

Revision to DOE Order 450.1 [1] and How it affects DOE Sites – 9003

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ABSTRACT

On June 4, 2008, DOE finalized the latest technical revision of DOE Order 450.1A [2]. The latest revision of the order contains many new EMS requirements that can have a dramatic effect on what and how activities are conducted at the various DOE sites. The latest revision of the order contains many new Environmental Management System (EMS) requirements that can have a dramatic effect on what and how activities are conducted at the various DOE sites.

DOE Order 450.1 [1] contains some major technical revisions that will directly affect each DOE site. The exact extent of the changes to the order will vary at each site depending on the status of EMS implementation utilizing the ISO 14001:2004 [3] (2004 denotes the latest version in effect) Standard and Executive Order 13423 [4]. ISO 14001:2004 [3] contains a total of 17 elements (i.e., requirements) that are required for EMS programs. Because the original DOE Order 450.1 [1] did not require conformance to the original ISO 14001:1996 [5] Standard, this is a significant addition to EMS program management.

Some EMS program elements will require effort, some significant, depending upon the complexity of the operations conducted at the various DOE sites. Significant EMS elements added include audit programs (e.g., internal and external), operational controls (e.g., procedures, personnel and equipment), monitoring and measurement (e.g., key environmental metrics tracking and equipment calibration), document controls, communication and preventive actions.

DOE has also drastically altered its approach to sustainable development and environmental stewardship by specifying departmental goals through:

- Reduction or elimination of the toxicity of waste through pollution prevention;
- Reduction or elimination of the acquisition, use and release of toxic/hazardous materials and chemicals;
- Maximizing the purchase of environmental friendly chemicals and materials in the conduct of operations;
- Reduction or elimination of environmental impacts from electronic assets and
- Reduction and depletion of environmental resources through post-consumer recycling.

The purpose of this technical paper is to identify the technical changes specified in the latest DOE Order 450.1 [1] revision and provide generic guidance of implementation strategies at DOE sites.

INTRODUCTION

On January 15, 2003, the U. S. Department of Energy (DOE) approved the first version of *DOE Order 450.1 [1], Environmental Protection Program* that mandated development and implementation of an environmental management system (EMS) at each site under the purview of DOE. Although the International Standards Organization (ISO) had developed and implemented an EMS Standard (14001:1996 [5]) that became effective in 1996, DOE decided to only require sites to implement environmental policy, planning, environmental compliance and management review requirements. These requirements were based upon the original ISO 14001:1996 [5] Standard that was later revised in 2004 to

ISO 14001:2004 [3] version of the Standard. The ultimate purpose of the ISO Standard is to demonstrate compliance with all applicable regulations while focusing on pollution prevention and continual EMS improvement.

On June 4, 2008, DOE issued the latest technical revision of DOE Order 450.1A [2]. The latest revision of the order contains many new EMS requirements that can have a dramatic effect on what and how activities are conducted at the various DOE sites.

THE LATEST ORDER REQUIREMENTS

DOE Order 450.1A [2] contains some major technical revisions that will directly affect each DOE site. At the time of this technical paper, there is no DOE implementation plan or guidance to assist sites and contractors in the change to this Order [2] which requires compliance for the new order revision by June 2009. The exact extent of the changes to the order will vary at each site depending on the status of EMS implementation utilizing the ISO 14001:2004 Standard [3] (2004 denotes the latest version in effect) and Executive Order (EO) 13423 [4]. The most significant change is contained in Section 4.b(1) which states:

“Correspond to the environmental management system elements and framework found in the ISO 14001:2004 [3] (E) International Standard or its successor when approved by DOE, including policies, procedures and training to identify operations and activities with significant environmental impacts; to manage, control, and mitigate the impacts of these operations and activities; and to assess performance, implement corrective actions where needed, and ensure continual improvement.”

ISO 14001:2004 [3] contains a total of 17 elements (i.e., requirements) that are required for EMS programs. Because the original DOE Order 450.1 [1] did not require conformance to the original ISO 14001 Standard [5], this is a significant addition to EMS program management. Table I provides a crosswalk of the original DOE Order requirements that DOE sites that are not ISO 14001:1996 [3] registered are currently following and the ISO 14001:2004 [3] requirements that will need to be implemented at each DOE site. The original version of DOE Order 450.1 [1] did not require the ISO 14001 Standard to be fully implemented, only selected elements. Table II provides a brief listing of the DOE sites that currently registered to the ISO 14001:2004 Standard. It is important to note that the ISO 14001:2004 Standard [3] elements contain some prescriptive requirements per element and it is strongly recommended that site EMS Management Representatives carefully read and understand the ISO Standard elements. Due to the varying missions and complexity of activities performed at the various DOE sites, implementation of the revised DOE Order 450.1 [1] requirements can drastically vary in complexity, scope and resources required to ensure efficient and effective EMS program implementation.

Table I. Previous vs. Revised DOE Order 450.1A [2]/ISO 14001 [3] Requirements

14001:2004 [3] Element	Functional Area	Previous DOE 450.1 Order^a Requirement	Revised DOE 450.1A Order^b Requirement
4.2	Environmental Policy	X	X
4.3.1	Environmental Aspects	X	X
4.3.2	Legal and Other Requirements		X
4.3.3	Objectives, Targets and Programs	X	X
4.4.1	Resources, Roles, Responsibility and Authority		X
4.4.2	Competence, Training and Awareness		X

4.4.3	Communication		X
4.4.4	Documentation		X
4.4.5	Control of Documents		X
4.4.6	Operational Controls		X
4.4.7	Emergency Preparedness and Response		X
4.5.1	Monitoring and Measurement		X
4.5.2	Evaluation of Compliance		X
4.5.3	Nonconformity, Corrective Action and Preventive Action		X
4.5.4	Control of Records		X
4.5.5	Internal Audit		X
4.6	Management Review	X	X

^aSee Ref. 1.

^bSee Ref. 2.

As denoted in Table I, there are several additional elements of an EMS that were not required by the previous version of the order.

Table II. DOE Sites Currently Registered to the ISO 14001:2004 Standard[3]

Site/Organization	Location
Brookhaven National Laboratory	Brookhaven, NY
Oak Ridge National Laboratory	Oak Ridge, TN
Oak Ridge Associated Universities	Oak Ridge, TN
EnergX, LLC	Oak Ridge, TN
Wackenhut Security Incorporated	Aiken, SC

It should be noted that many of the newly required requirements are most likely addressed by other DOE Program site documentation (e.g., nonconformity, corrective action, emergency preparedness, environmental policy, etc.) that may need modification to fully conform to the ISO 14001:2004 [3] element framework as defined in the Standard. In addition, current elements (e.g., aspects, management review, etc.) that were covered by the previous version of the Order will also need to be reviewed to ensure conformance with ISO 14001:2004 [3] requirements. DOE sites or activities that are ISO 14001 [3] registered via a third party registrar should require little change as their EMS is required to conform to the Standard elements at the time of issuance of the revision to DOE Order 450.1A [2]. Sites that are 14001:2004 [3] registered should focus efforts on implementing EO 13423 [4] as discussed later in this paper. Section 5.d.(7) [2] of the Order states that sites that are registered will only require DOE field oversight verification that the registration and associated audits address the scope of the activities covered under the respective EMS.

SIGNIFICANT EMS PROGRAM ADDITIONS

Several of the EMS program elements will require effort, some significant, depending upon the complexity of the operations conducted at the various DOE sites. These elements include audits (e.g., internal and external), operational controls, monitoring and measurement, document controls, communication and preventive actions. Each major element addition is discussed below.

Audits (Internal and External)

DOE Order 450.1A [1] provides the following citations pertaining to internal and external audit programs:

Section 1.a(4)(c) states: “An environmental compliance audit and review program that identifies compliance deficiencies and root causes of non-compliance.”

Section 1.c(1)(a) states: “The environmental management system must be validated according to the following criteria. An environmental management system shall be considered fully implemented when—the environmental management system has been the subject of a formal audit by a qualified party outside the control or scope of the environmental management system.”

Section 1.(c)(3) states: “(3) To remain fully implemented, at least every three years (a) the environmental management system must be audited by a qualified party outside the control or scope of the organization implementing the environmental management system, and (b) the conformance declaration 1c(1)(c) is renewed, as appropriate.”

This is a significant addition to the current DOE EMS program. ISO 14001:2004 [3] requires that an internal audit program exist for EMS activities and that these audits are planned. In addition, it requires that impartiality be maintained by those that conduct these audits. Essentially, personnel directly responsible for EMS activities and operations being audited cannot conduct, plan, or participate in internal EMS audits. Internal audits must be planned and cover all 17 elements of the ISO 14001:2004 [3] Standard. This is accomplished through an internal EMS audit plan. Internal audits must be scheduled and all 17 elements must be audited at least once every three years. Groups of elements may be assessed in separate, regularly scheduled audits or all 17 elements may be assessed in a single three-year audit, at the discretion of the DOE Site Management.

Internal Audit results must also be documented for each of the elements. The results should contain an overall assessment of conformance with requirements and provide written detail as to the documentation, interviews and activities assessed to justify conformance.

Formal internal environmental compliance audits are also now required in the revision to the order. The exact wording in the revision to the order is found in Section 4.b(4)(c) and is stated as follows: “(c) Procedures for implementation of an environmental compliance audit and review program that identifies compliance deficiencies and possible root causes of non-compliance. (d) Procedures for integration of compliance management system information and resource allocation procedures to ensure that audit findings and possible root causes of non-compliance are tracked and addressed.” Basically, this means that DOE sites must develop and implement environmental compliance audit procedures, conduct the audits, track the noncompliances and apply a root-cause analysis to identify underlying issues and prevent recurrence.

Validation (external) audits are also required after the DOE site has declared successful DOE Order 450.1A [2] implementation and additionally every three years to maintain EMS program validation. These audits also must be conducted by a qualified party outside of the control or scope of the EMS.

Because the revised DOE Order 450.1A [2] requires a qualified party to conduct validation audits, qualified lead auditors that have completed an Registrar Accreditation Board Quality Society of Australasia (RABQSA) ISO 14001:2004 [3] Lead Auditor Training Course and are familiar with DOE operations should be utilized for these audits. The same qualifications and training are also required for lead auditors that conduct internal EMS audits.

Operational Controls

ISO 14001:2004 [3] requires that operational controls be in place for significant aspects identified by the organization. A significant aspect is defined as an element of an organization's activities, products, or services that can interact with the environment and could result in a significant impact if not managed properly. Operational controls are typically management plans, procedures, trained personnel and proper equipment. If, in rare instances, an operational control cannot be identified for a significant aspect, written justification detailing why controls cannot be instituted should be developed and made available for internal and validation EMS audits. The most effective way to determine if operational controls exist is to perform a gap analysis using the organization's significant aspects and detailing what plans, procedures, personnel and equipment exists for each aspect. Significant aspects that do not possess operational controls will need these controls developed and implemented. This can also be a significant effort given the complexity and scope of DOE site activities or significant environmental issues exist.

One of the most misunderstood requirements of the ISO 14001:2004 [3] standard is contained in the operational controls element and is stated as follows: "establishing, implementing and maintaining a documented procedure(s) to control situations where their absence could lead to deviation from the environmental policy, objectives and targets." Although confusing, this statement translates to "stop work" in the DOE Complex. While this concept is fundamental throughout DOE plans and procedures and personnel have a firm grasp of this concept, relating this statement to the site EMS is sometimes a difficult transition. Initially the statement must be documented in the DOE site EMS documentation and properly flowed to the site personnel through the various training programs.

Monitoring and Measurement

While most DOE sites closely track key metrics related to their respective site activities, EMS metrics are not always captured. ISO 14001:2004 [3] requires that each organization track key EMS metrics. These metrics should be tied directly to the objectives, targets and management plans associated with the environmental aspects, in particular, significant aspects. Both versions of DOE Order 450.1 [1, 2] (original and revised) requires targets and objectives to be measurable and achievable. The word measurable is directly applicable to metrics, therefore, established objectives, targets and management plans produce measurable results that must be tracked as a "key metric" in order to conform to the ISO 14001:2004 [3] element requirements.

Another important addition to DOE EMS requirements revolve around monitoring activities and those associated with significant aspects. This typically involves environmental monitoring equipment such as flow meters, automatic samples, stack monitors, laboratory fume hoods, tank gauges (e.g., temperature, pressure, depth), etc. Environmental equipment associated with significant aspects should be inventoried, calibrated and maintained to ensure that monitoring results are accurate and reliable.

It is recommended that this process begin with a review of the site compliance permits and identifying the monitoring equipment associated with these compliance activities. Significant aspects that do not have permit requirements should then be assessed for any monitoring equipment. After the monitoring equipment inventory list has been completed, calibration and maintenance records for each of these items should be collected and maintained as a formal EMS record. It is imperative that all key monitoring equipment be properly calibrated and maintained, failure to assure such activities have occurred on a regular basis will most likely result in an EMS nonconformance and possible environmental noncompliance, if required by the respective site permit.

Document Control

Most, if not all DOE sites have rigorous document control systems that should easily align with most ISO 14001:2004 [3] requirements. One document control requirement that may need to be included in DOE Site procedures includes the management of obsolete documentation.

ISO 14001:2004 [3] requires document control procedures provide detail to prevent the unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose. This function is typically performed in conjunction with the site records retention matrix; however, the true intent of this requirement is to ensure that documentation, including plans and procedures noted as operational controls are maintained as the “current” version within work areas at DOE sites. This becomes more problematic as the geographic size of the site, the number of employees at a site increase and field management of documentation is not properly maintained at work locations or within site databases. If obsolete document control at the various DOE sites does not adequately address the ISO 14001:2004 [3] requirement, it must be added to document control procedures and it is highly recommended that work area inspections be incorporated into regular conduct of operations reviews to ensure procedural versions maintain specified EMS conformance.

Communications

Due to security reasons, many DOE sites do not freely share information about site operations, in particular, with regards to EMS performance. While it is encouraged, ISO 14001:2004 [3] does not mandate sharing of information with outside parties. EMS communications must occur, at a minimum, within the confines of the respective DOE site boundaries. All on-site personnel, whether or not they are federal employees, prime contractors, subcontractors and tenants must be made aware of the site environmental policy and any significant environmental aspects conducted on-site. This can be communicated through required training, bulletin boards, newsletters, closed-circuit television broadcasts and intra-net web-sites.

External communications also must be addressed regarding EMS operations. External (e.g., regulators, stakeholders, general public) communications should be detailed in written procedures and logged for official response and tracking purposes. In addition, each DOE site must document its decision to share information regarding significant aspects with external entities, whether or not the decision is or is not to share with the public. Finally, any external communications must be included in the management review even if no external communications were received.

Preventive Actions and Root Cause Analysis

Another significant change in the DOE Order pertains to the application of root-cause analysis to EMS nonconformances and environmental noncompliances. All DOE sites perform root-cause analysis using a variety of software tools; however, these analyses are typically utilized for significant Documented Safety Analysis (DSA), Technical Safety Requirements (TSR) or other specialized noncompliances. DOE Order 450.1A [2] requires root-cause analysis for EMS nonconformances and environmental noncompliances. Documented root-cause procedures for DOE sites should be modified to perform these analyses for noted EMS deficiencies.

The documentation and management of EMS preventive actions are required by the ISO 14001:2004 [3] standard. While DOE sites have well-documented corrective action systems, preventive actions are typically misunderstood and widely left out of nonconformance management. Preventive actions are extremely important with regards to ISO 14001:2004 [3] and causal analysis. The main thought being that if preventive actions can be initiated to prevent a future nonconformance or release to the environment, then these actions should receive priority, even over noted corrective actions. The problem exists as to how to identify these actions in order to make a measurable impact upon DOE site EMS operations. Preventive actions are best identified as a result of a mature EMS that utilizes trend analysis to identify deteriorating circumstances or adverse trends in performance. Many DOE sites actually

perform preventive actions but do not take the proper credit because they are not formally documented as such.

Preventive actions can include a regularly-scheduled preventive maintenance programs, inspections of high hazard areas to ensure procedural compliance, specialized personnel training to prevent environmental releases (e.g., waste container sample training, bag-house operator training, HEPA filter change out, etc.), dated equipment replacement with state of the art increased efficiency equipment and placement of physical barriers to prevent releases (e.g., hay bales, silt fences). Preventive actions should be clearly identified, documented and implemented.

Sustainable Environmental Stewardship Goals

DOE has drastically altered its approach to sustainable development and environmental stewardship by specifying departmental goals through:

- Reduction or elimination of the toxicity of waste through pollution prevention (the amounts and toxicity levels are not defined in the Order [2]);
- Reduction or elimination of the acquisition, use and release of toxic/hazardous materials and chemicals;
- Maximizing the purchase of environmental friendly chemicals and materials in the conduct of operations;
- Reduction or elimination of environmental impacts from electronic assets and
- Reduction and depletion of environmental resources through post-consumer recycling.

While most of the DOE sites will have a number of environmental initiatives underway in existing programs that support the above DOE goals, a thorough review of these goals and objectives will need to be evaluated for inclusion in site pollution prevention programs.

Executive Order 13423 - Federal Environmental, Energy, and Transportation Management [4]

Contractor Requirements Document Section 1.b(1) states: “The environmental management system must include the following: (1) Sustainable practices for enhancing environmental, energy, and transportation management performance, as stipulated in Section 3(a) of E.O. 13423 [4].” The EO contains some very aggressive environmental goals for the federal government. Some of these initiatives are captured under the environmental stewardship goals set by DOE and some are not. Those that are not specifically called out in the DOE goals are the greenhouse gas emissions, water and energy consumption, sustainable materials use in major building construction/renovation projects and vehicle fleet management including conversion to hybrid motor vehicles.

Of the federal government goals listed in the EO, the greenhouse gas emissions, water and energy consumption and fleet management are considered to have the highest potential impact on DOE sites. The primary reason for the impact is financial. Funding will be required to update many of the physical building locations to reduce energy and water usage. Examples are high-efficiency insulation installation, motion-sensor light switches, low-water volume toilets, energy efficient windows, etc. Greenhouse gas emissions represent the most potential impact, especially if the various DOE sites have fossil fuel steam plants and boiler systems. The financial impact for major facility upgrades can be substantial.

It is recommended that a greenhouse gas emissions inventory be conducted and calculated for each DOE site that specifically identifies all greenhouse sources and the respective site carbon footprint. Based upon inventory results, a strategic plan should be developed to reduce or eliminate these sources through reduction in operation, equipment upgrade or alternative use initiatives. If it is determined that a major equipment renovation is required for a long-lead item such as a steam plant bag house or boiler system,

these items should be included in DOE site capital facility upgrade baselines as soon as possible for funding authorization. Fleet management is only required for fleets consisting of 20 or more vehicles. While this will not directly affect the smaller DOE sites, it will have a potential dramatic effect on the larger sites. Scheduled, phased fleet replacement activities replacing the most aged vehicles with hybrids can help mitigate the financial cost burden.

OTHER EMS PROGRAM ELEMENTS REQUIRING ATTENTION

While the items listed in this section do not represent significant changes in the DOE Order revision, they do need the appropriate attention to ensure effective order implementation. Failure to properly implement these requirements will result in future internal and external nonconformances against the DOE site EMS.

Environmental Policy

All DOE sites have an environmental policy; however, many of the DOE sites that are not ISO 14001:2004 [3] registered will not be in conformance with the ISO 14001:2004 [3] Standard requirements. Specifically, written commitment references in the policy to the framework for targets and objectives and making the environmental policy available to the public are typically not listed.

Management Review

All DOE sites have some form of management review; however, many of the DOE sites that are not ISO 14001:2004 [3] registered will again, not be in conformance with the ISO Standard. All management review criteria listed in the Standard must be addressed and documented in management reviews. An attendance roster and meeting minutes should also be recorded and managed as formal EMS records.

Resources, Roles, Responsibilities and Authorities

Management and technical roles and responsibilities are required to be clearly documented and understood at DOE sites. The EMS Management Representative may or may not be properly identified in DOE site organizations. Site organizational charts and management plans should be updated to clearly identify and define the EMS Management Representative, as well as reporting responsibilities to line management.

Environmental Planning

Environmental planning activities are the basis for all EMS programs regardless of type (e.g., general industry, government). Each DOE site has performed the appropriate environmental aspects identification, as well as the establishment of targets and objectives to aid in the management of potential risk with those aspects identified as significant. DOE sites must ensure that all significant aspects are clearly identified and have established targets, objectives and management plans on a one-to-one crosswalk. The targets, objectives and management plans should also clearly identify the responsible party, along with specific timeframes and dates for accomplishment. This planning methodology is also consistent with the ISO 14001:2004 [3] Standard. One important note is that DOE sites are somewhat hesitant to list specific dates for certain activities due to budgetary and technical concerns. The ISO Standard allows for these dates to be changed without penalty. Changes are recommended to occur during the requirement review of aspects, targets and objectives for each DOE site.

Records Management

Due to the nature and mission of the various DOE sites, records management systems have been developed and effectively implemented. These systems include records retention matrices for the proper storage time of sensitive records and documents. Records management systems at DOE sites should be updated to include EMS records. The respective DOE site records retention matrix should also include key EMS records to be retained. Examples of EMS records to be retained include management reviews,

aspects and impacts analyses, established targets and objectives, pollution prevention metrics and progress achieved, emergency preparedness drills, internal and external EMS audit reports, as well as others.

DOE ORDER 450.1A [2] IMPLEMENTATION STRATEGIES

As discussed in this technical paper, the revision to DOE Order 450.1A [2] is substantial. Many new EMS elements have been added as well as key environmental and pollution prevention goals listed in the DOE and Executive Orders.

An appropriate path forward for each DOE site is to perform a DOE Order 450.1 [1] and DOE Order 450.1A [2] gap assessment by a qualified individual that is knowledgeable of not only the DOE Order, but also the ISO 14001:2004 [3] Standard. It is highly recommended that the individual performing this assessment have completed an ISO 14001 RABQSA Lead Auditor qualified training course because of the in depth knowledge gained regarding interpretation of the ISO Standard. The gap assessment should crosswalk all ISO 14001:2004 [3] and DOE Order 450.1 [1] requirements against existing DOE site EMS elements to determine existing gaps. An implementation plan should then be developed along with resource loaded schedule to effectively and efficiently fill the identified gaps. Implementation progress should be constantly measured to ensure expeditious implementation. Upon completion of all identified gap items, the first full internal EMS audit should be conducted and any corrective actions identified. It is recommended that the external validation audit should not be performed until the internal EMS audit has been completed. This methodology will greatly accelerate and enhance DOE site EMS implementation and reduce the number of noted nonconformances prior to the required external validation audit and self declaration. It is important to remember that DOE Order 450.1A [2] implementation is required by June 2009. This can be achieved by the process described in this section.

EXECUTIVE ORDER 13423 [4] IMPLEMENTATION STRATEGIES

EO 13423 [4] identifies and requires significant planning and resources to achieve greenhouse gas emissions, energy and water consumption reduction for federal agencies by 2015.

A schedule for implementation and implementation guidance from the federal government has not been provided to federal sites. The EO [4] was signed by President Bush in January 2007 and requires compliance by 2015. All federal sites are expected to begin implementation of measures that will bring their sites into compliance with specified timeframes immediately. Because the performance criteria requires significant goals that most closely resemble the ISO 14001:2004 [3] Planning Element 4.3.3, Targets, Objectives and Programs, it is appropriate to either add the EO requirement to an appropriate existing or create a new target and objective. For example, if greenhouse gas emissions management is not currently reflect in the respective site targets and objectives profile one should be created that reflects all activities that would be required to appropriately manage this objective including those associated with proper identification of baseline inventories.

EO 13423 [4] guidance states that 2003 will serve as the baseline year for the various inventories (e.g., greenhouse gas, energy, water consumption, vehicle fleet management, etc.). Due to the varying missions and existing infrastructure at the various DOE sites, not all of this data will be available. It is highly unlikely that all required data will be immediately available to appropriately calculate the 2003 baseline inventory which will require detailed research of energy meter, water meter, fuel usage, fleet maintenance and boiler/steam plant operation for 2003. This is a critical activity that requires much thought, effort and detail. It is important to note that the better accuracy detailed in the 2003 baseline may result in future cost savings and effort reduction for the various sites to achieve compliance with the specific EO 2015 goals.

Once a 2003 baseline inventory is well known and documented, a 2008 inventory should be assembled using updated data sources. Both 2003 and 2008 data should be assembled in a spreadsheet format such that progress tracking metrics can be established and monitored on a real-time basis. The metrics tracking method referenced is also the same requirement as previously discussed in ISO 14001:2004 [3] Element 4.5.1, Monitoring and Measurement. Long lead and capital upgrade projects (e.g., steam plant bag house replacement, boiler replacement, stack repair/replacement, etc.) should also be identified with the appropriate schedule and responsibility in the targets and objectives listing as well. Under ISO 14001 [3], targets and objectives are required to be kept up to date and if funding for large projects is not obtained, the respective target and objectives listing can be updated to reflect the change without fear of receiving a nonconformance or finding.

EMS AUDIT IMPLEMENTATION STRATEGIES

DOE Order 450.1A [2] requires both an internal and external validation audit at varying intervals in the DOE site operations. Internal audits should be conducted by a qualified, trained ISO 14001:2004 [3] auditor that is familiar with the DOE Order and ISO 14001:2004 [3] standard.

This is especially imperative with the latest DOE Order revision as discussed in this technical paper, there are a number of new technical requirements that may be misinterpreted when applying the standard to DOE site operations. One example involves ISO 14001:2004 [3] Element 4.4.3, Communication which requires an organization to document its decision to communicate its significant aspects information with outside entities. Some auditors may misinterpret this to require DOE to transmit a formal letter to outside parties or regulators sharing management information about critical activities that may have a significant environmental impact from the respective DOE site operations. In reality, the ISO 14001:2004 [3] standard only requires a short statement documenting its decision to either share or not to share information on significant aspects. This can be done easily in the applicable section of site contractors ISMS program description documenting communications protocols.

Internal audits must cover all 17 elements of the ISO 14001:2004 [3] standard and must be planned prior to the audit. This can be done by developing an audit plan and a checklist developed straight from the ISO 14001:2004 [3] standard to ensure each of the ISO elements is adequately covered. All 17 elements are required to be audited in a 3-year period and it is recommended that the various elements be sequenced to reflect the size and scope of the DOE site being audited. Internal EMS audits are required annually and can audit strategies can be by building, location or ISO 14001:2004 [3] element. For example, a DOE site has 2 internal auditors to cover 50 buildings on-site, 5 of which are categorized as high risk.

Using a graded approach, the highest risk facilities would be audited annually for the ISO 14001:2004 [3] element due within that year. The elements being audited in the first EMS internal audit are environmental policy (4.2), aspects and impacts (4.3.1), targets and objectives (4.3.3), evaluation of compliance (4.5.2) and operational controls (4.6). Subsequent audits (e.g., second and third audits) would cover the remaining 12 elements.

Audit reports with associated checklists must be completed and issued as formal EMS documents following any internal EMS audit as evidence that these audits have been conducted. Internal EMS auditors must be appropriately trained to the ISO 14001:2004 [3] standard and be impartial. Internal auditors are prohibited from auditing areas or work that they directly produced or managed. It is highly recommended though, that the first EMS internal audit cover all 17 ISO 14001:2004 [3] elements and be conducted prior to the external validation EMS audit. This will minimize the potential for any undiscovered nonconformances that would be identified during the external EMS validation audit.

External EMS validation audits are required every 3 years and should be conducted by a qualified lead ISO 14001:2004 [3] auditor with the proper credentials (e.g., RABQSA lead auditor certification). External auditors should also be familiar with DOE operations and in particular, DOE Order 450.1A [2] as failure to do so may result in misunderstandings regarding contractual and DOE program requirements.

CONCLUSION

The revision to DOE Order 450.1A [2] is rather substantial and can easily result in implementation issues and problems that have not been previously encountered at the various DOE sites. The protocols and recommendations detailed in this technical paper are intended to help guide DOE and contractor environmental management personnel through this major revision to the DOE Order. Because every DOE site is unique, some implementation strategies identified in this paper may be more or less effective due to a variety of circumstances such as mission, location, environmental factors, funding, staff and site conditions.

QUESTIONS?

Any technical questions can be forwarded to Joe Birchfield at birchfieldj@earthlink.net or by calling (865) 363-0728.

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SPEAKER BIOGRAPHY

Joseph W. Birchfield, III is a RABQSA certified ISO 14001 Environmental Management Systems Lead Auditor with over 19 years of professional experience. He holds a B.S. Degree in Biological Science from East Tennessee State University and a number of advanced professional certifications including EMS-Lead Auditor RABQSA accreditation and Registered Environmental Manager (NREP). He has performed hundreds of audits and assessments for the DOE, DOD and NASA. He has been directly involved in achieving 3rd Party ISO 14001 registration for 6 federal sites that include the DOE EnergX Transuranic Waste Processing Center and Oak Ridge Associated Universities/Oak Ridge Institute for Science Education in Oak Ridge, Tennessee, NASA Marshall Space Flight Center in Huntsville, Alabama, DOD Holston Army Ammunition Plant in Kingsport, Tennessee, DOD Kilgore Flares in Toone, Tennessee and DOD Anniston Army Depot in Anniston, Alabama.

He also developed and implemented the ISO 14001 EMS for the DOE Salt Waste Processing Facility in Aiken, South Carolina. He has served on a number of DOE Headquarters Operational Readiness Reviews involving EMS implementation at the K-25 Gaseous Diffusion Plant Decontamination and Decommissioning Project, ORNL Molten Salt Reactor Experiment and RH and CH-TRU Startup activities at the EnergX Transuranic Waste Processing Center in Oak Ridge, Tennessee. He currently serves DOE Oak Ridge Operations Environmental Management as a Waste Management and Environmental Management Systems Subject Matter Expert. Primary responsibilities involve operational oversight of all DOE Oak Ridge EM prime and subcontractor waste characterization, packaging and disposal operations at all on-site and off-site TSDFs, as well as the Oak Ridge CERCLA Environmental Management Waste Management Facility disposal landfill.