OFFICE OF CONTRACT ASSURANCE
LAWRENCE BERKELEY NATIONAL LABORATORY

Internal Audit

Of The

LBNL Performance-Based Environmental Management System

July 2005

Executive Summary

The Lawrence Berkeley National Laboratory (LBNL) Performance-Based Environmental Management System (EMS) was developed during 2003 and fully implemented during 2004. The EMS Core Team Leader was designated in late 2002, and the EMS Core Team was formed in 2003. The annual cycle of listing environmental aspects and identifying significant impacts began in February 2004. The process of developing environmental management programs (EMPs) began in May 2004. The program has been very successful in the initial implementation of these activities. Almost all of these activities were performed to the satisfaction of the EMS Plan and the corresponding procedures. A few oversights and an unclear procedural requirement led to five total findings.

The findings in conflict with the LBNL EMS Plan and associated procedures are:

- Core Team meetings lacked a representative from the Procurement Department from May 2004 until June 2005.
- Rationale for determining significance of environmental impacts was not sufficiently documented.
- EMPs were not developed for two of the environmental impacts deemed significant by the EMS Core Team.
- One of the Management Review participants did not receive the required training.
- Significant aspects/ impacts identified during the 2004 EMS cycle did not receive a Management Review prior to the Core Team developing objectives, targets, and EMPs.

The EMS Program experienced several successes through the implementation of seven EMPs. For example, the Procurement Department expanded purchasing requirements that were communicated to the entire department. Another example is that LBNL is pursuing a return-on-investment opportunity that will minimize low-level radioactive waste generation and reduce waste disposal costs by up to $10,000 per year. Finally, LBNL has committed to meeting the minimum requirements of the Leadership in Energy and Environmental Design (LEED) "Certified" standard, which will result in design and construction of energy-efficient buildings. Other EMPs are on schedule to achieve similar success.

Introduction

LBNL has developed a Performance-Based EMS to satisfy the requirements of DOE Order 450.1, Environmental Protection Program. The LBNL EMS model is a systematic approach to ensure that environmental stewardship activities are well managed and provide sound business value. This order also established that the EMS must be integrated with the existing Integrated Safety Management (ISM) system.

The LBNL Performance-Based EMS Plan requires an annual internal audit of the LBNL environmental management system. Ron Pauer, the EMS Core Team Leader, charged

the Office of Contract Assurance (formerly the Office of Assessment and Assurance) with performing the audit. The internal audit evaluated the implementation of the EMS against the requirements of the LBNL Performance-Based EMS Plan and supporting procedures. This included establishing an active EMS Core Team, training appropriate staff, performing an environmental aspects review, and creating EMPs.

The Management Review and EMS Core Team will use the results of the internal audit to prepare for a third party audit of LBNL's EMS. The third party audit will validate if the EMS activities conform to the requirements of the EMS Plan and if it has been properly implemented and maintained.

The audit included interviews with senior LBNL managers who are members of the EMS Management Review, the EMS Core Team Leader, and EMS Core Team Members. Gregory Haet, UC Berkeley Associate Director of Environmental Protection, and Susan Sakaki of EnviroSystems Group were consulted as part of this audit.

Description of the Audit

The audit commenced on Monday, July 18, 2005 and concluded on Monday, July 25, 2005. John Chernowski of the Office of Contract Assurance performed the audit.

Individuals interviewed were:

- David McGraw, Associate Laboratory Director
- George Reyes, Facilities Division Director
- Phyllis Pei, Environment, Health & Safety Division Director
- Ron Pauer, EMS Core Team Leader
- Li-Yang Chang, EMS Core Team Member
- Michael Dong, EMS Core Team Member
- Richard McClure, EMS Core Team Member
- Jeffrey Chung, ISM leader

Documents and records reviewed were:

- LBNL Performance-Based EMS Plan
- EHS Procedure 271, Establishing the EMS Implementation Team
- EHS Procedure 272, Identification of Significant Environmental Aspects and Impacts
- EHS Procedure 273, Environmental Management Programs
- EHS Procedure 274, Training
- EHS Procedure 275, EMS Assessments and Audits
- EHS Procedure 276, Management Review
- EMS Training program
- EMS Training records
- Core Team meeting minutes
- Aspects worksheets

- EMPs and related documents
- Management review meeting minutes
- EMS Gap and Strategic Analysis for LBNL, September 2002

Audit Findings

The detailed audit results are presented in the framework of the LBNL Performance-Based EMS Plan. Therefore, results are presented under the headings:

- EMS program
- EMS implementation team
- Identification of significant aspects and impacts
- Environmental management programs
- Training
- EMS assessments and audits
- Management review

Audit results are categorized either as findings, observations, or noteworthy practices. Findings are deficiencies in conflict with the LBNL EMS Plan and associated procedures (EHS Procedures 271-276). Observations are conditions that may lead to conflict with these program documents and also recommendations that may benefit the EMS program. Noteworthy practices are exemplary work activities or policies.

EMS Program

LBNL continues to integrate EMS with the existing ISM system. Recent proposed additions to the institutional ISM Plan will strengthen this relationship, including expanding the seven guiding principles of ISM to incorporate EMS features. In addition, the Environmental Protection chapter of the LBNL Health and Safety Manual (PUB-3000, Chapter 11) was revised to include an Environmental Management System section.

LBNL has developed an EMS website that includes the EMS Plan, the seven EMPs developed during the 2004-2005 EMS cycle, and an EMS fact sheet. This website is accessible to all LBNL staff and the general public. The public can provide EMS feedback through the EHS Suggestion Box.

Observation:
The EMS Plan requires that "EMS will be integrated into ISMS (Integrated Safety Management System)." Some EMS elements were included in the May 2004 revision of the LBNL ISM Plan. In February 2005, the EMS Core Team Leader submitted more extensive modifications for incorporating EMS into the LBNL ISM Plan. However, these revisions are still not approved by EH&S Division management. Therefore, the LBNL ISM Plan published on the web does not integrate the extensive EMS details proposed by the Core Team Leader.

Observation:
The EMS program would benefit from greater staff and management engagement. The process presently has no mechanism to incorporate the collective wisdom of scientific division staff. Creating a role for the Safety Review Committee or the Division Safety Coordinator Committee would increase the visibility of the EMS program and expand opportunities for Lab staff not on the Core Team to participate in the process.

Noteworthy Practice:
The EMS Plan states "ISM processes will be used to support environmental performance improvement." As a result of EMS Core Team efforts, the ES&H (Environment, Safety & Health) Self-Assessment process has incorporated EMS elements. The Division ES&H Self-Assessment Performance Metrics and the protocol for Integrated Functional Appraisals were both modified to incorporate environmental management elements. The Core Team should continue these efforts and expand the scope of the Safety Review Committee Management of ES&H (MESH) reviews to address environmental management.

Noteworthy Practice:
The EH&S section of the employee institutional requirements has been revised to incorporate environmental protection and preventing adverse environmental impact. Each LBNL employee signs this form annually as a condition of employment.

EMS Implementation Team

The EMS Core Team, led by the Environmental Services Group Leader, designed, implemented, and maintains the EMS Plan. The team meets on a regular basis, approximately monthly when the program was initiated, and approximately quarterly thereafter. Meetings are used to train Core Team members, identify significant aspects and impacts, and discuss implementation of the EMPs.

Finding:
EHS Procedure 271 (Establishing the EMS Implementation Team) requires that the Core Team will include a member from Procurement. However, the Core Team meetings in July 2004, October 2004, January 2005, and April 2005 did not include a member from Procurement. No Procurement representative participated in Core Team meetings between May 2004 and June 2005.

Observation:
The Core Team would benefit by formalizing roles and responsibilities in the employees' position descriptions. In addition, each Core Team member should have a designated backup. Alternate members can add perspective to the primary members environmental aspect and impact evaluation and assist in design and implementation of the EMPs. These recommendations may help in ensuring that fundamental Core Team functions, such as attending regular meetings, are not neglected.

Identification of Significant Aspects and Impacts

The EMS team has begun the second annual cycle of identifying significant environmental aspects and impacts. These aspects involve waste generation and recycling, emissions and discharge, materials and resources use, and land and building development and use. The review process is documented in worksheets and aspects are characterized by the requisite factors, including amounts/ size, health risk, limits, and goals. Aspects are then scored according to a prescribed list of categories.

Finding:
EHS Procedure 272 (Identification of Significant Environmental Aspects and Impacts) requires that the "rationale for determining significant impacts will be documented in the meeting minutes." However, the meeting minutes do not contain this documented rationale. The minutes do include the significance scoring of each aspect in all of the required categories, but this does not provide sufficient rationale, as the team did not simply select those aspects that scored highest for significance.

Observation:
EHS Procedure 272 requires that the "results of the most recent environmental aspect/ impact identification are…reviewed as part of the annual management review process" to determine "if there is a need to consider other factors in performing the environmental impact evaluation." The aspects and impacts identified in early 2004 were reviewed in the June 2005 Management Review meeting. A lag time of over a year does not allow management to properly determine if other factors should be considered in the environmental impact evaluation.

Observation:
The Core Team has not scored each environmental aspect according to all required categories (e.g. severity of impact, duration of impact, etc.) during the 2005 environmental impact evaluation process. However, the Core Team Leader has stated that the 2005 evaluation process is not complete and that all aspects will be scored as required.

Environmental Management Programs

EMPs are used as a formal planning tool and include information regarding tasks, responsibilities, timing, affected department, monitoring requirements, and metrics. The EMPs list objectives and targets established for each significant aspect.

Finding:
Section 6.1 of EHS Procedure 273 (Environmental Management Programs) requires that an EMP will be developed for each significant environmental aspect. However, EMPs were not finalized for two significant aspects identified in Core Team meetings.

Water use was identified as a significant environmental impact during the February and April 2004 Core Team meetings. A draft EMP was prepared and presented at the May 2004 Core Team meeting. The May 2004 meeting minutes also state that the team "may need to rethink need for a water conservation EMP." Consequently, water use was not formalized in an EMP. However, no final determination was documented and no rationale was presented as to why an EMP was not fully developed for this significant aspect.

Hazardous waste was also identified as a significant aspect during the February and April 2004 Core Team meetings. However, an EMP was not developed for this significant aspect and no rationale for this decision was documented.

Observation:
EHS Procedure 273 requires the EMP Lead Person to meet periodically with the EMS Core Team to review EMP progress, accomplishments, noncomformances, and implementation problems. EMP-04-05C, which involves increasing procurement of Energy Star products and products made with recycled paper, was discussed in draft form at the May 2004 meeting. However, the EMP Lead Person did not report on EMP-04-05C progress to the EMS Core Team until June 2005. In fact, this EMP was revised twice without the EMP Lead Person reporting to the EMS Core Team. The internal audit notes that the lack of reporting did not adversely impact implementation and completion of actions required in the EMP.

Noteworthy Practice:
At the request of the Procurement Department, a consultant working with LBNL to implement the performance-based EMS program presented information about the EMS program at a Procurement Department all-hands meeting in June 2005. This presentation also communicated initiatives required in EMP-04-05C that impact Procurement.

Noteworthy Practice:
EMP Leads regularly engage their management in design and implementation of the EMPs. This has served to enhance the effective implementation of actions required in the EMPs and is likely a significant reason that none of the EMPs from the 2004 cycle experienced noncomformances.

Noteworthy Practice:
A potential return-on-investment opportunity identified in EMP-04-02A (low-level radioactive waste reduction) was submitted to the LBNL institutional fund allocation process. This EMP involves the purchase of two filmless Kodak Imagers for Life Sciences Division to reduce low-level radioactive waste generation and related disposal costs.

Noteworthy Practice:
As a result of EMP-04-06C (demonstrate leadership in energy and environmentally sustainable design), the Facilities Division has modified the Project Design Requirements to ensure that all future building projects meet minimum LEED "Certified" standard.

This is a University of California requirement for all state funded buildings that LBNL will voluntarily apply.

EMS Assessments and Audits

The internal auditor has attended EMS implementation training and ES&H auditor training. The internal audit included document review and interviews with key personnel. The opening and closing meetings were held, respectively, on July 18 and July 25 with the Core Team Leader. An observer from the DOE Berkeley Site Office attended most of the interview sessions.

Training

All Core Team members have attended comprehensive EMS training addressing EMS awareness, environmental aspects and impacts, determination of significance, and preparation of EMPs. The Core Team Leader has attended an EMS implementation training course presented by an external party. Most of the Management Review has received EMS awareness training.

Finding:
The EMS Plan identifies the "Business Operations Director" as a participant in the Management Review. The Plan requires that participants in this review receive EMS awareness training. While "Business Operations Director" is no longer applicable, no one of similar capacity has received the requisite EMS training.

Noteworthy Practice:
All Core Team members have received comprehensive EMS training. This was challenging because of significant turnover in Core Team membership. To address this, the Core Team leader held multiple makeup training sessions to ensure that all Core Team members were properly trained.

Management Review

The Management Review includes the appropriate participants, including staff with broad organizational responsibility and decision making authority. An annual Management Review was conducted in June 2005.

Finding:
Section 3.6 (Management Review) of the EMS Plan lists review and approval of "candidate projects for the significant aspects/ impacts" as a key function of the Management Review. Section 3.6 also states "once senior management approves the plan and candidate projects, the Core Team will set new objectives, targets, and EMPs for the coming year." However, the significant aspects/ impacts identified during the 2004

EMS cycle did not receive a Management Review prior to the Core Team setting new objectives, targets, and EMPs.

Observation:
The EMS Plan requires that the "Business Operations Director" will participate in the Management Review. However, no one in this capacity has participated in this review and no make up session has been held with this position to fulfill the functions of the Management Review.

Observation:
Members of the Management Review have expressed that they would like greater management involvement in the EMS program. A couple of examples of this desire are that senior management in the Facilities Division would like a more active role and the program needs a stronger relationship with the Office of the Chief Financial Officer.