect pollution generation equipment and operations
- Judge wrt environmental criteria

Types of audits

- Structured programs
- Less formal programs

Audit phases

- Preparation for the audit
- Interview with plant management
- Collecting plant information
- Touring the plant
- Visiting with regulators
- Reviewing findings
- Writing the audit report

Auditor knowledge

- Taking short courses
- Understanding regulations
- Interpreting regulations
- Engineering knowledge
- Understanding of science
- On the job experience

Audit preparation tasks

- Defining the audit parameters
- Collecting preliminary information
- Preparing the materials and equipment needed to perform the audit

Audit parameters

- Scope of audit
- Management decision
- Amount and type of information determines ho long it will take to prepare for it

Preliminary information

- Operations
- Address, etc.
- Safety requirements
- Local governing bodies
- Land use surrounding
- History
- Key individual names
- Products/services provided

- Power loads
- Byproducts and waste produced
- Regulatory areas covered
- Emission sources
- Control equipment
- Problem areas
- Discharge points
- Permits
- Haulers and TSDF's used
- Spill protections and history
- Provided by a questionnaire

Audit materials

- Checklists and data forms
- PPE
- Safety shoes
- Camera and film
  - Instant
  - Digital
- Tape measure
- Sampling equipment

Photographs

- Obtain permission before taking
- Have camera with adjustable exposure and focus settings
- Have a flash available
- Name of photographer
- Date and time photograph taken
- Description of the photo
- Direction taken

Data inventory forms

- Data form for each
  - Air emissions
  - Water emissions
  - PCB storage
  - Waste storage
  - Tanks
- Design depends upon the complexity and type of facility
- Forms should describe control equipment
- Guide for conducting audit
- Aids in the preparation of the final report

Sampling

- Take duplicate samples
- Have independent analysis
- Sampling equipment
  - Air monitoring
  - Wastewater sampling
  - Personnel sampling
  - Noise sampling
  - Jars to hold sampling

Other equipment

- Manometers
- Pietot tubes
- Pocket thermometers
- Duct air flow meters
- Sound level meters
- Indicating tubes and pumps for gasses
- Water quality test kits
- Air test kits

Other pre-audit tasks

- Determining team member assignments
- Detailed schedule
- Review audit protocols and manual and determining what applies to the specific audit

On site inspection

- Must be conducted to be:
  - Efficient
  - Comprehensive
  - Cover all regulatory areas
  - Consistent

Meet with plant manager

- Make appointment ahead of time
- Plant manager may be negative
- Discuss
  - Introduction of auditors
  - Authority of audit
  - Purpose of audit
  - Advantage of audit
  - Confidentiality
  - Concern of plant manager
  - Previous visits by regulatory agencies

- How the audit will be conducted
- How the report prepared and distribution
- What follow up will occur
- Audit schedule
- Requests for facility information
- Work area
- Camera permission
- Access to all areas
- Staff introductions
- Knowledge of plant manager

Confidentiality

- Unforeseen hazards
- Improper disposal practices
- Ensuring findings not become public
- Attorney/client privilege
- Expensive compliance activity or clean ups
- Keeping it internal
- Actual or impending regulatory inspections

Other plant manager concerns

- Adequacy of specific pollution control equipment
- Legitimacy of disposal practices
- High cost of compliance
- Uncertainty of plant practices
- Media relations
- Special permission sought by auditors

Work Space

- Desks
- Tables
- Computer access
- Telephone
- Near files and copy machine
- Smaller space than a conference room to reduce interruptions

Other Issues

- Discuss the audit schedule
- Discuss hours of operations
- Discuss Post-audit schedule
- Staff Introductions

Audit schedule

- Day 1
  - Interview with manager
  - Facility tour
- Day 2
  - Inspect files
  - Detailed facility tour
- Day 3
  - Continue facility tour

- Day 4
  - Visit regulatory agencies
  - Interview regulatory/operations staff
- Day 5
  - Exit interview with personnel

Day 1

- Meeting with environmental coordinator
  - Assistant to audit
  - Maps and plot plan of plant
  - Plant layout and system flow sheets
- Walk around the plant
  - Familiarize with plant layout
  - May take 1-2 hours
  - Have coordinator accompany team
  - Develop questions to seek answers to
  - Location of files

Day 2

- Records review
- Personnel interviews

Records

- Recordkeeping systems
  - May be located in several areas
  - Look at each paper and conduct an evaluation
  - Sort by media
  - Record data on forms
  - Memos, reports, invoices, etc.

Records review

- Break into media areas
- Use checklists
- Review each piece of paper
- Interview staff based on records
- Raw materials
- Waste generated
- Finished products
- Mass balance

Interview

- Personnel associated with environmental issues
  - Environmental coordinator
  - Purchasing manager
  - Quality assurance manager
  - Shipping supervisor
  - Electrician
  - Maintenance foreman
  - Lab manager
  - Operators
- Different for each facility
- Use plant diagrams to determine most appropriate

Day 3

- Plant tour
- Pollution control systems
  - Outfalls
  - PCB equipment
  - Oil storage tanks
  - Waste storage and disposal areas
- Provide data to verify that equipment are as previously described
- Identify any areas of environmental impacts not previously known

Tour, Part 2

- Conducted in segments
  - Walk around plant perimeter
    - Valuable way to uncover unpermitted outfalls or disposal areas
  - Inspect various manufacturing areas
  - Chemical units
  - Tank farads
  - Storage areas
  - Shopping ands receiving areas
- Conduct each segment separately or by individual audit team members

- Complex facility
  - Use individual diagrams to determine segments
  - Consider as a small plant
  - Examine individual subunits
  - Use checklists for specific areas
  - Use clip board to segregate units
  - Use camera to aid memory and show condition of units and discovered non-compliance issues
  - Get detail for each photo

Photo taking

- Items of interest
- Background to show location
- Include scale using known items, such as humans
- Lighting details are important
- Instant photos can be retaken
- Identify photos with written details
- Number and date each photo
- Recorded in a log sheet
- Evaluate each photo

Record equipment information

- Nameplate information
- Conform with checklist
- Record variances
- Visible indications of proper and improper operations
- Meter and gage readings
- Signs of deterioration
- Signs of poor maintenance

Inspection

- Make sure all areas covered
- Check roofs for vents, etc.
- Make sure they are noted
- Fill out forms for discovered area
- Look for areas no longer operating or removed
  - May need to remove these from permits
- New plant tour segment should be started as each is completed
- Complex facility may require several days to complete tours

Team members

- May conduct tour segments separately
- Should compare notes frequently
- Serve to assist each other
- Should conduct perimeter tour as a group

Perimeter tour

- No specific checklists
- Purpose of discovery
- Perimeter areas should be mowed
- Looking for
  - Unauthorized outfalls
  - Contaminated runoff
  - Trash accumulations
  - Abandoned equipment
  - Evidence of process upsets
- Photograph areas discovered

Important information

- Sort and organize information from inspections
- Identify apparent violations
- Ensure all questions are answers
- Proper interviewing integral

Interviewing

- At the work spaces of individuals being interviewed
- Conducted during plant tours
- Schedule ahead of time
- Allow the interviewee to prepare for it
  - Purpose of audit
  - General questions to be asked
  - Types of documents to be reviewed

Interviewing, contd.

- May have others available for interviewing
- Have at least one day in advance
- Interviewing at work space
  - Interviewee more relaxed and less defensive
  - Key records often located at work space
  - Opportunity to observe workplace conditions and staff attitudes
  - Distractions and interruptions will likely occur
  - Noisy in work places

Interviewing, part 3

- Sensitive to interviewee's nervousness
- Reassure purpose of audit
- Not an audit of the interviewee
- Not a threat to job security
- Uncooperative interviewees should be handled by managers
- Should not seek to interrogate, when interviewee is struggling

Interviewing, part 4

- Focus on getting interviewee to open up
- Not secure only yes/no answers
- Ask open ended questions
- Follow up answers with more questions

Agency Interviews

- Almost as familiar with plants as plant staff
- Different from region
- Not practical to meet all agencies
- May seek to not interview during first audit
- Discussions with inspectors from agencies
- Record review

Agencies, part 2

- Determine agency attitude towards
- Do not seek to negotiate for the facility
  - Discourage agency personnel from giving an unbiased viewpoint
  - Tone of conversation then not about the overall compliance of the facility
- Learn as much about agency's view of the problem without offering any rebuttal

Agency, part 3

- Request copies of information not in facility's files
- Request a copy of latest regulations
- Offer to correct errors in files, specifically part of emission data
- Try to get agency's input on latest NOV's etc.

Coordinator interview

- Discuss with environmental coordinator
  - Missing information
  - Fill in gaps
  - Resolve questions wrt permits, malfunctions, etc.
  - Review overall perception on compliance program
  - Eliminate misconceptions of audit team
- May take several hours

Coordinator, part 2

- Do not focus on negative findings only
- Provide positive feedback
- Do not provide detailed oral report
- Discuss corrective actions required
- Reporting obligations should be emphasized
- Supply answers to auditor questions
- May require an additional walk through
- Have coordinator look over all worksheets
- Auditor brings observations from other plants
- Provide follow up actions

Post audit meeting

- Idea direction of compliance costs
- Adequacy of current control devices
- Whether the personnel are following rules, policies and procedures
- May require immediate actions
- Express in positive terms
- Attitude of management based on audit team attitudes

Post-audit, part 2

- Should discuss positive aspects of audit findings
- Review what was learned by interviewing regulatory agencies
- Discussion of potential liabilities
- List of recommendations for violations or potential violations
- To do list to correct environmental problems that do not pose immediate problems

Post-audit, part 3

- Prioritize list of recommendations
- Communicate a wish list to improve compliance
- Pollution prevention ideas and opportunities
- Steps to be taken regarding future regulations
- Note manager comments

Post-audit, part 4

- Agreements should be documented in audit report
- Plant manager to correct incorrect information and misconceptions

Report

- Written intended for corporate or plant management
- Findings of audit team
- Note lapses of system
- Documents where policing of systems has been inadequate
- Effective tool to upgrade plants compliance management system

Report, part 2

- Format should meet conditions of the original audit purpose
- Format varies
  - Audits designed to assist plant management in obtaining or maintaining compliance (recommendations)
  - Audits designed to inform corporate management of potential and real liabilities (factual information)

Report, part 3

- May have to issue two reports, one for plant, one for corporate
- Start with audit purpose
- List dates and audit team members
- Can be used as evidence of plant's compliance status report

Report sections

- Executive Summary
- Introduction
- Scope of work
- Review of Findings
- Conclusions and recommendations

Introduction

- Audit purpose
- Dates of audit
- Times of audit
- Audit participants
- Summary of plant facilities covered
- Procedures followed during the audit
- Summary of recommendations

Audit scope

- Brief description of facility including history
- Environmental impacts of facility
- All environmental permits and restrictions
- Review of regulations affecting facility
- Review of corporate policies, procedures, etc.
- Violation histories

Findings

- Including worksheet summaries
- Description of each source of environmental impact
  - Identification of each
  - Assessment of compliance of each with applicable regulations and policies
  - Acknowledgement of proper operation
  - Listing of each deficiency

Conclusions

- Comments, both positive and negative regarding plant operations
- Specific recommendations needing prompt corrections
- General recommendations on policies and procedures
- Narrative summary of plant status
- Assessment of liabilities
- Restrictions to expansion
- Reviewing environmental control systems against present and future regulations

Conclusions, part 2

- Comprehensive summary of reporting requirements
- Inventory of worksheets

Types of audit reports

- Plant management report
  - Brief
  - Turned over to other managers
  - Little emphasis on background information
  - List findings and recommendations
    - Those that must be followed immediately
    - Those that are discretionary and not mandatory
  - Schedule follow up visit

Reports, part 2

- Non-mandatory items
  - Energy efficiency
  - Pollution prevention opportunities
  - Waste reductions and avoidances
  - Quality considerations
  - Maintenance efficiency
  - Cost avoidance items
  - Byproduct and product recovery
- Look at regulatory trends

Reports, part 3

- Corporate reports
  - Comprehensive
  - Details of the plant
    - History
    - Surroundings areas
    - Operations
    - Regulatory environment
    - Product lines
    - Compliance history
  - Names of audit team and each employee interviewed

Reports, part 4

- Questionnaires and data sheets in appendix
- Detailed review of regulations and policies based on media
- Only areas of liability should be covered if in the scope of audit
- Specific findings and general trends
- Mention only violations based on root causes
- List of recommendations as decision guidelines

Reports, part 5

- Undergo a review from
  - Legal
  - Plant management and staff
    - Facts only
- Review audit report by plant management before publishing as final

Follow up

- Ensure recommendations are followed
- Requiring comprehensive management system
- Assess effectiveness of recommendations

Specific Regulations Covered in an Audit

Major environmental laws

- Clean Air Act
- Clean Water Act
- Resource Conservation and Recovery Act
- Comprehensive Environmental Response Compensation and Liability Act
- Superfund Amendments and Reauthorization Act
- Emergency Planning and Community Right to Know Act
- Toxic Substances Control Act
- Pollution Prevention Act
- Safe Drinking Water Act
- Federal Insecticide, Rodenticide and Fungicide Act
- National Environmental Policy Act
- Hazardous Materials Transportation Act

- For a more detailed summary of listing more specific regulations see Appendix to this handout.

Major EPA regulations 40 Code of Federal Register (CFR)

- Air, 49-97
- Water, 100-135
- Drinking Water, 136-149
- Pesticides, 150-180
- Radiation, 190-197
- Noise Abatement, 201-211
- Ocean Dumping, 220-238
- Solid Waste, 240-258
- Hazardous Waste, 260-282

EPA, Contd.

- Superfund, 300-374
- Pretreatment, 401-471
- Sewage Sludge, 501-503
- Energy Policy, 600-610
- Toxic substances, 700-799
- Air Pollution Control, 1039-1068

Major health and safety regulations 29 CFR 1910. Subpart

- A - General - .1-.8
- B – Federal Standard - .11-.19
- D – Walking Working Surfaces - .21-.30
- E – Means of Egress - .33-.39
- F – Powered Platform - .66-.68
- G - Occupational Health - .94-.98
- H – Hazardous materials - .101-.126
- I - PPE - .132-.138
- J – General Environmental - .141-.147
- K – Medical and First Aid - .151-.152

OSHA – Contd.

- L – Fire Protection - .155-.165
- M – Compressed gases - .169
- N – Materials handling - .176-.184
- O – Machinery - .211-.219
- P – Hand and Portable Power Tools - .241-.244
- Q – Welding, Cutting - .251-.255
- R – Special Industries - .261-.272
- S – Electrical - .301-.399
- T – Commercial Diving - .410-.441
- Z – Toxic/Hazardous Substances - .1000-.1450

Major DOT 49 CFR

- Hazardous materials and oil transportation, 105-110
- Oil transportation, 130
- Hazardous Materials, 171-180, 172

Environmental Management System (EMS) System Audits

Stages of an EMS

- Unprepared (noncompliance)
- Aware/Reactive (in compliance)
- Proactive/Participatory (pollution prevention)
- Mainstreaming (management system)
- Mature and Highly Integrative (sustainable development)

What is an EMS?

- An environmental management system is the organizational structure, procedures, processes and resources needed to implement and maintain policies, objectives and responsibilities, utilizing all planned and systematic activities including control mechanisms and continual improvement addressing an organization's affect upon the environment.

ISO

- Charted in 1946
- First developed ISO 9000 – Quality
- In 1993 – EMS started
- 1996 - Published as final
- Voluntary

ISO 14000 Series

- 14001 – EMS
- 14004 – EMS Guidance
- 14010 – Principles of Auditing
- 14011 – Procedures for auditing
- 14012 – Auditor qualifications
- 14031 – Environmental Performance Evaluation Systems

Life Cycle Assessment (LCA)

- 14041 – Guiding principles of LCA
- 14042 – Inventory analysis
- 14043 – Impact Analysis
- 14044 – Improvement Assessment

Environmental labeling

- 14021 – Principles of all claims
- 14024 – Eco-label seal of approval programs
- 14025 – Manufacturer self - declaration claims
- 14060 – Environmental aspects in product standards

EMS Drivers

- Mandated by international trade
- Government or contractor requirements
- Regulatory enforcement agencies
- Eliminating duplicative audits
- Greater public confidence in company
- Marketing advantages

EMS Benefits

- Ensure environmental/regulatory and legal compliance
- Achieve trade group recognition
- Assist with employee succession and retainage
- Save money and other resources
- Improve operating efficiency
- Address potential privatization
- Provide examples of leadership
- Improve public image
- Improve environmental performance
- Reduce environmental risks
- Get a better bond rating

Developing an EMS

- Long term objectives required
- 6-24 months to develop
- Consider other systems developed to reduce costs
- Integrate with other systems

EMS Elements

- Legal requirements
- Environmental aspects
- Life cycle analysis
- Allocate resources
- Pollution prevention
- Measure performance against policy
- Audit system
- Lines of communication, both internal and external
- Encourage suppliers

Environmental Management System (EMS) Basics

Some Basic Elements

- **Plan**
  - Identify significant environmental aspects
  - Establish program goals and objectives
  - Develop policy
- **Check**
  - Conduct audits
  - Monitor and measure
  - Prepare corrective actions
- **Do**
  - Conduct training
  - Establish operational Controls
  - Develop environmental management program
- **Act**
  - Review progress
  - Make necessary changes

Success Factors

- Commitment from senior management
- Designate staff to be a Core Team to act as a cheerleader
- Committed EMR
- Involvement of all employees within the fenceline
- Dedicated resources
- Requires a link to overall strategic plan of organization
- Requires sufficient time to develop and implement the EMS
- Proper follow through on the checking and acting components
- Willingness to make the cultural change required of the program

EMS Principles for Managers

- Recognize environmental management has a high priority
- Create a process to communicate
- Determine applicable legal requirements
- Foster commitment to protect environment
- Assign responsibilities
- Encourage life cycle assessments
- Locate resources, including training
- Review audit results
- Work with contractors and suppliers

Environmental Policy

- Should cover the following
  - Pollution prevention
  - Compliance with legal and other requirements
  - Continuous improvement
- Broad and limited to 1 page
- Consider organization's environmental mission, vision and core values
- Framework for setting objectives and targets
- Communicated both internally and externally

Planning

- Environmental aspects
- Legal and other requirements
- Objectives and targets
- Environmental management program

Key Definitions

- **Environmental Aspect** – The element of an organization's activities, products or services that can interact with the environment.
- **Environmental Impact** – Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services, can be positive or negative

Legal and Other Requirements

- Legal and Other include
  - Laws and regulations
  - Permits
  - Enforcement actions
  - Standards and codes
- Establish a master list of these and maintain it frequently

Objectives and targets

- **Environmental Objective** – An overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve, which is quantifiable, where practicable. Ex. Reduce energy usage.
- **Environmental Target** – A detailed performance requirement, quantified where practicable, that arises form the environmental objectives and that needs to be set and met in order to achieve those objectives. Ex. Reduce blower energy usage by 20% within one year.

Environmental Management Program (EMP)

- Designate responsibility parties across entire organization
- Designed to meet objectives and targets
- Names and time frames to achieve

Implementation

- Roles and responsibilities
  - Resources
  - Designate names or positions
- Training, awareness and competence
  - Importance of conformance with practices and procedures of EMS
  - Environmental impacts of their jobs duties
  - Roles and responsibilities for achieving EMS conformance
  - Consequences of deviating from EMS

Implementation, contd.

- Communication
  - EMS and environmental aspects
  - Internal
  - External
- Documentation
  - Paper or electronic
  - Direction
- Document Control
  - Locate
  - Reviewed and revised

Implementation, page 3

- Operational controls
  - Identified with environmental aspects
  - Maintenance
- Emergency preparedness/response
  - Accidents
  - Mitigate environmental impacts
  - Test

Checking

- Monitoring and measuring
  - Documented procedures
  - Calibration
  - Records
- Nonconformances/Corrective Actions
  - Procedures to handle and investigate nonconformances
  - Procedures to correct
  - Implement and record changes to Procedures

Checking, Page 2

- Records
  - Procedures to identify, maintain and disposition
  - Legible, identifiable, traceable
  - Training, audits
  - Stored and maintained to be retrievable
  - Retention time established

Checking, page 3

- Management system audits
  - Periodic
  - Determine if EMS complies with standards
  - Procedure
    - Scope
    - Frequency
    - Methodology
  - Roles and responsibilities for auditors

Checking, page 4

- Management review
  - Top management conducts and sets frequency
  - Continuing suitability, adequacy and effectiveness
  - Ensure process supports
  - Documented
  - Address policy, objectives, etc.

EMS Document Pyramid

- Policy
- Manual
- Procedures
- Operating criteria
- Records
- EMS Document directory

EMS Manual

- 25-30 pages
- Overview of the EMS
- Identify management functions
- Communicate environmental policy and objectives
- Reference EMS procedures
- Briefly address requirements of ISO 14000
- Not required by ISO 14000
- Separate document or a part of it
- Can be used in training

EMS Manual, Part 2

- Which EMS elements apply to the unit
- Draft should contain
  - Title, scope and field of application
  - Table of contents
  - Introduction
  - Date of issue, how modified and updated
  - Policies and objectives
  - Organizational structure
  - EMS elements
  - EMS Definitions
  - Cross references and index
  - Appendix

Procedures

- Purpose
- Scope
- Responsibilities
- Activities are performed, where and by whom and why
- Documentation required
- What controls are to be applied
- Involve supervisory and operating staff in writing
- 2-10 pages
- Written, diagrams, flow charts, videos
- Use simple words and short sentences
- Should have date of issue, issuer, etc.

Operating Criteria (Work Instructions)

- Tells the how to conduct a procedure or task
- Also referred to as an SOP
- Step by step
- 1-2 pages
- Operating criteria,
- How to start up, operate, shut down, monitor, etc.

Records

- Include
  - Permits
  - Employee training
  - Audits and other reviews
  - Monitoring records
  - Correspondence
- Retained to demonstrate conformance with EMS

Records, page 2

- Legible
- Identifiable
- Traceable
- Protected form lost or deterioration
- Retention time for each

Document Control

- Written procedure
  - Identification
  - Indexing
  - Filing
  - Collection
  - Stager
  - Maintenance
- Periodically reviewed and revised, updated and approved
- Current editions must be available at all locations that are affected
- Ensure expired documents are promptly removed
- Standardized

EMS Audits

- Three levels
  - First party
  - Second party
  - Third party
- First party evaluates its own EMS, internal audit
- Second party evaluates suppliers, contractors, etc.
- Third party evaluates for certification or regulatory compliance

ISO definition

Audit – A planned, independent and documented assessment to determine whether agreed upon requirements are being met

ISO 14000 audit documents

- 14010
  - General principles
  - Guidance on how to conduct an audit
  - Terms and principles
- 14011
  - Establishes a general procedures for how to conduct an EMS audit
- 14012
  - Auditor qualifiactions

EMS Audit

- How well does the EMS as a whole commit to achievement of the environmental objectives, regulatory and other requirements?

Audits, page 2

- Measures adequacy of the EMS
- Not regulatory compliance
- Documentation is reviewed
- Key activities observed
- Objective evidence is gathered
- Verifies whether the EMS meets program objectives
- Conducted periodically

Audits, page 3

- Conforms to planned arrangement so environmental management
- Determine if the EMS has been properly implemented and maintained
- Provide information on the status of the EMS in the form of the audit results

Audits, page 4

- Different from regulatory audits
- Regulatory audits evaluate against legal requirements
- Scopes of EMS audit looks at the big picture
- Scope of regulatory audit is to evaluate against specific requirements
- EMS audit may spot check for compliance

3rd Party audit

- Certification
  - Objective evidence to verify whether EMS is functioning as described
  - Whether the EMS conforms to ISO 14001 or another standard
  - Certification of registration may be issued if the audit conforms
- Self-declaration
  - Declares publicly that it conforms
  - Not as useful

Audit principles

- Auditors must
  - Be knowledgeable of the system and processes being evaluated
  - Demonstrate good interviewing and communications skills
  - Be independent of the activity being audited
  - Act objectively
  - Possess strong research skills
  - Know what to look for

Planning an EMS Audit

- Selection of an audit team
- Determination of audit objectives and scope
- Identification of the audit criteria
- Planning of the audit program
- Confirmation of the audit with the client
- Developing checklists and working documents

Lead Auditor

- Select a lead auditor
  - Leads the audit team
  - Plans the audit program
  - Selects the other auditors
  - Ensures the audit success
  - Manages the audit to ensure that it is effective, efficient and completed within the boundaries

Lead Auditor, page 2

- Defines the scope of the audit in consultation with the client
- Collects background information
- Verifies that ISO 14000 elements have been met
- Ensures there are no conflicts of interest among team members
- Assigns and directs audit team tasks
- Coordinates the development of checklists, protocols, etc.

Lead Auditor, page 3

- Briefs audit team
- Mediates problems encountered during the audit
- Represents the audit team in meetings with facility representatives
- Reports the results of the audit to facility
- Makes final decisions for the audit team

ISO Lead Auditor qualifications

- Demonstrates an understanding of the EMS
- Selected by the client
- Should have completed 15 hours of auditing
- Should have completed at least 3 audits
- Completed an audit as an acting lead auditor
- Criteria met within 3 years

Define the scope and objectives of the audit

- Lead auditor and client determine scope and objectives
- Scope determines background of other audit team members
- Objectives, what do I want to get from the audit

Audit objectives

- Reasons for conducting the audit
  - Determine if EMS conforms with the EMS criteria
  - Determine of the EMS has been properly implemented and maintained
  - Identify areas where improvements can be made to the EMS
  - Ensure suitability and effectiveness of EMS
  - Meet the requirements of a customer or facility
  - Prepare for an ISO registration

Boundaries of the audit

- Scope
  - What am I auditing?
    - Organization
    - Facility
    - EMS elements
    - Activities
    - Organization
  - What criteria am I auditing against?
    - ISO standards
    - Regulatory requirements

Audit team

- Client determines size and make up of team
- Consider familiarity with the processes, facilities, etc. being audited
- No. of auditors needed
- Potential conflicts of interest
- Requirements of the facility

Team composition

- How many days and auditors are needed
- Large organizations require more due to size and complexity
- Smaller organizations may need only 2 auditors
- Schedule audits by area
- May need technical experts

Team Tasks

- Collect, analyze, interpret and document audit findings and evidence
- Auditors should
  - Follow lead auditor's direction
  - Carry out assigned tasks
  - Prepare and develop working documents
  - Collecting and interpreting audit evidence
  - Documenting audit findings
  - Safeguarding documents
  - Assisting in the writing of the audit report

ISO Auditor qualifications

- Education and work experience
- Five years work experience in below areas
- Knowledge of the following:
  - Environmental science and technology
  - Environmental aspects of operations
  - Regulations
  - EMS systems and standards
  - Audit procedures, processes and techniques

Qualifications, page 2

- Formal and on the job training in auditing
- OJT should cover 4 audits and 20 work days
- Occurred within 3 years
- Posses skills
  - Speaking and writing abilities
  - Strong interpersonal skills
  - Act objectively
  - Be organized
  - Ethical
- Continue to maintain skills and knowledge though education

Selecting an auditor

- Interview candidate
- Give a written and oral assessment
- Review of written work
- Contact former employers, etc.
- Create a role playing exercise
- Participate in audit under direction
- Consider professional certifications and licenses

Auditee requirements

- Inform employees and seek cooperation
- Provide facilities
- Providing hosts for the audit team
- Provide access to records, personnel and operations
- Cooperating with auditors
- Receives audit report and determines corrective actions

Audit items

- Policies
- Procedures
- Practices
- Requirements

Audit criteria

- Compare to determine conformance and nonconformance
  - Standards
  - Guidelines
  - Organizational requirements
  - Regulatory requirements
  - EMS manual
  - EMS aspects, objectives

Audit plan

- Include:
  - Audit scope, objectives and criteria
  - Areas or functions to be audited
  - Individuals with EMS responsibilities
  - Elements of EMS that have high priority
  - Company procedures for auditing
  - Guidance on how the audit is to be conducted and reported
  - Identification of key reference documents

Audit plan, page 2

- Dates and places for the audit
- Expected time for audit activities
- Identification of audit team members
- Schedule of meetings
- Confidentiality requirements
- Retention requirements
- Audit report criteria

Working documents

- Forms for documenting supporting evidence and findings
- Procedures and checklists to evaluate EMS elements
- Records of meetings
- Maintained until the audit is completed

Checklists

- Structured list of points to evaluate
- Each point addressed as an open-ended question
- Intended to draw out information about the specific subject
- Guides the course and conduct of the audit
- Good format for recording objective evidence

Items on checklists

- Audit criteria
- Department procedure or function to be audited
- Key points to be evaluated
- Asks the following
  - Who
  - What
  - When
  - Where
  - Why
  - How
  - Show me

Lead auditor tasks

- Review the EMS documentation
  - Red flag if major problems encountered
- Verify that the EMS conforms to ISO 14001
- Samples the elements to determine if the EMS conforms
- Ensures the system has been properly implemented and maintained

Document review

- Before on site audit occurs
- Conducted by Lead Auditor
- Understand the core elements and interaction
- Review of:
  - Environmental policy
  - EMS Manual
  - Procedures, programs and records
  - Documents that describe the EMS requirements
  - Significant environmental aspects lists

Audit opening meeting

- Conducted by lead auditor
- Introduces audit team members
- Details the purpose of the audit
- Meets with operations managers
- Confirms details of the audit
- Reviews schedule and audit elements
- Determines logistical issues

Opening meeting

- Sets time and date for closing meeting
- Explains how nonconformances are identified and recorded
- Reviews health and safety rules, etc.
- Present overview of reporting mechanisms
- Discusses confidentiality
- Ansers questions and seeks support

Gathering audit evidence

- Information, records or statements of fact to determine whether EMS conforms to standards, etc.
- Confirm:
  - Documented procedures exist for activities that affect the environment
  - Procedures are implemented
  - Adequate records are being consistently kept
  - Personnel that may impact the environment have been properly trained

Evidence

- Evidence gathered through:
  - Interviews
  - Examination of documents
  - Observations
- Interview between 7-10 employees
- Ask the right questions
- Personnel should be identified before the audit is started

Interviews

- Target the right individuals by organizational chart
- Do not limit questions to managers
- Take good notes and put them in writing
- Positive first impression
- Ask open ended questions
- What if?, Suppose
- Listen

Interviewing, part 2

- Explain the purpose up front
- Reassure the interviewee
- Stress the positive benefits of the audit
- Never speak negatively or with sarcasm

Interviewing Questions

- What is your job title?
- Describe your responsibilities and what you do
- What is your company's environmental policy?
- What does the policy mean to you and how does it affect your job?
- What training have your received?
- Where are the procedures that affect you?
- What kind of daily records do you keep?

Auditor

- Auditors should be
  - Attentive
  - Patient
  - Pay close attention to responses
- Concentrate on what the interviewee is saying
- Keep good eye contact
- Do not judge
- Give one last chance to add information
- Must acquire corroborate from records, observations and other evidence

Document Review

- Review a sample of EMS documents
- Confirm location of documents
- Document verification
  - Documents exist and are being followed
  - Aspects identified for the area
  - Legal and other requirements identified for the area
  - Objectives and targets established for the area
  - EMP exists

Documents

- Documents address changing operations
- Organizational chart exists
- Training records
- Proof of communication with stakeholders and interested parties
- Key EMS documents are current and identified
- Obsolete documents have been reviewed
- Emergency preparedness is in place
- Monitoring and measuring exists

Documents, contd.

- Situations requiring corrective actions have been closed out
- Environmental records are legible, identifiable and traceable
- Managements review has occurred
- Look for a liability
- Don't go off on tangents

Walk through

- Watchful eye
- Pay close attention to areas identified as having a significant environmental aspect
- Do not jump to a conclusion
- Observations require further examination
- Observation requires corroboration
- Write down an observation, does not necessarily require corrective action

Common problems encountered

- Apprehensive employees
- Disgruntled employees
- Poor communication
- Language barriers
- Bad timing
- Outside distractions
- Mixed perceptions
- Lack of interest

RAB Code of Ethics

- Auditor shall act:
  - Professionally
  - Accurately
  - Unbiased
  - Strive to increase confidence
  - No conflict of interest
  - No discuss audit information
  - No commission or other benefit
  - No false or misleading information
  - Preface public statements

Nonconformances

Non-conformance – The non-fulfillment of a specific requirement, such as one or more EMS requirements have not been addressed, one or more EMS requirements have not been implemented, or several nonconformities exist that taken together, lead a reasonable auditor to conclude that one or more EMS requirements have not been addressed or implemented.

Nonconformances

- Major
  - Lack of an EMS element or procedure or a non-fulfilled requirement that jeopardizes the EMS or the environment
  - Recurring
  - Multiple minor nonconformances
- Minor
  - Observed lapse of a procedure or EMS requirement
  - Single incidence

Audit observation

- May be included in report or part of working papers
- Not required to take formal corrective actions
- Not corroborated by other evidence

Nonconformance reports

- 1 page report
- Reported to management
- Describe nature of nonconformance
- Locality, department, reference to standard
- Exact observation of facts
- Cite documents
- Signature of manager required

Closing meeting

- Detail nonconformances
- Audit scope and objectives, findings
- Explanation of concern and significance of each
- Led by lead auditor
- Questions are addressed
- Audit disclaimer
- How EMS conforms to audit criteria
- Sets target dates for nonconformances

Audit report

- Summary of audit findings
- Evaluate the adequacy of the EMS
- Identify areas in need of improvement

Report should include

- List those who participated in audit
- Restate scope and objectives, etc.
- Identify departments, areas audited
- Identify documents, EMS manual against which audit was conducted
- Provide a short summary of each nonconformance and observation
- A general summary of the audit and the extent of conformance

Corrective actions

- Eliminate the cause of a nonconformance
- Taken against deficiencies currently present
- Seeks to find root cause of a nonconformance
- Establish corrective actions
- Provide a time frame for completion
- Establish responsible parties

Preventive actions

- Action taken to prevent a nonconformance
- Seeks to identify root causes
- Preemptive preventive action seeks to preclude corrective actions

Follow up actions

- Required to ensure preventive and corrective actions have occurred
- May take the form of an audit

Property transfer assessments

aka: Phase I and Phase II studies

AKA

- Environmental due diligence audit
- Environmental site assessment
- Property transfer assessment
- Environmental baseline assessment
- Preliminary hazardous waste site survey
- Phase I assessment

National Standards

- American Society of Testing and Materials
  - E.1527-00 - Phase I Site Environmental Assessment Process
  - E.1528-00 – Transaction Screening Process
  - E.1903-97 – Phase II Environmental Site Assessment Process
  - E.2018-01 – Baseline Property Condition Assessment Process
  - D.6008-96 –Standard Practice for Conducting Baseline Surveys

Why

- Environmental liability
  - Regulations - CERCLA (Superfund)
  - Contamination
  - Potentially Responsible Party (PRP)
    - May be liable for complete costs, even if contribution is relatively small
  - Brownfields- Restoring a previously contaminated site to new use

Current/Former Owner

- Liability
  - Ability to use innocent landowner defense
  - Type and magnitude of site contamination
  - Number of other PRPs
  - Each PRP's ability to pay for cleanup costs

Typical clean up tasks

- Removing underground storage tanks and cleaning up the site
- Clean up of multiple sites involving multiple hazards
  - Asbestos
  - Lead-based paint
  - Metals
  - Organic chemicals
  - Hazardous wastes
- Soil and groundwater clean ups

Factors affecting clean up

- Ownership
- Type of property transaction
- Extent of contamination
- Costs to address site contamination
- Strategic value of property

Site Assessment

- Systematic procedure to evaluate subject properties for potential environmental contamination and liability. The phases of the process involve varying depths of investigation.

Site Assessment Phases

- Phase I – Initial Investigation
- Phase II – Confirmation sampling and Investigation
- Phase III – Site characterization and remediation

Property transfer activities

- Equipment decontamination
- Equipment decommissioning
- Chemical and hazardous waste removal
- Permit license transfers and terminations
- Site restoration and improvements
- Building demolition

NEPA issues

- Wetland preservation
- Effects of construction
- Local jobs
- Long and short term environmental impacts
- Flood and mud slide hazards
- Endangered species
- Historic properties and archaeological sites

Assessment issues

- Environmental permits
- Personal equipment and materials
- Equipment that needs to be decommissioned
- Condition of the property for its intended use
  - Building inspection

Site operating permits

- Determine if they can be transferred, must be modified and should be terminated based on future use
- Examples
  - NPDES surface discharge
  - Pretreatment
  - Title V air
  - Other air
  - Radioactive
  - Storage tanks

Building inspection

- Conditions of infrastructure
- Condition of structures
- Appropriate for intended use
- Need to rehabilitate property

Due diligence audit

- Identify and document potential environmental issues of a subject property
- Objectives
  - All due diligence requirements are met
  - Potential contamination has been identified
  - Establishing a consistent defensible approach
  - Establishing an environmental baseline
  - Avoiding costly remediation

Phase I elements

- Interviews
- Site visit
- Gathering and analyzing information on current and past site uses and activities
- If Phase I uncovers potential liabilities moves to Phase II
- If Phase II confirms contamination, move to Phase III

Phase I

- Phase I – performed to determine whether environmental contamination is likely to be present

Phase I elements

- Prelimnary activities
- Site visit
- Records review
- Regulatory review
- Geologic and hydrogeologic review
- Report preparation and review

Site activities reviewed

- Hazardous substance releases
- Hazardous material and waste handling practices
- Underground and aboveground storage tanks
- Polychlorinated biphenyls
- Pesticides and herbicides
- Sensitive environments
- Historic and cultural resources
- Asbestos, radon, lead and indoor air quality
- Topographic and natural resources
- Water and wastewater
- Air pollution control

Preliminary activities

- Logistics for site visit
- Obtaining basic site information
- Contacting site personnel to set up visit
  - Site visit time and date
  - Scope and purpose
  - Resolve escort and health and safety issues

Phone interviews

- Potential persons to interview
  - Property owner
  - Adjacent property owners
  - State and local authorities
- Use site questionnaire
- Document name and other relevant information about interviewees

Preparing for site visit

- Review site maps
  - Location and size of property
  - Current property owners
  - Contact information
  - Number and location of buildings and structures
  - Number and location of aboveground and underground storage tanks
  - Current site activities

Site visit

- Essential element of Phase I
- Allows assessors to make first hand observations
- Visual survey of the property and neighboring properties
- Interview
- Review of documentation

Visual survey

- Look for visible signs of environmental contamination
- Walk around property boundary
- Walk around neighboring sites
- Inspect current operations
- Note sensitive environmental areas

Records review

- Site operating data
- Permit and compliance information
- Site history information
- Other communications

Environmental records

- Zoning
- Permits, past and present
- Hazardous releases
- Hazardous/solid waste disposal practices and sites
- Hazardous waste and material handling and storage practices
- Other waste handling practices
- Undergound/aboveground tanks

Observations

- Obvious signs of current and potential contamination and spills
  - Stained soil
  - Decayed vegetations
  - Leaking drums
  - Discolored water
  - Air emissions

Safety issues

- Confined spaces
- Opening drums of known or unknown hazardous materials
- Entering hazardous areas
- Trenches
- Pits 5 feet or deeper

Inspections

- Account for all hazardous materials and wastes on the site
- Inspect laboratories for chemicals
  - Old
  - Unlabeled
  - Highly reactive
  - Lab packs
- Petroleum products
  - Fire/explosion hazardous
  - Leaking and potential groundwater and soil contamination

PCB's

- Transformers
- Capacitors
- Light ballasts
- Hydraulic and heat transfer fluids
- Regulated under TSCA
- Labeling and management
- Document PCB-containing equipment should eb labeled

Pesticides

- Includes
  - Herbicides
  - Rodenticides
  - Fungicides
- Chlorinated hydrocarbons
- Highly toxic
- Bioaccumulate
- Use and management regulated under FIFRA

Sensitive areas

- Wetlands
- Coastal zones
- Parks and recreational areas
- Areas with endangered species
  - Flora
  - Fauna
- Historic and cultural areas
- Identify surface waters, pits, ponds, etc.

Asbestos

- Not used since 1987
- Found in
  - Floor tiles
  - Roofing
  - Pipe insulation
  - Other insulating materials
- Should have a survey of asbestos containing materials

Lead

- Lead-based paints
- Lead pipes
- Lead solder
- Routes of entry
  - Inhalation
  - Ingestion

Other materials

- Radon
- Radioactive materials
- Indoor air quality

Facility records

- Clues to present and past activities
- Documents provide an environmental history and insight into current and past practices of site
- Satellite accumulation records
- SPCC plans
- Pollution prevention plans
- Contingency and other emergency response plans
- Risk management plans

Other records

- Manifests
- Spill and release records
- Operating records
- Communication records

Questions to ask

- Is the property located in an are designated as a wetland, wilderness or historical area?
- Are any lakes, springs, rivers, ponds located near or on the property?
- What are the zoning requirements or intended future uses of the property or adjacent properties?

Questions, page 2

- Is the owner aware of any underground storage tanks or other contamination sources on the property or adjacent properties?
- Is or has the subject property or propertied within 2 miles been listed on the NPL?
- Have there been any fuel leaks in the area?

Questions, page 3

- Has the facility possessed any environmental permits in the present or past?
- Has the facility been cited for any permit violations?
- Have soil and/or groundwater studies been conducted on the site or adjacent sites?

Question, page 4

- Doe the local fire department have any records of problems?
- Has an indoor air quality study been conducted recently?
- Has all USTs been located?
- Have aerial photos been taken before the current operation began?
- Have asbestos, lead-based paint or radon surveys been recently conducted?

Questions, page 5

- Have RCRA or CERCLA investigations been conducted?
- Are any industrial drums handled?
- What other industrial activities have occurred on the site?
- Are hazardous substances disposed of on site or discharged to pits, ponds or drains?
- Are there ponds or collection pits on site?

Questions, page 6

- Are there signs of stressed vegetation or stained soil?
- Are any leaks present on the site?
- What hazardous materials have been used on site?
- Have there been on site or off site releases?
- Are there any drinking water or monitoring wells on site?

Questions, page 7

- Are there any abandoned wells or septic tanks?
- Are there any ASTs or USTs?
- Is there staining around any tanks?
- Does any AST have secondary containment?
- Are PCB or asbestos-containing materials properly labeled and managed?

Questions, page 8

- Is there evidence of a PCB or asbestos release?
- When was each building constructed?
- Is there a wastewater treatment facility on site?
- What treatment systems are in place?

Records search

- Obtained during site visit
- Obtained from regulatory files
- Obtained from other files

Types of records

- Title documents
- Aerial photos
- Incident reports
- Permit records

Sources

- Title search or real estate office
- County deed records
- Current and past owners/operators
- Sanborn fire and insurance maps
- Engineering and architecture offices
- State and local DOT highway rights of way and construction
- Private companies providing information for a fee
- Flood plain maps

Sources, page 2

- Local libraries
- State and local regulatory offices
- CERCLA and RCRA records
- Facility records
- County soil reports
- County zoning and planning records
- Local wastewater facilities
- Construction blueprints
- USGS, USDA, etc.

Past uses

- Tax records
- Aerial photos
  - Back 50 years
  - Use professional to review
- Title records
- Sanborn fire maps
- State highway drawings
- Past owners

Regulatory review

- Permit history
- Compliance history
- Various environmental databases
- Neighboring properties within 1 mile
- Typical agencies
  - Environmental
  - Fire
  - Public Health
  - Soil conservation
  - Zoning and planning

Geology/hydrogeology

- Direction of groundwater flow
- Depth to groundwater
- Nearby surface waters
- Site topography
- Water quality
- Soil characteristics and types
- Well surveys
- Drinking water studies
- Obtain copies of studies of the site or nearby sites and other regional studies

Report

- Document the results of the liability assessment
- Document the findings
- Document the conclusions
- Provide recommendations
- Document
  - Site visit
  - Record review
  - Regulatory review
  - Geology/hydrogeology summary

Report, page 2

- Conclusions
  - Possibilities and nature of environmental contamination
  - Potential for liability
- Recommendations
  - Based on intended use of the property
  - Liability of the site
  - Limitations clearly stated
    - Missing data and reports
    - Lack of cooperation

Reports, page 3

- Provide back up documentation
  - Inspection notes
  - Property related reports
  - Completed questionnaires
  - Regulatory correspondence
  - Site maps

Reports, page 4

- Reviewed for correctness and completeness
- Technical reviewer
  - Evaluates assessor's due diligence
  - Statements correctly derived and supported
  - Reviewer must be qualified
- Legal review may be required

Reports, page 5

- May proceed after the results with purchase
- May modify purchase
- May need to conduct a Phase II

Report outline

- Introduction
- Site location and description
- Site ownership and past and current uses
- Site inspection results
- Regulatory review
- Adjacent properties
- Hazardous materials and waste management
- Sensitive environmental areas
- Supplemental studies
- Conclusions and recommendations

Report appendices

- Site maps
- Site photographs
- Site ownership records
- Regulatory records
- Aerial photos
- Chemical lists and MSDSs
- Groundwater data
- Soil boring data

Phase II

- Performed when Phase I identifies potential areas of contamination
- Verify whether a specific environmental issue exists or a release has occurred
  - Limited site sampling
    - Soil
    - Air
    - Surface water
    - Groundwater
    - Structures

Extent based on transaction type

- Disposal of property - must characterize all contamination
- Acquisitions - potential of the acquisition must outweigh the costs of further investigations

Considerations

- Use of a consultant is essential
- Expensive
- Time consuming
- Must monitor work to control costs, etc.
- Must understand what the results mean

Typical tasks

- Soil samples
- Soil borings
- Groundwater samples
- Surface water samples
- Air quality samples
- Asbestos samples
- Lead-based paint
- Radon air samples

Phase II elements

- Review the findings of the Phase I report
- Develop a sampling confirmation and analysis plan
- Perform sample collection and analysis
- Evaluate the results against environmental standards
- Develop the Phase II report

Prior to Phase II

- Review Phase I report
- Discusses what is currently known about the site
- Evaluate
  - Background information
  - Findings
  - Conclusions
  - Recommendations

Background from Phase I

- Recommended locations of investigation
- Types of contamination and sources
- Prior site use and practices
- Physical characteristics of the site
- Geologic/hydrogeologic considerations

Sampling and analysis plan (SAP)

- Field sampling plan (FSP)
  - Sampling activities
  - Scope of the analysis
  - Health and safety plan (HSP)
- Quality Assurance Project Plan (QAPP)
  - Identifies quality assurance and quality control procedures used in the field sampling and the analyses

SAP

- Sampling results should be
  - Conducted by independent labs
  - Defensible
  - Accurate

FSP

- Field sampling analysis procedures
- Safety and health plan
- Project management plan

FSP, page 2

- Covers
  - Sampling objectives
  - Site background
  - Site characteristics
  - Potential contaminants of concern
  - Type of media being sampled
  - Sample type and location
  - Number and frequency of samples
  - Sample numbering and identification
  - Field QA/QC

HSP

- Must meet OSHA29 CFR 1910 regulations
- Roles and responsibilities of site personnel
- Site specific hazards
- Safety precautions
- Regional medical locations

Sampling objectives

- Clearly delineated
- Dictate
  - Sampling sites
  - Sampling methodology
  - Types and number of samples
  - Proper sample containers
  - Sample preservation techniques

Types of samples

- Composite – composed of one or more sample taken over time or location and mixed
- Grab – discrete sample collected once

QA samples

- Split samples
- Duplicate samples
- Blank samples
- Spiked samples

QAPP elements

- Project management
- Measurement and data acquisition
- Assessment and oversight
- Data validation and usability

Phase II report

- Summary of Phase I findings
- Results of the confirmation sampling and analysis
- Discussion of potential risks to human health and the environment
- Discussion of potential remedial alternatives
- Recommendations to end investigations or move to Phase III

Report Outline

- Introduction
- Site map and plans
- Likely sources of contamination
- Soil sampling and analysis
  - Sampling QA/QC overview
  - Sampling methods and procedures
  - Analytical methods
  - Results

Outline, page 2

- Groundwater sampling and analysis
  - Sampling QA/QC overview
  - Sampling methods and procedures
  - Analytical methods
  - Results
- Conclusions and recommendations

Phase III

- Comprehensive study to fully the character and nature of contamination on a property and any affected populations or environmental receptors
- Only after Phase II confirms contamination
- Extremely rare except in the case of Brownfields

Phase III elements

- Plan development
- Site characterization
- Risk assessment
- Establish clean up goals
- Remedial technology recommendations
- Cost estimation of remediation
- Report preparation and review

Phase III activities

- Review and evaluate Phase II report
- Develop SAP
  - Objectives
    - Determine extent and severity of contamination
    - Develop a clean up strategy
    - Increase scope and extent of sampling
    - Higher resolution of samples required

Site activities

- Rigorous sampling and analyses required
- Use results to determine risk

Risk assessment

- Appropriate risk based clean up levels
- Requires
  - Swift source characterization
  - Exposure assessment
  - Dose response evaluation
  - Risk characterization
- Uses CERCLA requirements
- Can be qualitative or quantitative

Future land use options

- Industrial/commercial
  - Least conservative
- Recreational
- Agricultural
- Residential
  - Most conservative

Remedial alternatives

- Screened against evaluation criteria
- Most representative selected
  - Overall protection of human health and the environment
  - Compliance with appropriate and relevant alternative requirements (ARARs)
  - Long term effectiveness and permanence
  - Reduction of toxicity, mobility or volume

Alternatives, contd.

- Short term effectiveness
- Ease of implementation
- Costs
- Regulatory and community acceptance

Feasibility options

- No action
  - Natural attenuation
- Institutional controls
  - Deed restrictions
  - Perpetual ownership
- Technological solutions
  - Remediation
  - Demolition
  - Decontamination
- Combinations

Phase III report

- Nature and extent of contamination
- Comparison to goals, background levels, etc.
- Activities performed
- Risk assessment results
- Clean up goals
- Remedial alternatives
- Recommendations