

Office of Independent Oversight  
Office of Security and Safety Performance Assurance  
U. S. Department of Energy

*Independent Oversight  
Status Report*

*Implementation of  
DOE Order 450.1,  
Environmental Protection  
Program*

December 2005



## Table of Contents

EXECUTIVE SUMMARY .....	1
1.0 INTRODUCTION .....	2
2.0 ENVIRONMENTAL MANAGEMENT SYSTEM.....	3
2.1 Positive Attributes.....	3
2.2 Weaknesses .....	4
2.3 Assessment.....	5
3.0 POLLUTION PREVENTION PROGRAMS .....	6
3.1 Positive Attributes.....	6
3.2 Weaknesses .....	7
3.3 Assessment.....	7
4.0 OPPORTUNITIES FOR IMPROVEMENT.....	8

### Abbreviations Used in This Report

ANL	Argonne National Laboratory
DOE	U.S. Department of Energy
EM	DOE Office of Environmental Management
EMS	Environmental Management System
ES&H	Environment, Safety, and Health
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
LANL	Los Alamos National Laboratory
NNSA	National Nuclear Security Administration
OFEE	White House Office of Federal Environmental Executive
P2	Pollution Prevention
PPOA	Pollution Prevention Opportunity Assessment
SC	DOE Office of Science
SNL	Sandia National Laboratories

OVERSIGHT

## Executive Summary

The Office of Independent Oversight, within the Office of Security and Safety Performance Assurance, has responsibility for evaluating safeguards and security; cyber security; environment, safety, and health (ES&H); and emergency management programs across the U.S. Department of Energy (DOE) complex and reporting on their status to the Secretary of Energy, senior DOE management, and Congress. To facilitate improvements across the DOE complex, Independent Oversight selects focus areas—areas that warrant increased attention across the complex—based on a review of operating events and inspection results. Independent Oversight then evaluates those focus areas during its inspection of DOE sites for a period of time, typically one year, and reports on the status of the focus areas based on the results of its evaluations. This report provides the status of one of Independent Oversight’s selected focus areas for 2005, specifically, the site efforts to establish environmental management systems (EMSs) and implement pollution prevention (P2) programs.

DOE Order 450.1, *Environmental Protection Program*, requires that DOE sites implement sound environmental stewardship practices and, through these practices, meet or exceed compliance with applicable environmental, public health, and resource protection laws using an EMS that is part of the existing integrated safety management system. This order also requires Independent Oversight to evaluate the effectiveness of DOE Headquarters and field organizations in implementing its requirements. During calendar year 2005, Independent Oversight evaluated the effectiveness of the implementation of this order specifically for EMS and P2 during five ES&H inspections: the Pantex Plant, Sandia National Laboratories, Argonne National Laboratory, the Y-12 National Security Complex, and Los Alamos National Laboratory. The results of the five ES&H inspections conducted by Independent Oversight provide a “snapshot” of each site’s progress in meeting the DOE Order 450.1 requirement for an implemented EMS by December 31, 2005.

At all five sites, Independent Oversight determined that ongoing initiatives developed by the site contractors, often in conjunction with DOE site offices, were proceeding at a pace that would meet the DOE Order 450.1 requirement for an implemented EMS by December 31, 2005. As follow-up, Independent Oversight confirmed that all five sites reported implementing their EMS by the milestone date. These initiatives and the resultant EMSs are having a positive effect on protecting resources and ensuring compliance with environmental requirements, and a number of sites have implemented noteworthy practices that help achieve an EMS or meet P2 goals.

Generally, the five sites’ P2 programs have been implemented, although availability of resources varies. P2 requirements have been communicated actively and effectively through various mechanisms. Dedicated personnel support sitewide program activities and assist line organizations in identifying opportunities to reduce or eliminate waste. As a result, these sites have received a number of awards and recognition for P2. Although some sites have obtained P2 funding through their line organizations or the Generator Set-Aside Fee, the elimination of DOE’s central funding incentive for P2 activities has impacted the P2 program. Some sites have determined that line funding priorities would not support implementing some P2 projects, even though those projects would help meet DOE P2 goals, reduce waste generation, and ultimately help meet DOE Order 450.1 and Executive Order 13148 requirements.

Independent Oversight will continue to evaluate safety management programs and select focus areas based on a review of operating events and inspection results where weaknesses continue to be identified or when new requirements are being implemented. Independent Oversight also will continue to periodically review its evaluation results and report the status in an effort to facilitate improvements. By these means, Independent Oversight will continue to fulfill its mission of promoting improvement in DOE ES&H programs.

This report summarizes the observations and insights from evaluating the effectiveness of implementing select requirements of U.S. Department of Energy (DOE) Order 450.1 during Office of Independent Oversight environment, safety, and health (ES&H) management inspections conducted in 2005. Independent Oversight chose as a particular focus area the effectiveness of DOE Headquarters and field organizations in implementing DOE Order 450.1, which requires each site to establish an environmental management system (EMS) as part of its existing integrated safety management system (ISMS). This focus area was chosen because of the pending requirement for EMS implementation by December 31, 2005, and because past inspections and other performance data (including the Quarterly EMS Implementation Status Reports) indicated that several sites may not reach the implementation goal by this due date. In 2005, this focus area was evaluated as part of ES&H inspections at the five sites listed in Table 1. The table also identifies the DOE program office that has primary management responsibility for each site: the National Nuclear Security Administration (NNSA) or the Office of Science (SC).

Section 2 of this report discusses Independent Oversight's observations about sites' effectiveness in implementing selected aspects of DOE Order 450.1. Section 3 discusses Independent Oversight's observations about sites' P2 performance. For the two areas that were reviewed, Independent Oversight discusses positive attributes and weaknesses and provides an overall assessment. Section 4 presents potential opportunities for improving DOE performance across the complex.

Site-specific deficiencies and opportunities for improvement have already been communicated to the sites as part of Independent Oversight's inspection reports and are not presented here. Instead, the improvement items in this report focus on potential enhancements of DOE performance across the complex. However, where appropriate, this report does refer to positive attributes at specific sites so that interested parties can obtain additional information about innovative approaches and noteworthy practices (e.g., by referring to the applicable ES&H inspection report or by contacting the site).

**Table 1. EMS Inspection Sites**

<b>SAFETY MANAGEMENT INSPECTION SITE</b>	<b>HEADQUARTERS PROGRAM OFFICE</b>
Pantex Plant	NNSA
Sandia National Laboratories (SNL)	NNSA
Argonne National Laboratory (ANL)	SC
Y-12 National Security Complex	NNSA
Los Alamos National Laboratory (LANL)	NNSA

DOE Order 450.1 establishes DOE requirements to comply with Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, which requires Federal agencies to implement an EMS at all appropriate facilities by December 31, 2005. In order to track progress, Federal agencies must submit an annual report to the White House Office of Federal Environmental Executive (OFEE). The OFEE has identified several key metrics that DOE has adopted; DOE sites use these metrics in reporting their progress quarterly.

Although not specifically required by DOE Order 450.1, DOE sites have the option of basing their EMS on the International Organization for Standardization (ISO) 14001 EMS standard. To build environmental considerations into the existing management framework, DOE Order 450.1 requires that the site EMS be integrated into the already implemented ISMS. Independent Oversight evaluated the integration of the ISMS and EMS at each of the five sites. Independent Oversight also examined the sites' EMS programs with respect to implementation guidance provided by DOE (DOE Guide 450.1-1), including the ISO 14001 standard if adopted by the site. The evaluations also addressed the sites' progress in achieving the metrics identified by the OFEE and adopted by DOE.

The review to determine the effectiveness of the implementation of DOE Order 450.1 focused on actions taken and pending initiatives for establishing an EMS. Key considerations in this determination were: 1) the level of the involvement of senior managers and establishment of an environmental policy that reaches beyond compliance to a proactive environmental program; 2) the involvement by line organizations in addition to the environmental compliance/support organization; 3) the status of EMS documents and how effectively EMS has been integrated within the site's existing ISMS; 4) the extent of the objectives and targets, including a risk ranking and buy-in by line organizations; 5) the plans and support documents for communicating the rollout of the EMS; and 6) the activities or plans for the

site to confirm implementation and the site office to verify that the EMS has been implemented. Because 2005 was the final year in a multiyear process to develop and implement an EMS at each site, the results of this review reflect different stages of implementation. For example, while the first site was reviewed almost a full year before the established implementation date of December 31, 2005, the last site was reviewed only a few months before that date. Therefore, in evaluating site progress, Independent Oversight considered the site's status at the time of the oversight review and the time remaining until the implementation date. As part of this report, Independent Oversight confirmed that all five sites reported meeting the December 31, 2005, implementation date. In 2006, Independent Oversight will continue to evaluate the ultimate effectiveness of the implemented EMS at DOE sites.

### 2.1 Positive Attributes

Independent Oversight reviews indicate a number of positive attributes in the areas of senior management support, clear expectations, effective tools, and effective use of resources.

**DOE site offices provide clear expectations, set performance measures, and oversee EMS establishment activities.** The site offices use a number of incentives for EMS implementation, including contractor performance measures in the award fee, and have issued letters that define expectations for an EMS. DOE personnel have also been actively engaged in monitoring progress by attending contractor EMS establishment and implementation meetings and reviewing contractor EMS documents and self-assessments of EMS implementation activities. The site offices either have or were making plans to verify that the contractor has established an EMS once the contractor makes the self-declaration.

**Sites have obtained senior management commitment and support for EMS.** Several sites have had excellent involvement by either the site manager or the deputy manager and by senior DOE managers at the site. In these cases,



it has been clear to line managers and workers that implementing the EMS is a high priority, helping to ensure that the necessary resources were available and activities were undertaken. This has had the added benefit of line managers' viewing the institutional EMS personnel as a valuable resource to help them achieve a senior management goal, rather than as internal auditors trying to force compliance with a DOE order requirement.

**Several sites have established effective programs for implementing an EMS.** For example, at Pantex, the Site Office Manager and the Plant Manager were very active in EMS implementation, and the plant's Public Affairs and Document Control Managers were on the EMS implementation team. The EMS was to be one of the initial programs/systems that went on line as part of the plant's new electronic, interactive documentation system for ES&H. At other sites, line organizations' ES&H Coordinators worked in conjunction with dedicated teams staffed from the environmental support organization to tailor objectives and targets to their line missions and processes. At all sites, actions were taken to integrate the EMS within the existing ISMS. In addition, at LANL, action was taken to obtain third-party certification of the EMS under ISO 14001.

**Sites plan to share resources for verification of EMS implementation.** The contractor must certify and the site office must verify that the EMS has been implemented. Some DOE field elements and contractor sites have coordinated their efforts to better use their limited environmental staff expertise. For example, Pantex has arranged with the Kansas City Plant, also an NNSA site, to use Federal and contractor environmental personnel to perform an independent certification and verification of the Pantex EMS. Within SC, sharing of resources among sites supported by the Chicago Office was also considered. Using personnel from one site to verify another site improves the exchange of ideas for EMS and also avoids the expense of purchasing the services of a third party.

**Sites have developed effective tools for assisting in the implementation of EMS.** Several sites have developed manuals and other implementation documents that line organizations can use in achieving an effective EMS. Sites have also developed internal websites to provide EMS information, briefing packages, and tracking information on implementation of key elements of the EMS within line organizations. One noteworthy practice is the Los Alamos National Laboratory Environmental Management System Toolkit, a communication tool

that provides presentations on the EMS and the documents that implement it. This toolkit defines how the site's EMS teams are established within the various line organizations in order to develop programs and define objectives and targets for their organizations.

## 2.2 Weaknesses

Independent Oversight inspections did not identify any weaknesses that would prevent timely EMS implementation at the sites reviewed; however, a few weaknesses were identified in documentation and implementation strategies at lower tiers of site organizations.

**Line management at the division and facility level has not always demonstrated ownership for their portion of the EMS.** An important aspect of EMS is the daily performance of all personnel who could impact the environment. While senior management support was evident, ensuring good performance requires buy-in by line managers at all levels of the organization, as well as objectives and targets that are tailored for the missions and processes used by the line organizations at the facility level. Several sites developed the EMS within the environmental support organization and therefore focused on actions that could be controlled and managed at that level. For example, at one site, the objectives and targets were for sitewide monitoring and compliance reporting performed by the site's environmental compliance organization. At this site, the line organizations did not have objectives and targets even though their processes generate waste and create emissions. This approach is contrary to one of the key reasons for requiring that the EMS be implemented within the existing ISMS—the premise that the line management is responsible and accountable for the environment, as well as worker safety and health.

**Several site documents that would support EMS establishment have been developed but not issued.** At two sites, documents that would assist in establishing the EMS remained in draft at the time of the Independent Oversight review. At one of these sites, the EMS document was being reviewed and was expected to be released by the site before the end of the year. At the other site, the ISMS description document had been revised to incorporate EMS, but the revised document had not been issued; the EMS description document was used until the revised ISMS document was released. Although these documents were not critical to establishing the EMS, timely issuance

reinforces management commitment to EMS and to the personnel who put forth the effort to develop them.

## 2.3 Assessment

This focus area review showed that all five sites, at the time of their inspection, could be expected to have implemented an EMS by December 31, 2005. Overall, working within the framework of the site ISMS, each site had developed an EMS that was moving, or had already moved, the environmental protection program beyond the support organizations (e.g., environmental compliance and/or waste management organizations) into line missions and activities. In many cases the lead organization, although mostly staffed with site environmental support personnel, also included personnel from the line and other support organizations, such as public affairs. The documentation for the EMS was built (or planned to be built) within the site ISMS, combining both ISMS and ISO 14001 concepts. However, the need to strengthen the documentation for EMS was identified at several sites, including implementation of an electronic, interactive EMS/ISMS database and conversion of an EMS implementation plan into an EMS/ISMS program document.

Supervisors and managers at both the site offices and the site contractors have been involved, either as active proponents or supporters, by signing implementing documents for EMS. At the Pantex Plant, there has been excellent senior management support. Other sites have had good management support, ranging from signing key documents to clearly setting expectations for senior managers during regular management meetings. Thus, line managers and their organizations have supported the EMS to varying degrees during implementation efforts. Within environmental compliance organizations, support for EMS has been high at all five sites.

The five sites have developed objectives and goals, but there is a need to ensure that these go beyond just actions by the environmental support organizations. To meet this need, various processes have been used at the sites, including having the environmental support organizations develop objectives and goals specific to environmental support functions (e.g., sitewide environmental monitoring and reporting), using environmental staff to work with a line manager to develop objectives and goals for that line organization,

and forming teams using environmental and line staff members to develop line objectives and goals. In this latter approach, the teams developed not only the objectives and goals, but also the line infrastructure for achieving them.

Sites either use the public affairs office for communicating the EMS rollout or have developed a communication package within the environmental support organization. By using the site's public affairs office, the EMS program is not only expanded beyond the environmental support organizations but also brings in expertise to ensure that the message is communicated effectively to all site personnel who could have an impact on the environment. In addition, several sites use outreach programs to inform the surrounding public and interested stakeholders about the proactive action being taken to implement an EMS. At Pantex, this outreach included seeking certification of the plant's EMS by the Texas Commission on Environmental Quality under the Clean Texas program.

The site offices that were reviewed at the beginning of the year planned to conduct validation/verification using either site personnel outside the environmental organization or offsite personnel from other sites or a regional support center, such as the Albuquerque Service Center. Using personnel from other sites provides the immediate benefit of having an independent validation, and also promotes sharing of information about weaknesses and good practices across sites. For the sites that planned to use in-house verifiers, the Independent Oversight inspection report suggests an opportunity for improvement to ensure that these personnel can conduct a truly independent review.

Overall, all five sites inspected by Independent Oversight were on schedule to establish an EMS by December 31, 2005. In addition, all sites had developed the EMS within the ISMS framework, and two sites also sought external certification of their EMS. DOE and contractor senior management support has been good, and involvement by the senior managers has been extensive and proactive at some sites. Sites have developed effective tools and taken actions to use resources effectively and share information. As the EMS is implemented, additional attention is needed to ensure that line organizations are sufficiently involved and that documentation is reviewed and approved in a timely manner.

Executive Order 13148, *Greening the Government Through Leadership in Environmental Management*, was issued in 2000 to ensure that Federal agencies integrate environmental accountability into daily decision-making and planning in all their activities through the development and implementation of the EMS and the P2 program. The Executive order complemented and reinforced the P2 goals and environmental stewardship objectives that DOE developed in 1999, and reaffirmed ISMS implementation at DOE facilities pursuant to DOE Policy 450.4, *Safety Management System Policy*, dated October 15, 1996. As part of the EMS, the P2 program has an implementation date of December 31, 2005. Independent Oversight evaluated P2 programs against DOE Order 450.1 requirements and examined the ongoing and proposed improvements in sites' P2 programs.

### 3.1 Positive Attributes

Several aspects of P2 programs at DOE sites are innovative and effective, including communication tools and integration of P2 provisions into projects at several sites.

**DOE facilities have effectively communicated EMS and P2 goals and requirements through training and various communication techniques.**

As part of the implementation strategy, DOE sites have used a variety of communication methods (such as websites, newsletters, flyers, postings, a P2 committee, training courses, and P2 awards) and have dedicated environmental personnel to interface with line divisions to increase the awareness of environmental policy and P2 requirements.

**DOE sites have utilized the Pollution Prevention Opportunity Assessment (PPOA) process to identify and implement beneficial P2 projects to meet DOE P2 goals and reduce waste generation.** PPOA is an excellent tool for evaluating and comparing various P2 opportunities so that sites can prioritize and fund

the most beneficial P2 projects for implementation. Sites use this process effectively, including in work performed by subcontractors, to identify opportunities to meet DOE P2 goals, reduce waste generation, and save operational costs. The P2 opportunities that have been implemented include waste and excess material reuse/recycling, "green purchasing," and other such innovative techniques.

**Some sites have sought line or special funding for P2 project implementation.** Funding responsibility for P2 programs was transferred from the Office of Environmental Management (EM) to the respective line organizations several years ago. Until then, waste management and disposal funds provided by EM included set-aside funds for P2, and DOE sites usually had dedicated P2 staff and a P2 committee that met regularly to coordinate, implement, and manage the P2 program requirements. After the waste management funding transition, each site had to seek P2 funds within existing site resources. In order to implement identified beneficial P2 projects, some sites have sought line funds (e.g., SNL and Y-12) or used the Generator Set-Aside Fee (e.g., LANL). By these means, many P2 projects have been implemented at these sites and have resulted in cost savings, waste reduction, and potentially reduced environmental impacts.

**Several sites have built aggressive P2 activities into construction and demolition projects, including noteworthy practices for excess construction material reuse/recycling.**

The noteworthy practices at SNL include a construction specification to mandate the recycling of unused or excess construction materials and a Construction/Demolition Recycling Center for small construction projects. These resulted in NNSA P2 "Best in Class" awards for Sandia's first Green Building. At this and other sites, demolition projects are evaluated to determine ways to recycle construction and building material, such as used carpeting, and to recover scrap metals in order to either reduce project costs or fund additional P2 activities.



## 3.2 Weaknesses

**The support for P2 programs at some sites has degraded, and some beneficial projects have not been implemented.** Since the P2 funding transition from EM to line organizations and the resultant lack of a central funding mechanism for P2 projects, site line management organizations have become responsible for seeking the funds required to implement their P2 programs. With constrained funding, the site P2 support staff has often been reduced or eliminated, P2 committee meetings have become irregular, and the support for PPOA has been reduced, or beneficial P2 projects have not been chosen for implementation. P2 funding has often become the limiting factor in implementation, and only the sites with innovative funding schemes or senior management dedication to their P2 programs have been able to provide the funding needed to implement P2 projects.

**Some facilities have not developed adequate instructions for the PPOA program, and P2 staff do not always review P2 opportunities during project planning.** At some sites, the instructions for executing the PPOA program have not been issued as needed. Also, sites need to ensure that line P2 staff participate in P2 opportunity evaluations during project planning and permitting so that P2 opportunities, including “green” design concepts, can be evaluated and incorporated early in project development.

## 3.3 Assessment

The five sites that were reviewed generally had very good P2 programs in place. P2 activities were included as part of the EMS, and P2 program requirements have been communicated actively and effectively through various mechanisms, enhancing program awareness. Dedicated personnel support sitewide program activities and assist line organizations in identifying opportunities to reduce or eliminate waste. As a result of their P2 efforts, all these sites have received numerous awards, including the White House Closing the Circle Award (e.g., SNL, and ANL-E), and DOE P2 awards (e.g., Pantex, Y-12, and LANL). All sites have assigned personnel to promote P2 actions and support planning for incorporating processes and procedures to reduce the generation of waste. In addition, contractual specifications for construction material/waste recycling and the use of a Construction/Demolition Recycling Center for small construction projects are noteworthy practices that may be applicable throughout DOE.

Although some sites have obtained P2 funding through line management or the Generator Set-Aside Fee, the elimination of DOE’s central funding incentive for P2 activities has impacted the P2 program. Some sites have determined that line funding priorities would not support implementing some P2 projects, even when the PPOA process determined that those projects would help meet DOE P2 goals, reduce waste generation, and ultimately meet DOE Order 450.1 and Executive Order 13148 requirements.

So far, Independent Oversight's review of this area has focused on actions and initiatives for establishing the EMS. As Independent Oversight continues to review the implementation of DOE Order 450.1, the focus in 2006 will be on sites' efforts to identify and prioritize significant aspects of environmental operations and set measurable regulatory and environmental goals, objectives, and targets within the line organizations. In addition, DOE program offices and sites should consider the following opportunities for improvement.

- 1. Ensure that line management accepts ownership for their portion of the EMS and that division and facility-level managers have clear goals and actions.**
- 2. Strengthen the documentation for EMS, including implementation of an electronic, interactive EMS/ISMS database and conversion of an EMS implementation plan into an EMS/ISMS program document.**
- 3. Evaluate site-specific mechanisms for prioritizing and funding P2 projects. Line management needs to consider innovative funding schemes (e.g., "taxes" on projects) to provide dedicated funding for P2 projects.**