



STEVEN CHU  
DIRECTOR

March 30, 2007

Aundra Richards, Manager  
U.S. Department of Energy  
Berkeley Site Office

**Subject: Corrective Action Plan for ISMS for LBNL**

Dear Ms. Richards:

I am pleased to submit the attached Corrective Action Plan (CAP) for the Integrated Safety Management System (ISMS) of the Lawrence Berkeley National Laboratory (LBNL). This CAP is developed based on the recommendations made by an independent review team assembled by the McCallum-Turner, Inc. This team was composed of consultants and experts from other national laboratories and was charged with the goal of conducting a comprehensive review of the implementation of ISMS at the Laboratory (heretofore referred to as ISM Review). The team made an on-site visit September 17-27, 2006 and produced an Evaluation Report in November of 2006.

This Corrective Action Plan reflects our staff's concerted effort in analyzing the recommendations of the ISM Review as well as the findings, the root cause analysis, and the resulting corrective actions from the Peer Review conducted in January, 2006. The corrective actions in this plan are designed to improve overall ES&H performance by addressing the organizational and cultural issues as well as the implementation issues raised by both reviews. The synergistic correlation between the two reviews is documented in Appendix B which cross references the Peer Review corrective actions and the ISM Review Corrective Actions. The full Evaluation Report is available at:

<http://www.lbl.gov/ehs/ism/external-audit/assets/doc/Evaluation-of-ISM-at-LBNL-McT-Final-Report.pdf>

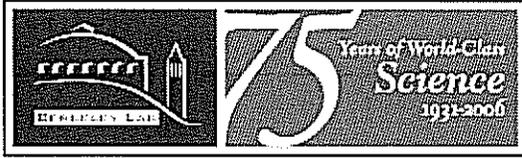
We appreciate your ongoing support in improving the implementation of ISM at the Berkeley Lab.

Sincerely,

Steven Chu, Director

Attachment

Cc: Vice President, Robert Foley, UC  
Associate Vice President, Roibert Van Ness, UC  
Deputy Director, Graham Fleming  
Chief Operating Officer, David McGraw  
Division Directors



# Berkeley Lab

## Integrated Safety Management System (ISMS) Evaluation

### Corrective Action Plan

March 30, 2007

A handwritten signature in black ink, appearing to read 'H. Hatayama', written over a horizontal line.

Howard Hatayama  
EH&S Division Director, LBNL

A handwritten signature in black ink, appearing to read 'D. McGraw', written over a horizontal line. To the right of the signature is the date '3.30.2007'.

David McGraw  
Chief Operating Officer, LBNL

A handwritten signature in black ink, appearing to read 'S. Chu', written over a horizontal line.

Dr. Steven Chu  
Director, LBNL

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**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

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**LIST OF ACRONYMS**

AHA	Activity Hazards Analysis
AHD	Activity Hazards Document
ALS	Advanced Light Source Division
BSO	Berkeley Site Office
CAP	Corrective Action Plan
CATS	Corrective Action Tracking System
CIP	Continuous Improvement Plan
COO	Chief Operating Officer
DART	Days Away from Work, Restricted Time or Transfer from Job
DOE	U.S. Department of Energy
DSC	Division Safety Committee
EH&S	Environment, Health, and Safety Division
ES&H	Environment, Safety, and Health
HEAR	Hazard, Equipment, Authorization, and Review
HEERA	Higher Education Employer-Employee Relations Act
IFA	Integrated Functions Appraisals
IMP	Issues Management Program
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazards Analysis
JHQ	Job Hazards Questionnaire
LBNL	Lawrence Berkeley National Laboratory
MAXIMO	Enterprise Operations and Asset Management System
MESH	Management of Environment, Safety, and Health
M-T	McCallum-Turner
OAP	Operating and Assurance Plan
OCA	Office of Contract Assurance
OIA	Office of Institutional Assurance
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
PEMP	Performance Evaluation Management Plan
PR	Peer Review
PRD	Performance Review Document
PD&C	Planning Design & Construction
RPM	Regulations and Procedures Manual
RWP	Radiological Work Permits
RWT	Radiological Worker Training
S/A	Self-Assessment
SAD	Safety Analysis Document
SC	DOE Office of Science
SME	Subject Matter Expert
SPA	Safety Performance Assessment
SPACS	Standards, Policies and/or Administrative Controls

## **Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

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SRC	Safety Review Committee
TRC	Total Reportable Case
UCB	University of California, Berkeley
UCOP	University of California, Office of the President
USI	Unreviewed Safety Issues
WOW	Workers Observing Workers
WRC	Work Request Center
WSS	Work Smart Standards

## **Integrated Safety Management System (ISMS) Evaluation**

### **Corrective Action Plan**

#### **I. INTRODUCTION**

##### **A. Background/History**

On January 5, 2006, the University of California commissioned a peer review of the implementation of Integrated Safety Management at the Lawrence Berkeley National Laboratory (LBNL, Berkeley Lab). This review was undertaken by laboratory management because the Lab did not achieve all of its 2005 safety metrics, including those for TRC and DART. In addition, a number of near misses were considered leading indicators of less than adequate safety performance. In response to the findings of the peer review, Berkeley Lab also initiated an internal review of seven technical reports documenting safety weaknesses in a wide variety of areas and activities. Common themes emerged from the analysis of the internal and peer review results. A detailed corrective action plan, referred to here as the Peer Review Corrective Action Plan (PR CAP), was developed to respond to the findings of both reviews. Many improvements have been achieved since the implementation of the PR CAP (e.g., defined line management terms in PUB 3000, revised Safety Review Committee Charter, developed and implemented Safety Coordinator qualifications and training, enhanced Self-Assessment (S/A) Process). In July of 2006, a Department of Energy (DOE) validation review of LBNL's PR CAP recommended a more comprehensive review of the implementation of LBNL's Integrated Safety Management System (ISMS). The objective of the ISMS Evaluation review was to determine the performance of a cross section of the Laboratory with respect to the Core Functions and associated Guiding Principles of ISM.

This comprehensive review was conducted September 17-27, 2006. The final report entitled "Evaluation of Integrated Safety Management at LBNL" (ISM Evaluation Report) was issued in November, 2006. The review met expectations, as evidenced by detailed evaluations of Laboratory activities and operations at bench level, within large scale user facilities, and in maintenance activities. Critical institutional processes and performance in ES&H technical areas were also evaluated. This review resulted in a set of seven prioritized recommendations, reinforced by more specific details and specific guidance for improvement (See List of Recommendations in Appendix A). These recommendations were structured to reflect actions that would have strategic impact on the ISMS at LBNL.

Careful analysis of the detailed findings in the ISM Evaluation Report reveals that there is significant overlap between these findings and the results of the root cause analysis of the PR findings. Further, a gap analysis between the PR root causes and the causal factors underlying the seven Recommendations of the ISM Evaluation

Report reveals that the ISM Evaluation Report encompasses all of the PR root causes. Accordingly, the PR root causes essentially substantiate the Recommendations in the ISM Evaluation Report. The confluence between the causal factors from the ISM Evaluation Report and the PR root causes is demonstrated in Appendix B.

All the PR corrective actions are accounted for in this ISM CAP (see Appendix C). Some of these corrective actions for the PR root causes have been completed, as shown in the Appendix C table, and are now considered to be part of the institutional program. The close relationship between the PR root causes and ISM Evaluation Report causal factors provides the basis for concluding that the PR root causes are an integral part of the ISM CAP and, as such, are listed in this ISM Evaluation Report CAP.

### **B. Objectives of the CAP**

The overall objective of this CAP is to improve implementation of ISM at LBNL in the key areas identified by the ISM Evaluation Report in order to sustain excellent safety performance while accomplishing the Laboratory's research and education mission.

### **C. Approach Used to Develop the Corrective Action Plan**

In light of the confluence of the causal factors from the ISM Evaluation Report and the root causes from the Peer Review and considering the strategic nature of the actions recommended by the report, LBNL accepted all seven actions as the foundation of this CAP. To the extent that these actions fall into the following four focus areas, LBNL established separate teams and lead persons for each of these areas:

1. Improving mechanisms for assuring safety line management accountability and responsibility based on institutional and individual performance expectations (Corrective Actions (CA) 1 & 2)
2. Enhancing feedback and improvement mechanisms including issues management, self-assessment and alignment of ES&H goals and objectives (Corrective Actions (CA) 3,4 &5)
3. Institutionalization of more comprehensive and robust hazards analysis, work planning and work authorization processes by safety line managers, work leads and workers (Corrective Action (CA) 6)
4. Developing mechanisms for on-going assurance of the safety of LBNL funded work at UCB (Corrective Action (CA) 7)

Each team lead (1) solicited input from key stakeholders and appropriate subject matter specialists (SMEs), (2) analyzed the detailed findings, and (3) reconciled this information with that from the PR. This process led to identification of major

activities that support each of the seven corrective actions, as listed in the CAP. It was essential to ensure that there was consistency across the suite of major activities being developed. Accordingly, the team leads met at least weekly with the Project Leader to ensure that proposed activities did not conflict and appropriately supported the implementation of the corrective actions.

**D. How the Work Team Was Organized to Address the Issues**

*CAP Project Team Leader:* Howard Hatayama, EH&S Division Director.  
*Line Management (CA 1 & 2) CAP:* Jack Bartley, former Deputy Director of EH& S and current Chair of the LBNL Animal Welfare and Research Committee.  
*Feedback and Improvement (CA. 3,4 & 5) CAP:* John Chernowski, Manager, Office of Contract Assurance.  
*Work Planning (CA 6) CAP:* John Seabury, EH&S, Industrial Hygiene.  
*UCB/LBNL (CA 7) CAP:* Howard Hatayama

Throughout the CAP development process, other LBNL staff were called upon for comments, suggestions, and advice. These personnel included line managers, research staff, Safety Coordinators, Safety Liaisons, chair of the Safety Review Committee, and staff representing Contract Assurance, Human Resources, Facilities and EH&S.

**E. How the CAP is Organized**

The organization of this CAP is based on the seven corrective actions from the ISM Evaluation Report. Section II contains a narrative for each corrective action that discusses: (1) the objectives of the corrective action, (2) critical assumptions affecting the success of the action, (3) major activities supporting the corrective action, (4) the expected status or condition of the major activities on December 1, 2007<sup>1</sup>, and (5) the definition of closure for the major activities. This overview is intended to give the reader a summary of each of the seven corrective actions and the major activities supporting them.

Following each narrative is a table detailing the corrective actions. The first column of the table provides the suite of major activities for that corrective action. For those cases in which a major activity is derived from the PR CAP, that activity is also included in column 1 with the completion date shown in column 4. *Dates prior to the publication date of this CAP indicate that the activity has been completed.*

Column 2 is set aside for the Corrective Action Tracking System (CATS) number, which will be assigned within 30 days of when the CAP is finalized. The remaining columns are self explanatory with the possible exception of column 6 for Continuous

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<sup>1</sup> A checkpoint established by the DOE Berkeley Site Office (BSO) to assess progress in implementing improvements.

Improvement Plan. The entries in Column 6 are major activities whose implementation and institutionalization take them beyond the 12/01/2007 date. LBNL is committed to tracking these actions as part of the CAP and has, therefore, included them in this document.

**F. Senior Management Ownership and Oversight of the CAP**

The CAP Project Team Leader met at least weekly with the Chief Operating Officer and others on the Senior Management Team, as needed, during the development of this CAP. Several briefings were made to the LBNL Senior Leadership Council, the Division Directors' Meeting and the UC/LBNL Contract Assurance Council. The Director has demonstrated his support for the CAP by frequent issuance of communications stressing safety and the responsibility of all staff, and particularly of line managers, in achieving a safe working environment and implementing the principles of ISM. These activities will continue as LBNL proceeds with implementation of this CAP.

**G. LBNL's Commitment to the Implementation of the CAP and Subsequent Continuous Improvement**

The following programs and processes are based on the Lab's commitment to change as mandated by the CAP, and are designed to ensure effective implementation:

**Process for Tracking Implementation of CAP**

Progress on implementation of the CAP will be included as a routine agenda item in the quarterly performance reviews that are conducted between DOE, LBNL, and the University of California. LBNL will use its institutional Corrective Action Tracking System (CATS) as the mechanism for tracking implementation and closure of the corrective actions in this CAP. The University will draw on the UC/LBNL Contract Assurance Council to review the status of ES&H performance progress and the CAP implementation.

**CAP Change Control Process**

Changes that would materially alter a corrective action's approach or cause a delay of more than three months to its schedule must be approved by David C. McGraw, Chief Operating Officer. Changes that do not rise to this threshold will be reviewed and approved by Howard Hatayama, LBNL EH&S Division Director.

**Follow-up CAP Effectiveness Review Process**

Completion of major activities will be validated by LBNL within 60 days of completion and the corrective actions will be reviewed for effectiveness consistent with the UC Assurance Plan for Lawrence Berkeley National Laboratory.

### **Continuous Improvement**

LBNL is committed to continuous improvement of ISM through an annual review of the effectiveness of ISM. This annual review entails analysis of self-assessment outputs (Divisional S/A, ES&H Technical Assessments, and MESH(Management of Environment, Safety, and Health) Reviews) and analysis of line management inspection results, safety performance indicators, incident and occurrence reports, recommendations derived from external audits and assessments, and effectiveness of improvements implemented in the previous year. These inputs will result in recommendations to the LBNL Senior Leadership Council for improvements and revisions to the LBNL ISMS to meet the Laboratory's safety challenges.

## **II. McCALLUM-TURNER ISM EVALUATION REPORT CORRECTIVE ACTIONS**

### **1.0 Corrective Action 1- *Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)***

#### **Objectives**

The overall objective in implementing this corrective action and the one that follows is to develop and provide a means of sustaining a safety culture that: (1) includes safety responsibilities for all staff directing and overseeing work of others; (2) is based on Safety Performance Assessment (SPA) process for all safety line managers and staff; (3) accepts the need and value of measuring safety performance based on these new responsibilities; and (4) recognizes and rewards the value of safety as an integral part of accomplishing the Lab's mission.

The underlying objective is to define line management in a way that all those who direct, oversee, and/or mentor others are part of line management with respect to executing safety responsibilities. These definitions, having been developed, provide a platform for implementation of actions to improve the safety culture by: (1) clarifying the roles and responsibilities of line managers for safety and their accountability in this role, (2) improving lines of communications; and (3) ensuring that opportunities for improvement are identified and acted upon.

#### **Crucial Assumptions**

Currently, a large number of staff at LBNL who direct, train, and oversee other staff are not considered part of line management, nor classified as supervisors as defined by law and in the Regulations and Procedures Manual (RPM). The ambiguity of their status can lead to less than rigorous accountability for safety due to the absence of performance expectations. In the CAP, the term Safety Line Managers (non-Higher Education Employer Employee Relations Act (HEERA)) applies to those who direct, mentor, and oversee others but are not defined as supervisors in the RPM.

In order to be comprehensive, this population must be considered to have management responsibility for safety. Implementation of safety performance expectations for this population must be separate from the existing Performance Review Document (PRD) process managed by Human Resources because individuals in this population, largely post-docs, graduate students and guests, do not participate in the LBNL PRD process.

#### **Major Activities**

The basic tools and technical support for line management to effectively discharge their responsibility for safety are in place and being improved as part of this Corrective Action Plan. The elements include a new Job Hazards Analysis (JHA) Program,

improved qualifications and training for Safety Coordinators and Safety Liaisons, an enhanced role for the Safety Review Committee, and an improved line management workplace inspection training. The Job Hazards Questionnaire will be modified to facilitate identification of safety line managers and provide a basis for implementing training. Implementation of the Job Hazards Analysis process will provide policies, tools, and technical support to effectively address risk reduction in planning and conducting work within clearly defined authorizations. Clear individual and institutional performance expectations will be established to measure success and drive continuous improvement. More effective use of line management safety communications will help to motivate and reinforce commitment to safety and protection of the environment. These actions are discussed in more detail in Table 1 below.

Critical to long term effectiveness of these actions is the recognition and acceptance of the concept of Safety Line Managers and implementation of a safety performance assessment process for those who are not formal supervisors.

The effectiveness of the Safety Performance Assessment (SPA) and the need for continuous improvements will be determined through modifications to the Self-Assessment process to include the effectiveness of Safety Line Managers and the programs that support them in enhancing safety.

### **Condition/Status as of 12/1/2007**

During the remainder of 2007, safety performance expectations will be developed for current line managers for use in the 2007 PRD process in mid-summer. The basic steps necessary to institutionalize the concept of Safety Line Managers (non-HEERA) will be completed. These are: (1) developing consistent policies throughout ISMS, (2) specifying safety responsibilities and expectations, (3) identifying the population of safety line managers/work leads, (4) development of performance expectations, and (5) initiation of training for these individuals.

### **Final Closure**

Final closure is when the basic steps necessary to institutionalize the concept of Safety Line Managers (non-HEERA) are completed and the safety performance assessment process for these individuals is underway. Line responsibility and accountability for safety is further emphasized and supported by Corrective Action 6. The ongoing feedback and improvement effort using the mechanisms identified in the actions responding to Corrective Actions 3,4 and 5 will also promote institutionalization of these changes.

**Table 1 - CORRECTIVE ACTION 1**

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

***Corrective Action 1: Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)***

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>1.1 Assure that safety behaviors/expectations are clear, formal, understood, and implemented (see next major activity).</p> <p>Revise Communication Plan to emphasize line management's authority and responsibility in work place safety and ISM.</p> <p>Define safety line management, work leads, and clarify other management terms in PUB 3000.</p> <p>Enhance Safety performance expectations in Performance Review Document (PRD) evaluations to reinforce responsibilities of supervisors as Safety Line Managers.</p> <p>Develop Safety Performance Assessment (SPA) process using PRD expectations for Safety Line Managers (non-HEERA) .</p>		<p>New Communication Plan</p> <p>Safety line management terms defined in PUB 3000, Chapter 1.</p> <p>PRD process that evaluates safety performance of all LBNL supervisors as Safety Line Mangers (PUB 3000, Chapter 1) based on enhanced safety expectations.</p> <p>Safety Performance Assessment (SPA) based on the enhanced safety expectations used in the PRD process to assess safety performance of Safety Line Managers (non-HEERA, PUB 3000, Chapter 1).</p>	<p>9/29/06(A)</p> <p>11/27/06(A)</p> <p>06/30/07</p> <p>11/30/07</p>	<p>David McGraw</p> <p>David McGraw</p>	<p>Analyze results from pilots and revise process as necessary.</p> <p>Review effectiveness annually and revise expectations, policies, and procedures to meet current goals and challenges.</p> <p>Implement performance reviews of all staff (PRD or SPA, depending upon HIR status) based on the enhanced safety expectations.</p>

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 1: Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>Provide policies in Institutional ISM Plan to require and guide divisions in identifying safety line managers.</p> <p>Modify Job Hazards Questionnaire (JHQ) to include newly identified safety line managers (e.g.; mentors, post docs, guests) and triggers for training requirements.</p> <p>Revise current line manager training or develop new course for Safety Line Managers/Work Leads who are not defined as supervisors under HEERA.</p>		<p>Modified Institutional ISM Plan to support SPA process.</p> <p>JHQ modified to identify individuals who might qualify as Safety Line Managers (non-HEERA).</p> <p>Initial training for non-HEERA Safety Line Managers.</p>	<p>06/30/07</p> <p>06/30/07</p> <p>8/31/07</p>	<p>David McGraw</p> <p>Howard Hatayama</p> <p>Howard Hatayama</p>	
<p>1.2 Assure that line management authority is unambiguous, universally understood, and accepted.</p> <ul style="list-style-type: none"> <li>• Line managers provide assurance and approval of all hazard analyses and work authorization documentation.</li> <li>• Safety leadership and safety performance expectations are explicitly communicated to – and understood by – line managers.</li> <li>• Line managers actively involve workers in work planning.</li> </ul>					

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 1: Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>Job Hazards Analysis Policy and Procedure approved and implement via PUB 3000 (see Section 6).</p> <p>Training of Line Managers on responsibilities and conducting work place assessments.</p> <p>Revise S/A to verify, evaluate, and monitor the implementation and effectiveness of work place inspections by Safety Line Managers and drive continuous improvement. (See CA 3)</p> <p>Add involvement of workers in work planning to mandated policy statements in divisional ISM plans and to the performance expectations for all categories of Safety Line Managers/Work Leads</p> <p>See Major Activity 1.1 and CA 6 for additional related activities</p>		<p>Chapter 32 in PUB 3000</p> <p>Initial training of Safety Line Managers to conduct work place inspections</p> <p>Revise division S/A criteria to include evaluation of effectiveness of workplace inspections.</p> <p>Worker involvement included in policies and ISM plans.</p>	<p>03/02/07(A)</p> <p>10/11/06(A)</p> <p>11/30/07</p> <p>11/30/07</p>	<p>Howard Hatayama</p> <p>Howard Hatayama</p> <p>John Chernowski</p> <p>Howard Hatayama</p>	

**Corrective Action 1: Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>1.3 Assure that existing procedures are both fully understood and are being consistently followed; for example, promoting consistent and complete compliance with controls (PPE) identified in laboratory procedures and ensuring requirements are explicit.</p> <p>Revise Self-Assessment (division S/A., ESH Technical Assurance, MESH Reviews) to appraise understanding and compliance with expectations for hazard identification and control and their alignment to work authorization.</p>		<p>Modifications made to S/A process (see CA 5) to include impact of Safety Line Manager/Work Lead responsibilities on the assessment process and provide basis for assuring compliance with Safety Line Manager policies and expectations and implementation of Job Hazards Analysis (JHA) process.</p>	01/31/08	John Chernowski	

**2.0 Corrective Action 2 - Restructure and refine institutional EHS/ISMS documents (Guiding Principles 1, 2, and 5)**

**Objectives**

The objective of Corrective Action 2 is to provide a hierarchy of ISMS documents starting at the top with a Mission Statement and/or set of Safety Aims. This global message will be consistently replicated in a manner appropriate for each “daughter” document with the intent of reinforcing LBNL’s commitment to safety at every level of policy and procedure. This hierarchical approach will make clear to all employees, particularly those who supervise, direct, oversee or mentor other workers, that they are responsible and accountable for ensuring worker safety, maintaining a safe workplace, and making safety an integral part of work planning and tasking.

**Crucial Assumptions**

LBNL’s policies and communications need to consistently reinforce the Laboratory’s commitment to safety and the importance for managers and staff to be active participants in maintaining a safe workplace.

**Major Activities**

The major activities associated with this action include:

- Develop an institutional safety mission statement and/or a set of safety aims.
- Review and revise, as needed, all documents in the ISM hierarchy to ensure that the Laboratory’s safety goals and the responsibilities of Safety Line Managers are clear, consistent, and comprehensive throughout.
- Based on the new definition of Safety Line Management, review and revise applicable documents to clarify safety responsibilities for Safety Line Managers/Work Leads and individual workers.
- Revisions to each document are to be approved and accepted by the original signatories and, as appropriate, by the Safety Review Committee on behalf of line management.
- Continue to improve safety qualifications and training of Safety Coordinators and Safety Liaisons.
- Formalize the existing Work Smart Standards review and acceptance process and add a mechanism for reviewing and accepting industrial standards.

**Condition/Status as of 12/1/2007**

All major activities listed in the Corrective Action Plan for Corrective Action 2 will be completed.

**Final Closure**

Final Closure is achieved when the LBNL ISM document hierarchy has been defined, the roles and responsibilities of key players in ISM implementation (SRC, Division Safety Coordinators, Safety Liaisons) have been defined and are consistently articulated in the LBNL ISMS description, and the WSS system is appropriately modified and documented.

**Table 2 - CORRECTIVE ACTION 2**

**Corrective Action 2: Restructure and refine institutional EHS/ISMS documents  
(Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>2.1 Clarify the hierarchy, functionality, and relationship among institutional documents (e.g., RPM, PUB-3000, Operating and Assurance Plan/Quality Assurance Plan, and Assurance Plan).</p> <p>Review and revise ISMS related documents to establish the hierarchical link by clarifying the relationship to LBNL's overall safety goals and mission in the body of ISMS documents (e.g., Institutional (ISMS Plan, RPM, OAP (Operating and Assurance Plan), PUB 3000, SRC Charter) and in EH&amp;S management plans (e.g., Radiation Protection Plan, Environmental Management Plan, Worker Health and Safety Plan, Biosafety Charter) to facilitate a clear understanding of the relationship between the high level overarching mission statement of safety goals and safety/management policies that flow down from them at the safety implementation level (EH&amp;S Management Plans and Standard Operating Procedures; Divisional ISM Plans and safety management expectations for all staff).</p>		<p>A hierarchy of ISMS documents starting at the top with a Mission Statement or set of Safety Aims</p>	<p>11/30/07</p>	<p>Howard Hatayama</p>	

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity

Integrated Safety Management System (ISM) Evaluation Corrective Action Plan

**Corrective Action 2: Restructure and refine institutional EHS/ISMS documents  
(Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>2.2. Provide an overarching set of Laboratory safety values, principles, and expectations for individual position descriptions.</p> <ul style="list-style-type: none"> <li>• Articulate an overall statement of safety value for the Laboratory.</li> <li>• Define highest level set of essential safety behaviors and expectations for line managers, subject matter experts, and staff in general</li> <li>• Clarify expectations for Safety Liaisons.</li> <li>• Establish Laboratory-level training and qualification standards for Safety Coordinators</li> </ul> <p>Review the statements and communications recently issued by senior management with respect to commitment to safety with the aim of developing a current set of high level goals and aims for safe, productive, and quality work.</p> <p>Review the policies regarding the role, responsibilities and specific expectations for Safety Liaisons. Revise with the aim of establishing a consistent set of expectations that define the Safety Liaison role(s) and a set of triggers that signal Safety Liaison engagement. Provide policy and performance expectations to minimize conflicts between a Liaison's programmatic and ES&amp;H role</p>		<p>An approved set of high level safety goals</p> <p>Enhanced and clarified duties, responsibilities, qualifications, and training for Safety Liaisons.</p>	<p>11/30/07</p> <p>2/20/07(A)</p>	<p>Howard Hatayama</p> <p>Howard Hatayama</p>	

**Integrated Safety Management System (ISMS) Evaluation Corrective Action Plan**

**Corrective Action 2: Restructure and refine institutional EHS/ISMS documents  
(Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>that might arise from unclear perception of responsibilities required to implement ISMS requirements.</p> <p>Review and revise as needed the annual Performance Review Document for Safety Liaisons to ensure that Liaison responsibilities are recognized and clearly measured as part of the review.</p> <p>Determine and formalize the minimum qualifications of safety coordinators.</p> <p>Review recent improvements to the qualifications and training of Safety Coordinators and re-evaluate the effectiveness and performance of the Safety Coordinator program</p>		<p>Revised Performance Review document incorporating duties for Safety Liaisons.</p> <p>Enhanced and clarified qualifications, roles and responsibilities, and training for Safety Coordinators.</p> <p>Self-assessment of the Safety Coordinator program based on above revisions</p>	<p>6/30/07</p> <p>8/02/06(A)</p> <p>10/31/07</p>	<p>Howard Hatayama</p> <p>Howard Hatayama</p> <p>Howard Hatayama</p>	
<p><b>2.3 Establish an explicit process for translating new requirements into implementing practices.</b></p> <ul style="list-style-type: none"> <li><b>Codify the role of the Safety Review Committee in Laboratory procedure</b></li> <li><b>Ensure process for translating new requirements into lower level procedures is codified.</b></li> <li><b>Ensure that process for identifying relevant industrial requirements is systematic, formalized,</b></li> </ul>					

**Integrated Safety Management System (ISMS) Evaluation Corrective Action Plan**

**Corrective Action 2: Restructure and refine institutional EHS/ISMS documents  
(Guiding Principles 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>and understood.</p> <p>Revise the charter and membership qualifications of the Safety Review Committee (SRC) to meet needs arising from implementation of improvements identified in the 2006 PR Root Cause process.</p> <p>Improve the process for annually updating the Work Smart Standards (WSS). Review and revise the letter from David McGraw dated 4/02/01 to formally establish a governing policy and provide a basis for procedure(s) to implement the process. Specifically, a policy and guidance document is needed to clarify the following aspects:</p> <ul style="list-style-type: none"> <li>- Process for identification and analysis of new requirements or changes to existing requirements;</li> </ul>		<p>Revised Charter in Pub 3000</p> <p>Formal procedures for review, acceptance, and implementation of improvements in response to new regulations and industrial standards.</p>	<p>10/15/06(A)</p> <p>7/31/07</p>	<p>Don Lucas</p> <p>David McGraw</p>	<p>The placement or location of the SRC Charter in the document hierarchy (Corrective Action 2) and its relationship to other policy documents needs to be reviewed. The review should ensure that the Charter delineates the responsibilities of the SRC and its relationship to and impact on other organizational entities and to the ISMS as a whole. Other documents in the hierarchy need to reflect the role of the SRC</p>

***Corrective Action 2: Restructure and refine institutional EHS/ISMS documents  
(Guiding Principles 1, 2, and 5)***

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<ul style="list-style-type: none"> <li>- Collection of information indicating potential needs for WSS updates, either due to new regulations or new projects and activities;</li> <li>- The role of EH&amp;S subject matter experts (SMEs), including use of JHA data, in gathering and reviewing this information and submitting recommended changes to the WSS coordinators;</li> <li>- The responsibilities of the LBNL WSS coordinator and the BSO counterpart in collecting and reviewing information, achieving internal approval on amendments to the Contract, and in the submission to UCOP.</li> <li>- The responsibility of LBNL WSS coordinator in disseminating the changes to EH&amp;S SMEs;</li> <li>- The role of the SMEs in implementing policy and procedures changes mandated by the contract modifications, either directly through the EH&amp;S technical programs or by means of SRC approval and implementation process; and</li> <li>- A clear expectation that PUB 3000 must be reviewed and revised in response to modifications to the WSS set in a manner that drives implementation in the field.</li> </ul>					

**Integrated Safety Management System (ISMS) Evaluation Corrective Action Plan**

***Corrective Action 2: Restructure and refine institutional EHS/ISMS documents  
(Guiding Principles 1, 2, and 5)***

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>Develop a process for identifying relevant industrial requirements that is aligned with that for updating WSS. At the time of seeking updates to the WSS set, the LBNL WSS coordinator seeks information on industrial standards and best practices from Lab SME's and other institutions for implementation at LBNL. Any requirements or improvements identified through this process will be processed through the cognizant SMEs and processed through the SRC as outlined above.</p>		<p>See above</p>			

**3.0 Corrective Action 3 - Increase the rigor of the performance management process (*Core Function 5*)**

**Objectives**

The primary objective of Corrective Action 3 is to increase the rigor of performance management. Key to this process is improving the assurance systems for performance management. In implementing major activities for Corrective Action 3, LBNL will establish overall institutional ES&H performance objectives, align ES&H Self-Assessment with these objectives, and enhance ES&H Self-Assessment to better identify significant issues, deficiencies, and opportunities for improvement. To ensure that assurance is responsive to changing conditions, LBNL will routinely analyze self-assessment results to promote continuous improvement of assurance systems and processes. (See Corrective Action 4 for details on event-based trending and analysis.) As an output of improved assurance, LBNL will also identify best practices and lessons learned and disseminate this information to appropriate Lab staff.

**Crucial Assumptions**

A crucial assumption to the success of these improvements is that enhanced and newly developed systems are effectively implemented by safety managers and accepted by the Lab community.

**Major Activities**

Major activities in enhancing ESH assurance systems include developing robust internal review of self-assessment results and the processes that produced the results. LBNL will develop a methodology for annually reviewing effectiveness of ESH assurance systems as well as trending and analysis methodologies and will apply this process to self-assessment results. LBNL has hired a lessons learned and best practices program manager, and is developing implementing procedures for this program. Finally, as the FY07 ESH self-assessment cycle ends on September 30, 2007, LBNL will use the months of October and November to analyze and trend self-assessment results to identify significant issues. Additionally, mechanisms to utilize on-site safety performance data for sub-contractors and vendors will be developed.

**Condition/Status as of 12/1/2007**

LBNL expects to develop and implement the methodologies that will improve the assurance systems for performance management before December 1, 2007.

**Final Closure**

Effectiveness reviews of ESH Self-Assessment systems are conducted annually and documented. Self-assessment results are analyzed for significant trends, and identified in the LBNL FY07 ESH Self-Assessment Report. The Lessons learned program manager is hired and implementation procedures are documented and effected. Mechanisms for worker feedback as well as those that utilize on-site safety performance data for sub-contractors and vendors are in place.

**Table 3 - CORRECTIVE ACTION 3**

Integrated Safety Management System (ISM) Evaluation Corrective Action Plan

**Corrective Action : 3. Increase the rigor of the performance management process  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan CIP)
<p>3.1 Enhance Laboratory-level processes through</p> <ul style="list-style-type: none"> <li>Assuring performance objectives are derived from overarching EHS and operational end-state goals and objectives</li> <li>Assuring performance objectives form basis for monitoring organizational and functional performance</li> <li>Developing processes for monitoring and verifying the maturation of the systems, including (a) assuring that trending and analysis activities comprehensively examine performance data and provide a basis for improvements; and (b) assuring that OIA systematically evaluates performance of the Laboratory's assurance processes (e.g., Quality Assurance Program).</li> <li>More thoroughly identifying, communicating, and taking advantage of the best practices that are in use in some divisions.</li> </ul> <p>Review and revise performance objectives in ES&amp;H documents in light of the Laboratory's new mission and aims statement.</p> <p>Revise Division Self-Assessment criteria to provide greater alignment between organizational goals and EHS functional goals.</p>		<p>Performance objectives that provide a basis for assessing the Lab's ability to meet its new overarching goals and objectives (see CA 2.)</p> <p>Division Self-Assessment criteria reflect significant PUB-3000 and Institutional ISM Plan objectives.</p>	<p>3/31/08</p> <p>02/07(A)</p>	<p>Howard Hatayama</p> <p>John Chernowski</p>	

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity  
3/30/2007

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action : 3. Increase the rigor of the performance management process  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan CIP)
Revise PUB-5344 and PUB-3105 upon final implementation of ESH Technical Assurance program and Division Self-Assessment.		Program documents describe current ESH self-assessment systems and methodology on performing division self-assessment.	09/30/07	John Chernowski	
Revise IFA and MESH protocol for FY06 S/A cycle to address significant ESH concerns.		IFA and MESH reviews focused on key aspects of ISM.	05/06(A)	John Chernowski	
Revise PUB-5344 for FY06 SA cycle to address significant ESH concerns.		PUB-5344 current.	09/06(A)	John Chernowski	
Develop methodology for annually reviewing effectiveness of assurance systems. Methodology will address: 1) are reviews following protocol, 2) do review protocols address institutional needs, and 3) are conditions/events being manifested that reviews should have, but did not, identify.		Assurance system review procedure developed to monitor effectiveness of assurance system and identify strengths and weaknesses in the system..	9/30/07	John Chernowski	Annual review of performance results to assess effectiveness of assurance systems.
Incorporate implementing procedures for trending and analysis of performance data into overall IMP.		See Corrective Action 4.	9/30/07	John Chernowski	
Apply analysis and trending methodology to ESH Self-Assessment results.		FY07 ESH Self-Assessment Report identifies significant trends/ best practices/ opportunities for improvement.	11/30/07	John Chernowski	
Develop Lessons Learned and Best Practices Database.		Lessons Learned (LL) and Best Practices (BP) database on LBNL website, records and maintains LL/ BP	11/06(A)	John Chernowski	

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action : 3. Increase the rigor of the performance management process  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
Incorporate implementing procedures for developing lessons learned and corrective actions into overall IMP.		entries, disseminates new entries. See Corrective Action 4. Also, methodology for assessing lessons learned implementation are developed and incorporated into assurance mechanisms	9/30/07	John Chermowski	Technical Assurance will monitor implementation of lessons learned and best practices
<p><b>3.2. Enhance functional and/or organizational processes</b></p> <ul style="list-style-type: none"> <li>Using a formal process to evaluate subcontractor and vendor safety performance</li> <li>Maintaining subcontractor and vendor safety performance records for use in future selections.</li> <li>More consistently documenting and sharing worker feedback.</li> </ul> <p>Develop mechanisms to utilize accumulated on-site inspection records and performance data as one of the criteria for awarding contracts.</p> <p>Vendors not qualified for the "Designated Services List" must submit a safety plan describing the work, hazards, and controls as part of the contract. Incidents while on site will be tracked.</p>		Enhanced process for collecting and utilizing a subcontractor's safety record as part of the selection process for future contracts.  A process for collecting and utilizing a vendor's on-site safety record in evaluating and awarding contracts.	4/30/07  4/30/07	Howard Hatayama  Howard Hatayama	

**Integrated Safety Management System (ISMS) Evaluation Corrective Action Plan**

**Corrective Action : 3. Increase the rigor of the performance management process  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan CIP)
<p>Document worker feedback from pre-job briefs, job hazard walk-downs, behavior based program Workers Observing Workers (WOW), safety meeting minutes, post-job reviews, formal monthly employee feedback reports, and other sources (e.g., WOW Suggestion Boxes, Employee Concerns Hot Line) as basis for lessons learned. Information determined to require a corrective action is entered in the CATs and opportunities for improvement are entered into the safety performance database. The information from these sources are the foundation of the EHS/Facilities lessons learned program.</p>		<p>Lessons learned program that utilizes documented and categorized worker safety comments and concerns</p>	<p>6/30/07</p>	<p>Howard Hatayama</p>	

**4.0 Corrective Action 4 - *Fully implement an integrated Corrective Action Management System (Core Function 5)***

**Objectives**

The primary objective of Corrective Action 4 is to fully implement an Issues Management Program (IMP) that is consistent with DOE Order 226.1 requirements. Developing and implementing an IMP requires establishing roles and responsibilities for Lab staff, developing and implementing procedures for causal analysis, trending, and effectiveness and extent of condition review of corrective actions. Finally, LBNL will develop capabilities to assure that the IMP is properly implemented and operating effectively by integrating program performance into the ESH self-assessment program.

**Crucial Assumptions**

Development of this program will require a favorable response from Lab staff, who will be responsible for implementing the new requirements of DOE Order 226.1. This includes line management buy in and clear support for the IMP.

**Major Activities**

The major activities for developing and implementing the IMP involve: establishing program ownership, developing and implementing procedures for the program elements, and assuring that the program is effective. Program ownership is established by hiring an IMP manager and clearly defining roles and responsibilities for that position and the overall program in a policy document and in implementing procedures. Once key elements of the IMP are identified, LBNL will develop implementing procedures and train Lab staff to support effective enactment of IMP elements and requirements. LBNL will integrate IMP elements and monitor effectiveness through the ESH self-assessment program.

**Condition/Status as of 12/1/2007**

By December 1, 2007, LBNL will have staffed the IMP manager position, developed requisite policy documents and implementation procedures, and developed a staff training program. IMP elements will be enacted and subsequently reviewed through the ESH self-assessment program.

**Final Closure**

Ongoing and robust review of IMP elements in promoting continuous improvement will occur during FY08, as the program requirements are fully implemented across the Lab.

**Table 4 - CORRECTIVE ACTION 4**

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 4: Fully implement an integrated Corrective Action Management System (Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
4.1 Establish clear responsibilities for action ownership through the entire process.					
Hire ESH Assurance Program Manager responsible for Issues Management Program (IMP) development.		ESH Assurance Program Manager position staffed.	02/07(A)	John Chernowski	
Identify IMP elements.		Outline of IMP elements.	4/30/07	John Chernowski	
Develop CATS database.		CATS database developed, used by all divisions for tracking safety deficiencies.	12/05(A)	John Chernowski	
Develop IMP policy document.		DOE approved UC/ LBNL Assurance Plan to serve as IMP policy document.	6/30/07	John Chernowski	
Incorporate IMP elements into ESH Technical Assurance Program.		ESH Technical Assurance Program addresses IMP elements.	10/31/07	John Chernowski	
Establish CATS Facilities/ EHS/ OCA review committee.		CATS Review Committee charter approved by LBNL COO.	4/30/07	David McGraw	
Identify roles and responsibilities in policy document and implementing procedures.		UC/ LBNL Assurance Plan and IMP implementing procedures detail roles and responsibilities	9/30/07	John Chernowski,	

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity

<i>Corrective Action 4: Fully implement an integrated Corrective Action Management System(Core Function 5)</i>					
Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>4.2. Provide enhanced guidance and functionalities for graded application of:</p> <ul style="list-style-type: none"> <li>• Preferred causal analysis tools and their application</li> <li>• Triggers for and methods used to conduct extent-of-condition reviews</li> <li>• Level of formality and methods used to verify action closure</li> <li>• Triggers for and methods used to conduct effectiveness reviews.</li> </ul> <p>Develop IMP implementing procedures.</p> <p>Provide introductory training as well as trending and analysis training to LBNL safety managers and staff.</p> <p>Develop training for IMP</p>		<p>IMP implementing procedures</p> <p>45 LBNL safety managers and staff received introductory training.</p> <p>Training materials developed, training sessions scheduled</p>	<p>9/30/07</p> <p>01/07(A)</p> <p>9/30/07</p>	<p>John Chernowski</p> <p>John Chernowski</p> <p>John Chernowski</p>	<p>Annually incorporate IMP elements into ESH Self-Assessment systems, as appropriate.</p>

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 4: Fully implement an integrated Corrective Action Management System(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p><b>4.3. Monitor timeliness and system effectiveness in achieving its objectives.</b></p> <p>Monitor timeliness of corrective action entry and resolution, including incorporating CATS measures in FY07 Division Self-Assessment Performance criteria.</p>		<p>Monthly CATS review with division safety coordinators and LBNL COO. CATS measures included in FY07 Division Self-Assessment</p>	<p>2/07(A)</p>	<p>John Chernowski</p>	<p>Assess effectiveness of IMP elements, including implementation of policies and procedures.</p>

**5.0 Corrective Action 5 - *Strengthen Laboratory self-assessment processes (Core Function 5)***

**Objectives**

The primary objective of this corrective action is to improve the ESH self-assessment program by enhancing the systems that comprise it. Division Self-Assessment will be aligned with institutional and division ESH goals and objectives. An ESH Technical Assurance program, focused on evaluating institution-wide performance and effectiveness of ESH programs, will replace the division-focused Integrated Functional Appraisal process.

**Crucial Assumptions**

Key assumptions are that divisions can adequately perform the revised Division Self-Assessment and that the Technical Assurance program is effectively implemented by the EH&S Division and accepted by the Lab community.

**Major Activities**

The major activities that will improve ESH self-assessment are: (1) development and application of a risk-based gap analysis, (2) development and implementation of an ESH assurance effectiveness review methodology, and (3) development of the Technical Assurance program. The risk based gap analysis will identify areas that require increased focus from ESH assurance systems. Development of an ESH assurance effectiveness review methodology will serve as the basis for annual internal review of the primary self-assessment programs. Also key is the Technical Assurance program which will evaluate programmatic effectiveness across the institution in a more detailed, focused, and explicit manner than previously employed. Technical Assurance is also an important mechanism in implementing and monitoring key IMP elements (see Corrective Action 4).

**Condition/Status as of 12/1/2007**

All three of the major activities noted above will be implemented prior to December 1, 2007. The risk-based gap analysis will be used to determine the primary components of the Technical Assurance program and will also be considered in developing the FY08 Division Self-Assessment performance measures. LBNL will use FY07 ESH self-assessment results to analyze effectiveness and identify FY08 improvement opportunities for the ESH self-assessment program. Finally, the ESH Technical Assurance program will be implemented during October 2007.

**Final Closure**

Risk-based analysis is completed and the results are integrated into the audit plans for ESH Technical Assurance. All ESH Technical programs receiving review during FY08 have finalized review plans.

**Table 5 - CORRECTIVE ACTION 5**

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 5: Strengthen Laboratory self-assessment processes  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>5.1. Structure the Division self-assessment process around Division-specific EHS and operational performance objectives that are aligned with institutional expectations.</p> <p>Develop and implement risk-based gap analysis methodology to calibrate self-assessment processes and focus on priorities.</p> <p>Develop and implement methodology for annually reviewing effectiveness of assurance systems. Methodology will address: 1) are reviews following protocol, 2) do review protocols address institutional needs, and 3) are conditions/events being manifested that reviews should have, but did not, identify</p> <p>Revise division self-assessment process around division and institutional ESH objectives and expectations</p>		<p>Procedure for risk-based gap analysis methodology of assurance systems developed and implemented.</p> <p>Assurance system review procedure developed and initiated.</p> <p>FY07 Division Self-Assessment criteria revised to provide greater alignment between self-assessment goals and ESH objectives and expectations</p>	<p>6/30/07</p> <p>11/30/07</p> <p>02/07(A)</p>	<p>John Chernowski</p> <p>John Chernowski</p> <p>John Chernowski</p>	

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity

**Corrective Action 5: Strengthen Laboratory self-assessment processes  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p><b>5.2. Incorporate expectations (methods, scope, etc.) associated with MESH reviews into Division self-assessments.</b></p> <p>Revise Division Self-Assessment Program Manual (PUB-3105) to support divisions in performing self-assessments. Division self-assessment expectations should align with MESH expectations in reviewing implementation of division ISM plan (i.e. division self-assessment should detect deficiencies before a MESH review).</p>		<p>Revised PUB-3105 provides sound basis, including methods and scope, for performing division self-assessment.</p>	<p>6/30/07</p>	<p>John Chernowski</p>	
<p><b>5.3. Incorporate a prioritization process for identifying and conducting Division self-assessment activities based on mission objectives and evaluation of risks to the organization.</b></p> <p>Develop and implement risk-based gap analysis methodology to calibrate self-assessment processes and focus on priorities.</p>		<p>Procedure for risk-based gap analysis methodology of assurance systems developed and implemented. (Applied to FY08 Division Self-Assessment criteria in late Fall 2007.)</p>	<p>6/30/07</p>	<p>John Chernowski</p>	

**Corrective Action 5: Strengthen Laboratory self-assessment processes  
(Core Function 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>5.4. Conduct institution-wide program evaluations (e.g., IFAs) on a risk-prioritized basis, which are designed to assure that program improvements are identified and the program is fully integrated with other systems.</p> <p>Develop and implement risk-based gap analysis methodology to calibrate self-assessment processes and focus on priorities</p> <p>Develop and implement ESH Technical Assurance program to conduct institution-wide ESH program evaluations.</p>		<p>Procedure for risk-based gap analysis methodology of assurance systems developed and implemented.</p> <p>ESH subject matter experts perform, on a risk-prioritization basis, institution-wide program evaluations and report results to EHS Division, OCA, and subject divisions (as applicable).</p>	<p>6/30/07</p> <p>10/31/07</p>	<p>John Chernowski</p> <p>John Chernowski</p>	

*Corrective Action 5: Strengthen Laboratory self-assessment processes  
(Core Function 5)*

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>5.5. Provide assurance that these processes/programs are conducted effectively, are implemented properly, and result in identifiable improvements to performance (e.g., OIA function).</p> <p>Using assurance systems effectiveness review methodology, review Division Self-Assessment, MESH, and ESH Technical Assurance programs.</p>		<p>See Major Activity 3.1</p> <p>Division Self-Assessment modified for FY08 to address findings of effectiveness reviews.</p>	<p>9/30/07</p> <p>11/30/07</p>	<p>John Chernowski</p> <p>John Chernowski</p>	<p>Annually assess effectiveness of ESH self-assessment systems.</p> <p>MESH review and ESH Technical Assurance programs reviewed during late 2007/early 2008, when assessments are completed.</p>

**6.0 Corrective Action 6 - Increase the rigor and consistency of the work planning and control processes (*Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5*)**

**Objectives**

The overall objective of Corrective Action 6 is to improve the safety analysis, work planning and work authorization processes at LBNL. Specifically, while many elements of work planning and authorization are presently being used, they need to be improved by assuring adherence, and expanded by encompassing more of the work that is performed across LBNL.

**Crucial Assumptions**

Crucial assumptions are: a) any changes are consistent with other drivers, for example 10 CFR851 and fundamental principles of Integrated Safety Management; b) any processes developed should use existing systems to the extent feasible (greater familiarity to and acceptance by the community), allow for the wide variety of work undertaken at LBNL on both the research and operations sides (no “one size fits all” solution), and recognize that implementing resources are limited; c) any systems developed and requirements imposed must be straightforward to validate.

**Major Activities**

Major activities planned include: a) modifying the existing Job Hazards Questionnaire process into a more comprehensive Job Hazards Analysis tool, which will analyze work, define the hazards therein, and prescribe controls necessary to mitigate those hazards; (note: this will resolve the issue of what level of work is analyzed: all work that is at a level of hazard above that generally accepted by the public will be included); and b) reviewing existing work authorization processes and enhancing them where necessary.

**Condition/Status as of 12/1/2007**

The status of major activities at this time will be: a) JHA process has been incorporated as institutional policy, b) pilot program for the JHA process will be completed, c) facilities-related issues are complete or are well towards completion.

**Final Closure**

The definition of final closure for each major activity is listed in the table below. In general, an item will be closed when a process has been developed and is well along the path to full implementation. For the JHA process, this means 75% of the affected Lab population has completed a JHA. It is anticipated that institutionalization of these work planning and control elements of ISM will involve an ongoing feedback and improvement effort using the mechanisms identified in the major activities responding to Corrective Actions 3, 4 and 5 above.

**Table 6 - CORRECTIVE ACTION 6**

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 6: Increase the rigor and consistency of the work planning and control processes  
(Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>6.1. Reconsider, develop, and deploy minimum standards and expectations for allowing workers to interact with hazards before they have been fully qualified (including whether unsupervised work with certain hazards will be allowed, the level of supervision required, etc.).</p> <p>Develop Job Hazards Analysis process to incorporate specific authorization by the Work Leader to perform elements of work in accordance with a set of qualification requirements (i.e., controls)</p>		Job Hazards Analysis process published in PUB-3000 (Health and Safety Manual)	3/2/07(A)	John Seabury	
<p>6.2. Re-examine the very high (as compared to other Laboratories) threshold of hazard that triggers the use of more formal hazard analysis and authorization</p> <p>Develop Job Hazards Analysis process to incorporate work with all levels of hazard above those generally accepted by the public.</p> <p>Pilot the JHA process with selected work groups.</p>		Job Hazards Analysis process published in PUB-3000 (Health and Safety Manual)  Work groups for pilot program selected.  90% of individuals in pilot work groups have completed JHA.	3/2/07(A)  4/30/07  8/31/07	John Seabury  Richard Debusk  Richard Debusk	

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

<b>Corrective Action 6: Increase the rigor and consistency of the work planning and control processes (Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)</b>					
<b>Major Activities</b>	<b>CATS ID</b>	<b>Outcome/Deliverable at Closure</b>	<b>Completion Date<sup>2</sup></b>	<b>Responsible Person</b>	<b>Continuous Improvement Plan (CIP)</b>
Determine Lessons Learned from the pilot program, revise the JHA process accordingly.		Revised JHA process submitted for SRC review/approval.	10/31/07	John Seabury	75% of affected LBNL population has completed JHA
		10% of affected greater LBNL population has completed JHA	11/30/07	John Seabury	Assess effectiveness of JHA process including implementation of policies and procedures
		75% of affected LBNL population has completed JHA	5/31/08	John Seabury	
Revise PUB-3000, Chapter 6 "Safe Work Authorization" to align with the JHA process.		Revised PUB-3000, Chapter 6 submitted for SRC review/approval	10/31/07	John Seabury	
<b>6.3 Develop effective and efficient ways to identify, communicate, and demonstrate control of lower risk/common hazards (e.g, routine use of chemicals, sharps, etc.)</b>					
JHA process to include consultation between Work Lead and Worker to review and control all hazards		Job Hazards Analysis process published in PUB-3000 (Health and Safety Manual)	3/2/07(A)	John Seabury	

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

<b>Corrective Action 6: Increase the rigor and consistency of the work planning and control processes (Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)</b>					
<b>Major Activities</b>	<b>CATS ID</b>	<b>Outcome/Deliverable at Closure</b>	<b>Completion Date<sup>2</sup></b>	<b>Responsible Person</b>	<b>Continuous Improvement Plan (CIP)</b>
<p><b>6.4 Establish an up-to-date SAD, a USI procedure, and a clear and widely known shielding policy for ionizing and non-ionizing radiation.</b></p> <p>Revise ALS SAD (Safety Analysis Document) to reflect current conditions.</p> <p>Establish and communicate ALS USI (Unreviewed Safety Issues) procedure.</p> <p>Establish and communicate ALS shielding policy.</p>		<p>Revised Safety Analysis Document for ALS</p> <p>Established USI procedure at ALS including evidence of communicating that procedure to stakeholders.</p> <p>Established shielding policy at ALS including evidence of communicating that procedure to stakeholders.</p> <p>Revised PUB-3000, Chapter 6.</p>	<p>8/31/07</p> <p>8/31/07</p> <p>8/31/07</p> <p>10/31/07</p>	<p>Ben Feinberg</p> <p>Jim Floyd</p> <p>Jim Floyd</p> <p>John Seabury</p>	
<p><b>6.5. Establish a process to make sure workers are skilled in hazard recognition</b></p> <p>Provide refresher training on Facilities Job Hazards Analysis process first conducted in 2003.</p>		<p>90% of affected workers retrained.</p>	<p>6/30/07</p>	<p>Janice Sexson</p>	

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

<i>Corrective Action 6: Increase the rigor and consistency of the work planning and control processes (Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)</i>						
Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)	
<p>6.6. Assure that hazard information is current by implementing the HEAR (Hazard, Equipment, Authorization, and Review) database upgrades</p> <p>Complete the planned updates to coordinate HEAR and Maximo.</p>		<p>HEAR upgrades complete per the Project Charter for "Hazards Equipment Authorizations Review/HEAR 2007" project.</p> <p>Maximo upgrades complete per the Project Charter</p>	<p>10/31/07</p> <p>6/30/07</p>	<p>Paul Blodgett</p> <p>Linda Pratt</p>		
<p>6.7. Tailor Maximo-generated JHA checklists for specific crafts to improve relevancy and encourage use</p> <p>JHA process to include craft-specific and task/work specific information</p>		<p>See Major Activity 6.3</p>	<p>3/2/07(A)</p>	<p>John Seabury</p>		
<p>6.8. Post approved and current construction authorization and safety documents at jobsites.</p> <p>Reinforce requirements to obtain signatures on all safety documents, and to display safety documents at jobsite.</p>		<p>PD&amp;C (Planning, Design, and Construction) Directive issued to explicitly require signatures on all safety documents, and posting of safety documents at the jobsite.</p>	<p>9/20/06(A)</p>	<p>Jerry O'hearn</p>		

<p><i>Corrective Action 6: Increase the rigor and consistency of the work planning and control processes (Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)</i></p>						
Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)	
<p>6.9. Streamline the penetration (dig) permit process.</p> <p>Revise the penetration permit process.</p>		<p>New Dig permit process "Permit to Penetrate Ground or Excavate Surfaces of LBNL Property" (Admin-053) published.</p> <p>Report on Effectiveness Assessment of new Dig Permit process</p>	<p>10/2/06(A)</p> <p>5/31/07</p>	<p>Michael Dong</p> <p>Richard Debusk</p>		
<p>6.10. Ensure that the documented process for operations and maintenance maintainability reviews of engineering drawings and specifications (prior to construction) is being followed.</p> <p>Develop formal process and implement as necessary.</p>		<p>Final report on review of process.</p> <p>Implementation of the required changes as a result of the review</p>	<p>9/30/07</p> <p>11/30/07</p>	<p>Michael Dong</p> <p>Michael Dong</p>		

**7.0 Corrective Action 7 - *Assure that the ISMS-related elements of LBNL-UCB relationship are consistently articulated and clearly understood (Guiding Principles 1 and 2)***

**Objectives**

The overall objective of this corrective action is to establish a more formal basis for assuring LBNL that the people doing work funded by LBNL in spaces controlled by UCB are afforded an equivalent level of protection from ES&H hazards posed by this work as would be provided if the work were conducted in space controlled by LBNL.

**Crucial Assumptions**

Crucial assumptions are: a) any processes developed and decisions made to achieve this objective are mutually acceptable to LBNL and UCB, b) any processes developed and decisions made will be in the context of the UCB/LBNL Partnership Agreement on EHS Policies and Procedures dated 3/15/04 as formally modified by UCB and LBNL.

**Major Activities**

Major activities underway include: a) regularly scheduled meetings of the Joint Research Collaboration Committee and the ES&H Sub-committee, b) regularly scheduled meetings between the directors of EH&S at both institutions to coordinate and resolve issues, c) Weekly meetings on the establishment of the new Energy Biosciences Institute at Calvin Hall on the UCB campus. Major activities planned include: a) developing a method for identifying and establishing an initial comprehensive list of locations where LBNL funded work is done and the individuals doing that work, b) developing an assurance process.

**Condition/Status as of 12/1/2007**

The status will be: 1) a decision will be made on whether to modify the Partnership Agreement in 2007, b) an initial list of locations and individuals will be developed, and c) a description of the assurance process will be completed.

**Final Closure**

Final closure of these actions is defined as having a comprehensive list of UCB locations and LBNL personnel performing work in such locations and having a process in place for assuring an equivalent level of protection for LBNL funded work in UCB spaces.

**Table 7 - CORRECTIVE ACTION 7**

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

**Corrective Action 7: Assure that the ISMS-related elements of LBNL-UCB relationship are consistently articulated and clearly understood (Guiding Principles 1 and 2)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p><b>7.1 Ensure institutional accountability for safety management and performance of LBNL funded work conducted in UCB-controlled spaces</b></p> <p>Through the UCB/LBNL Research Collaboration Committee, review the Partnership Agreement with UCB to clearly delineate and identify the scope of work for LBNL activities performed in UCB laboratories.</p>		<p>Form Joint Research Collaboration Committee and ES&amp;H Sub-committee.</p> <p>Joint decision to modify or not modify the Partnership Agreement in 2007</p>	<p>7/27/06(A)</p> <p>6/30/07</p>	<p>Howard Hatayama</p> <p>Howard Hatayama</p>	
<p><b>7.2 Ensure comprehensive identification of laboratory locations and individuals performing LBNL funded work in UCB-controlled spaces.</b></p> <p>Jointly develop an effective method for comprehensively identifying, and updating, laboratory locations and individuals performing LBNL funded work in UCB controlled spaces.</p> <p>Use the method developed above to identify locations and individuals and update this list annually.</p>		<p>Description of the method to be used.</p> <p>An initial listing of locations and individuals.</p>	<p>6/30/07</p> <p>8/31/07</p>	<p>Howard Hatayama</p> <p>Howard Hatayama</p>	

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity

**Corrective Action 7: Assure that the ISMS-related elements of LBNL-UCB relationship are consistently articulated and clearly understood (Guiding Principles 1 and 2)**

Major Activities	CATS ID	Outcome/Deliverable at Closure	Completion Date <sup>2</sup>	Responsible Person	Continuous Improvement Plan (CIP)
<p>7.3 Implement processes by which LBNL is assured that the UCB laboratories achieve "equivalent protection" for LBNL-funded work conducted in UCB-controlled spaces.</p> <p>Jointly develop a process that provides a basis for assurance that LBNL staff working in UCB space is afforded safety protection equivalent to that for comparable activities at LBNL.</p> <p>Implement process developed above.</p>		<p>A process description.</p> <p>Assurance process is in place.</p>	<p>8/31/07</p> <p>6/30/08</p>	<p>Howard Hatayama</p> <p>Howard Hatayama</p>	<p>Review the effectiveness of the assurance process annually.</p>

**APPENDIX A - ISM EVALUATION REPORT RECOMMENDATIONS**

**APPENDIX A ISM EVALUATION REPORT RECOMMENDATIONS**

Provided below is a prioritized set of recommendations from the ISM Evaluation Report. These recommendations are structured to reflect actions intended to have strategic impact on the ISMS at LBNL. The ISM Guiding Principles and Core Functions associated with each recommendation are indicated in parentheses.

**1. Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)**

- Assure that safety behaviors/expectations are clear, formal, understood, and implemented (see next recommendation)
- Assure that line management authority is unambiguous, universally understood, and accepted by emphasizing that
  - Line managers provide assurance and approval of all hazard analyses and work authorization documentation,
  - Safety leadership and safety performance expectations are explicitly communicated to – and understood by – line managers including PIs, and
  - Line managers actively involve workers in work planning.
- Assure that existing procedures are both fully understood and are being consistently followed; for example, promoting consistent and complete compliance with controls (PPE) identified in laboratory procedures and ensuring requirements are explicit.

**2. Restructure and refine institutional EHS/ISMS documents with the following focus and objectives (Guiding Principles 1, 2, and 5)**

- Clarify the hierarchy, functionality, and relationship among institutional documents (e.g., RPM, PUB-3000, Operating and Assurance Plan/Quality Assurance Plan, and Assurance Plan).
- Provide an overarching set of Laboratory safety values, principles, and expectations for individual position descriptions.
  - Articulate an overall statement of safety value for the Laboratory.
  - Define the highest level set of essential safety behaviors and expectations for line managers, subject matter experts, and staff in general.
  - Clarify expectations for Safety Liaisons.
  - Establish Laboratory-level training and qualification standards for Safety Coordinators.
- Establish an explicit process for translating new requirements into implementing practices.

- Codify the role of the Safety Review Committee in Laboratory procedure.
- Ensure process for translating new requirements into lower level procedures is codified.
- Ensure that process for identifying relevant industrial requirements is systematic, formalized, and understood.

**3. Increase the rigor of the performance management process (Core Function 5)**

- Enhance Laboratory-level processes through
  - Assuring performance objectives are derived from overarching EHS and operational end-state goals and objectives.
  - Assuring performance objectives form basis for monitoring organizational and functional performance.
  - Developing processes for monitoring and verifying the maturation of the systems, including (a) assuring that trending and analysis activities comprehensively examine performance data and provide a basis for improvements; and (b) assuring that OIA systematically evaluates performance of the Laboratory's assurance processes (e.g., Quality Assurance Program).
  - More thoroughly identifying, communicating, and taking advantage of the best practices that are in use in some divisions.
- Enhance functional and/or organizational processes through, for example –
  - Using a formal process to evaluate subcontractor and vendor safety performance.
  - Maintaining subcontractor and vendor safety performance records for use in future selections.
  - More consistently documenting and sharing worker feedback.

**4. Fully implement an integrated Corrective Action Management System, with the following objectives (Core Function 5)**

- Establish clear responsibilities for action ownership through the entire process.
- Provide enhanced guidance and functionalities for graded application of:
  - Preferred causal analysis tools and their application.
  - Triggers for – and methods used to conduct – extent-of-condition reviews.
  - Level of formality and methods used to verify action closure.
  - Triggers for – and methods used to conduct – effectiveness reviews.

- Monitor timeliness and system effectiveness in achieving its objectives.

**5. Strengthen Laboratory self-assessment processes (Core Function 5)**

- Structure the Division self-assessment process around Division-specific EHS and operational performance objectives that are aligned with institutional expectations.
- Incorporate expectations (methods, scope, etc.) associated with MESH reviews into Division self-assessments.
- Incorporate a prioritization process for identifying and conducting Division self-assessment activities based on mission objectives and evaluation of risks to the organization.
- Conduct institution-wide program evaluations (e.g., IFAs) on a risk-prioritized basis, which are designed to assure that program improvements are identified and the program is fully integrated with other systems.
- Provide assurance that these processes/programs are conducted effectively, are implemented properly, and result in identifiable improvements to performance (e.g., OIA function).

**6. Increase the rigor and consistency of the work planning and control processes, with the following focus and objectives (Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)**

***Research and Development***

- Reconsider, develop, and deploy minimum standards and expectations for allowing workers to interact with hazards before they have been fully qualified (including whether unsupervised work with certain hazards will be allowed, the level of supervision required, etc.).
- Re-examine the very high (as compared to other Laboratories) threshold of hazard that triggers the use of more formal hazard analysis and authorization.
- Develop effective and efficient ways to identify, communicate, and demonstrate control of lower risk/common hazards (e.g., routine use of chemicals, sharps, etc.).
- Establish an up-to-date SAD, a USI procedure, and a clear and widely known shielding policy for ionizing and non-ionizing radiation.

***Facilities and Operations***

- Establish a process to make sure workers are skilled in hazard recognition.

## **Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

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- Assure that hazard information is current by implementing the HEAR database upgrades.
  - Tailor Maximo-generated JHA checklists for specific crafts to improve relevancy and encourage use.
  - Post approved and current construction authorization and safety documents at jobsites.
  - Streamline the penetration (dig) permit process.
  - Ensure that the documented process for operations and maintenance maintainability reviews of engineering drawings and specifications (prior to construction) is being followed.
- 7. Assure that the ISMS-related elements of LBNL-UCB relationship are consistently articulated and clearly understood (Guiding Principles 1 and 2)**
- Ensure institutional accountability for safety management and performance of LBNL funded work conducted in UCB-controlled spaces.
  - Ensure comprehensive identification of laboratory locations and individuals performing LBNL funded work in UCB-controlled spaces.
  - Implement processes by which LBNL is assured that the UCB laboratories achieve “equivalent protection” for LBNL-funded work conducted in UCB-controlled spaces.

**APPENDIX B - CAUSAL FACTORS**

**APPENDIX B CAUSAL FACTORS**

The following table displays the Corrective Actions from the ISM Evaluation Report and their associated causal factors. These causal factors were derived from the analyses of LBNL's ISM system performed by the Peer Review team, the ISM Evaluation team, and LBNL during the course of calendar year 2006. These factors formed the basis for the corrective actions in this CAP.

<b>Corrective Actions</b>	<b>Causal Factors</b>
<p><i>Corrective Action 1</i>  <b><i>Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)</i></b></p>	<ul style="list-style-type: none"> <li>- Management's written and verbal safety communications program does not effectively communicate management concerns for quality workmanship, safety, and protection of the environment.</li> <li>- Line management accountability for enforcement of safety practices and procedures is less than adequate.</li> <li>- The need for training of line managers to effectively carry out their safety responsibilities has not been effectively analyzed.</li> <li>- Safety leadership and implementation of line management responsibilities for safety are highly variable across organizational units at LBNL.</li> <li>- Safety leadership by some PIs is lacking. There appear to be limited safety accountability feedback mechanisms for Post-Doctoral Scholars and Graduate Students</li> <li>- Weaknesses exist in working within established controls.</li> <li>- Workers are not consulted routinely in creating safety management systems and safety practices.</li> <li>- Workers do not appear to be involved in identification and management of hazards as part of many work planning activities.</li> </ul>

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Corrective Actions	Causal Factors
<p><b><i>Corrective Action 1</i></b>  <b><i>Re-emphasize expectations for line accountability and responsibility for safety; strengthen implementing processes to reflect these principles (Guiding Principles 1, 2, and 5)</i></b></p>	<ul style="list-style-type: none"> <li>- Risk taking is recognized, tolerated, and encouraged by workers, supervisors, coworkers, guests, and students.</li> <li>- Several instances were witnessed by or reported to the review team when safety requirements were not being rigorously followed.</li> <li>- Lab policies do not specify frequency of facility inspections and training of responsible is lacking.</li> <li>- Since PUB 3000 does not ensure uniform LBNL practices, divisions interpret authorizations processes.</li> <li>- The Laboratory does not have a policy in place requiring formal work planning and authorization for activities and work below LBNL regulatory thresholds.</li> <li>- Since PUB 3000 does not ensure uniform LBNL practices, divisions interpret authorizations processes.</li> <li>- PUB-3000 does not provide guidance for hazard assessment at a level to assure uniform practices site-wide.</li> <li>- Self-assessment inspection instructions and techniques require improvement (divisional, IFAs, MESH Reviews).</li> <li>- Elements of the SA processes applied at LBNL are not fully robust or rigorous in terms of effective measurement of organizational performance.</li> </ul>

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Corrective Actions	Causal Factors
<p><i>Corrective Action 2</i>  <i>Restructure and refine institutional EHS/ISMS documents with the following focus and objectives (Guiding Principles 1, 2, and 5)</i></p>	<ul style="list-style-type: none"> <li>- There does not appear to be a single, overarching set of Laboratory safety principles, behaviors, and expectations for individual position descriptions.</li> <li>- Institutional command media are not clear regarding the hierarchy and relationship among documents.</li> <li>- Standards, policies, and/or administrative controls (SPACs) lack detail, are confusing and incomplete, or do not exist. In addition, the SPACs in place are not strict enough or poorly enforced.</li> <li>- There are no clear roles, responsibilities, authorities, and accountabilities specified for selected individuals and/or positions.</li> <li>- Management's written and verbal statements program does not effectively communicate management concerns for quality, safety, and protection of the environment.</li> <li>- There is a significant difference among divisions in the safety culture and discipline of operations that is apparent in the performance of work.</li> <li>- The role of safety coordinators varies across LBNL. The minimum qualifications and training of safety coordinators is not determined and formalized.</li> <li>- The Laboratory does not have a consensus regarding the value of and specific expectations for Safety Liaisons.</li> <li>- It appears that elements of the process for translating new requirements into implementing practices is not formalized or completely understood.</li> </ul>

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Corrective Actions	Causal Factors
<p><i>Corrective Action 3</i>  <b>Increase the rigor of the performance management process (Core Function 5)</b></p>	<ul style="list-style-type: none"> <li>- Self-assessment is not aligned with institutional goals and objectives.</li> <li>- Self-assessment instructions and techniques require improvement.</li> <li>- Performance evaluation processes are not adequate. Technical review and division self-assessment are not fully effective.</li> <li>- Lessons learned and best practices are not effectively developed and communicated.</li> </ul>
<p><i>Corrective Action 4</i>  <b>Fully implement an integrated Corrective Action Management System, with the following objectives (Core Function 5)</b></p>	<ul style="list-style-type: none"> <li>- DOE Order 226.1 introduced several new requirements for issues management for which the Lab lacks adequate programmatic basis, support, and capabilities.</li> <li>- Issues Management Program roles and responsibilities are not well understood or consistently implemented.</li> <li>- IMP functions are not consistently executed.</li> <li>- IMP lacks a comprehensive policy document.</li> </ul>
<p><i>Corrective Action 5</i>  <b>Strengthen Laboratory self-assessment processes (Core Function 5)</b></p>	<ul style="list-style-type: none"> <li>- Self-assessment is not aligned with institutional goals and objectives</li> <li>- Self-assessment instructions and techniques require improvement:               <ul style="list-style-type: none"> <li>- Self-assessment is not risk-based</li> <li>- ESH assurance lacks robust, systematic review of program effectiveness.</li> </ul> </li> </ul>

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Corrective Actions	Causal Factors
<p><b><i>Corrective Action 6</i></b>  <b><i>Increase the rigor and consistency of the work planning and control processes, with the following focus and objectives (Guiding Principles 3, 5, 6, and 7; Core Functions 1, 2, and 5)</i></b></p>	<ul style="list-style-type: none"> <li>- LBNL has a number of work planning and control processes presently being used, but they could be better integrated and more inclusive of work at all levels.</li> <li>- The current work planning framework does not necessarily encourage needed discussion between workers and work leaders during the planning process.</li> <li>- While the existing Formal Authorization processes are generally accepted and work well for higher-level hazards, they do not specifically address work with lower hazards.</li> <li>- 10CFR851 has work planning and control requirements that closely parallel those issues identified by the ISM Evaluation Report.</li> <li>- Work planning and control must explicitly recognize that work must be authorized.</li> </ul>
<p><b><i>Corrective Action 7</i></b>  <b><i>Assure that the ISMS-related elements of LBNL-UCB relationship are consistently articulated and clearly understood (Guiding Principles 1 and 2)</i></b></p>	<ul style="list-style-type: none"> <li>- The UCB/LBNL Partnership Agreement concerning ES&amp;H appears to be well constructed and feasible to implement, consistent with the LBNL ISMS. However, there is a fundamental issue related to definitively identifying all work that falls under the agreement – it is not currently possible to clearly and explicitly identify all LBNL work that is being performed in UCB workspaces.</li> <li>- LBNL ES&amp;H assurance mechanisms such as Division Self-assessments generally do not address LBNL funded work in UCB controlled spaces.</li> </ul>

**APPENDIX C**

**CROSSWALK BETWEEN  
THE  
PEER REVIEW CORRECTIVE ACTIONS  
AND THE  
ISM EVALUATION REPORT CORRECTIVE ACTIONS**

APPENDIX C CROSSWALK BETWEEN THE PEER REVIEW CAP AND THE ISM EVALUATION REPORT CORRECTIVE ACTIONS

The following cross-walk was derived from a comparison of the PR root causes and the ISM Evaluation Report. This comparison revealed a strong correlation between all of the PR root causes and one or more of the seven Corrective Actions from the ISM Evaluation Report. Consequently, the PR corrective actions formed the basis for corrective actions in the ISM CAP. Some of the PR corrective actions have been completed as shown in the table below and are now considered to be part of the institutional program. The remaining actions are subsumed by this CAP.

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
1.1.3		Root Cause 1.1.3 - Line management accountability for enforcement of safety practices and procedures is less than adequate.	1/9/08	1, 2
1.1.3.01	a	Define line management and their roles and responsibilities in the appropriate section of the RPM.	9/29/06(A)	1, 2
1.1.3.02	b	Define safety roles and responsibilities for line management in Chapter 1 of PUB 3000.	9/29/06(A)	1, 2
1.1.3.03		Obtain SRC concurrence for policy changes to line management definition and roles and responsibilities.	10/13/06(A)	1, 2
1.1.3.04		Revise the current mandatory PRD ES&H evaluation criteria for managers to reflect changes in PUB 3000.	4/26/07	1, 2
1.1.3.04	a	Provide a template for Division ISM plans that will enable Divisions to upgrade ISM Plans to reflect changes in PUB 3000.	6/6/07	1, 2
1.1.3.04	b	Divisions develop ISM plans that will enable them to meet new guidance of PUB 3000.	4/27/07	1, 2

<sup>2</sup> (A) denotes the Actual Completion Date of a major activity  
3/30/2007

Integrated Safety Management System (ISM) Evaluation Corrective Action Plan

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
1.1.3.05		Revise the Division Self Assessment Criteria for 2007 to reflect new guidance in PUB 3000.	4/4/07	1, 2
1.1.3.06		Evaluate the effectiveness of the changes of PUB 3000 regarding roles and responsibilities for line management in the 2007 Division Self Assessment.	1/9/08	1, 2
2.1.1		Root Cause 2.1.1 - Not all EH&S Division technical programs include regular, required inspections of the workplace, work activities, or facilities.	6/19/08	5
2.1.1.01		Determine and document which efforts that are underway in support of 10 CFR 851 implementation address root cause 2.1.1 (e.g. one existing task is to "develop program validation methodology").	7/14/06(A)	5
2.1.1.02		Solicit and document feedback on existing instructions and techniques from Division Safety Coordinators and EH&S Liaisons.	6/16/06(A)	5
2.1.1.03		Survey EH&S Group Leaders/Technical Leads to determine baseline of EH&S assurance systems for technical programs.	7/5/06(A)	5
2.1.1.04		Catalog EH&S programs' assurance system: survey of GL/Technical Leads	7/5/06(A)	5
2.1.1.05		Develop Assurance Systems for EH&S Technical Programs.	6/20/07	5
2.1.1.06		Document enhanced and/or newly develop EH&S Technical Program Assurance Systems, ES&H Self Assessment Program, PUB 5344.	7/19/07	5
2.1.1.07		Validate effectiveness of enhanced / newly developed EH&S Technical Program assurance systems.	6/19/08	5
2.1.2		Root Cause 2.1.2 - Self-assessment inspection instructions and techniques require improvement.	5/25/07	1,3,5,7
2.1.2.01		Solicit and document feedback on existing instructions and techniques and on January walk-throughs from Division Safety Coordinators and EH&S Liaisons.	6/16/06(A)	1,3,5,7
2.1.2.02		Compile lessons learned (including noteworthy practices) on January 2006 walk-throughs.	6/23/06(A)	1,3,5,7

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
2.1.2.03		Determine requirements for additional documents, as required.	7/21/06(A)	1,3,5,7
2.1.2.04		Determine requirements for training, as deemed necessary.	7/21/06(A)	1,3,5,7
2.1.2.05		Incorporate feedback and results from actions 1-3 into the following documents and training.	10/18/06(A)	1,3,5,7
	a	Environment, Safety, and Health Self Assessment Program, PUB-5344.	9/14/06(A)	1,3,5,7
	b	Tools and procedures for conducting Division ES&H Self-Appraisals, PUB-3105.	3/28/07	1,3,5,7
	c	ES&H Self-Assessment Training.	10/18/06(A)	1,3,5,7
2.1.2.06		Develop additional training as appropriate.	12/22/06(A)	1,3,5,7
2.1.2.07		Revise IFA and MESH protocols for FY06.	5/24/06(A)	1,3,5,7
2.1.2.08		Assess effectiveness of revised IFA and MESH protocols.	3/13/07	1,3,5,7
2.1.2.09		Revise division self-assessment criteria based on Lab policy.	2/20/07	1,3,5,7
2.1.2.10		Revise Partnership Agreement between LBNL and UCB, ensuring consistency with Lab policy.	5/25/07	1,3,5,7
3.1.1		Root Causes 3.1.1 - The need for training of line managers to effectively carry out their safety oversight responsibilities has not been effectively analyzed.	12/7/07	1
3.1.1.02	a	Establish the need, scope, requirements of line manager safety oversight training.	11/10/06(A)	1
	b	Perform a Gap Analysis on oversight training requirements. Document Findings.	11/10/06(A)	1
	c	Review existing LBNL policy regarding line manager safety oversight training requirements and revise training as required.	12/18/06(A)	1
	d	Establish training course evaluation process that measures the effectiveness and quality of not only each class taught but periodically of the course /program.	5/9/07	1
	e	Establish retraining/refresher training interval criteria for safety training courses.	6/7/07	1
	f	Develop training schedule. Train new and exiting staff as required.	12/7/07	1

Integrated Safety Management System (ISM) Evaluation Corrective Action Plan

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
3.1.2		Root Cause 3.1.2 - The role of safety coordinator varies across LBNL. The minimum qualifications and training of safety coordinators is not determined and formalized.	8/2/07	2
3.1.2.01		Determine and formalize roles and responsibilities for safety coordinators across LBNL. Update Pub 3000.	10/20/06(A)	2
3.1.2.02	a	Review qualifications of all safety coordinators against new requirements.	1/23/07(A)	2
	b	Analyze, determine and formalize minimum training for safety coordinators.	1/2/07(A)	2
	c	Develop training course(s) for Safety Coordinators.	3/9/07(A)	2
	d	Initiate training for all coordinators (as necessary).	5/10/07	2
	e	Review effectiveness of training and recommend changes as necessary.	8/2/07	2
3.2.1		Root Cause 3.2.1-Workers may be taking risks greater than what is expected.	2/28/07(A)	6
3.2.1.03		Perform a survey on the safety culture at Berkeley Lab and report results to Lab Management and employees.	1/12/07(A)	6
3.2.1.04		Revise institutional ISM Plan and Division ISM Plans to define and discourage excessive risk taking. Define and compare types of risks (safety risks versus research program risks).	2/28/07(A)	6
3.2.2		Root Cause 3.2.2 - Risk taking is recognized, tolerated, and encouraged by workers, supervisors, coworkers, guests and students.	12/3/07	1
3.2.2.02		Issue a memo from the Directorate that defines types of risks and discourages excessive risk taking in safety.	8/16/06(A)	1
3.2.2.03		Add requirements for safety communications to Performance Review and Development forms.	3/26/07(A)	1
3.2.2.04		Perform a survey on the safety culture at Berkeley Lab and report results to Lab Management and employees.	12/3/07	1

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
3.2.4		Root Cause 3.2.4 - Work control processes are less than adequate when scope, resources, personnel, schedule change.	1/7/08	6
3.2.4.01		Develop a system to identify people who perform work under a formal authorization.	7/3/07	6
3.2.4.02		Develop procurement policies and procedures for tagging new acquisitions.	7/3/07	6
3.2.4.03		Present proposed system to SRC.	7/19/07	6
3.2.4.04		Use feedback from the SRC and other sources to guide the development of a system that manages changes in scope, resources, personnel and schedule that is graded to the level of authorization and can be effectively implemented.	11/26/07	6
3.2.4.05		Publish new policies and procedures in PUB 3000.	1/7/08	6
3.3.1		Root Cause 3.3.1 - Root Cause analysis may be inadequate due to training inadequacies.	9/28/06(A)	4
3.3.1.01		Revise incident investigation procedures.	9/1/06(A)	4
3.3.1.02		Provide Tap Root and training to incident investigators.	8/31/06(A)	4
3.3.1.03		Provide incident investigation training to Division Safety Coordinators and EH&S Liaisons.	9/1/06(A)	4
3.3.1.04		Revise investigator training to minimize stress to individuals under investigation.	9/28/06(A)	4
4.1.1		Root Cause 4.1.1 - Management's written and verbal safety communications program does not effectively communicate management concerns for quality workmanship, safety, and protection of the environment.	9/29/06(A)	1, 3
4.1.1.01	a	Review and evaluate existing management safety communications plan.	7/31/06(A)	1, 3
	b	Initiate and verify or establish new requirements for the management safety communications plan.	9/15/06(A)	1, 3
	c	Develop/ revise management safety communications plan.	9/29/06(A)	1, 3

Integrated Safety Management System (ISMS) Evaluation Corrective Action Plan

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
4.2.1		Root Cause 4.2.1 - Management safety communications are not consistently focused on lessons learned from accident/ incident investigations.	9/1/06(A)	3
4.2.1.02		Implement enhanced Lessons Learned program to accept near misses.	9/1/06(A)	3
4.2.1.03		Institute routine periodic memo from upper management to employees on EH&S issues	8/1/06(A)	3
5.1.1		Root Cause 5.1.1 - The Laboratory does not have a policy in place requiring formal work planning and authorization for activities and work below LBNL regulatory threshold.	9/28/07	1, 6
5.1.1.01		Form a Team of Line Managers, Division Safety Coordinators and EH&S liaisons to develop methods to formalize and document "line management authorization" of work.	12/15/06(A)	1, 6
5.1.1.02		Develop a proposal for presentation to the SRC.	1/23/07(A)	1, 6
5.1.1.03		Incorporate feedback from the SRC, DSCs and Liaisons and develop a policy on review and documentation for line management authorization of work.	2/6/07(A)	1, 6
5.1.1.04		Integrate the approved methodology into PUB 3000.	5/17/07	1, 6
5.1.1.05		Develop appropriate training/ communication as needed.	9/28/07	1, 6
5.1.1.06		Develop appropriate validation during the 2007 Self Assessment.	9/28/07	1, 6
5.1.2		Root Cause 5.1.2 - The current policy and implementation guidance for AHDs lacks specificity.	12/21/07	6
5.1.2.01		Transition all AHDs to the electronic AHD system.	12/21/07	6
5.1.2.02		Evaluate the need to include SME review for non-laser AHDs and incorporate results in the Pub 3000.	12/22/06(A)	6
5.1.2.03		Evaluate and develop the on-line technical support and/or training for AHD-preparers and adjust or enhance the training as necessary.	9/28/07	6
5.1.2.04		Complete a review of all policies relating to AHD.	12/5/07	6

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
5.1.2.05		Collect and review feedback from the 2006 IFA pertaining to the formal authorization program.	4/23/07	6
5.1.2.06		Propose new formal authorization policies and guidelines to the SRC. (If Needed).	9/28/07	6
5.1.2.07		Publish the final policy revision in Pub3000.	10/31/07	6
5.1.2.08		Evaluate implementation of policy revision. Publish final policy.	12/21/07	6
5.1.3/7.1.2		Root Cause 5.1.3 and 7.1.2 - Adherence to the existing work control program including the current assessment and performance evaluation processes for work authorizations, particularly AHDs is less than adequate.	6/29/07	3, 5
5.1.3/7.1.2.0		Communication by managers of the requirement and the value of compliance with work controls needs reinforcement.	3/27/07(A)	3,5
5.1.3/7.1.2.01		Revise IFA guidance to focus on formally authorized work in the assessed division.	5/22/06(A)	3,5
5.1.3/7.1.2.02		Solicit feedback from Group Leaders and Division Safety Coordinators to determine merits of liaisons performing IFAs of other divisions.	7/5/06(A)	3,5
5.1.3/7.1.2.03		Provide input for AHD database upgrades to enhance Division Self-Assessment validation process.	7/10/06(A)	3,5
5.1.3/7.1.2.04		Review the results of the 2005 and 2006 IFAs and MESH reviews to identify aspects of the work control that are not being effectively implemented.	6/29/07	3,5
5.1.3/7.1.2.05		Incorporate recommendations from Root Cause 5.1.3/7.1.2.03 above in AHD database.	4/30/07	3,5
5.1.3/7.1.2.06		Develop a plan to improve training of individuals responsible for formal authorization documents and the communication of formal authorization requirements to staff and students.	11/3/06(A)	3,5
5.1.3/7.1.2.07		Present Plan and database changes to the SRC for concurrence and initiate.	6/29/07	3,5
5.3.1		Root Cause 5.3.1 - Work and hazard identification for projects/ maintenance-type work and activities is less than adequate.	1/2/08	6

**Integrated Safety Management System (ISMD) Evaluation Corrective Action Plan**

Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
5.3.1.01		Evaluate existing policies governing hazard identification and oversight work performed by the Facilities Division.	1/31/07(A)	6
5.3.1.02		Evaluate existing policies governing hazard identification and review for work performed by construction sub-contractors.	4/25/07	6
5.3.1.03		Evaluate existing policies governing hazard identification and oversight for work performed by equipment vendors.	5/30/07	6
5.3.1.04		Develop a proposal for hazard assessment and planning for these work classes and present this to the SRC.	7/27/07	6
5.3.1.05		Incorporate feedback from Line Managers/SRC, DSCs and Liaisons and develop a policy on review and documentation for these categories of work.	8/23/07	6
5.3.1.06		Integrate the approved methodology into PUB3000.	9/21/07	6
5.3.1.07		Develop additional training/communication.	10/22/07	6
5.3.1.08		Review and evaluate effectiveness during the 2007 Self Assessment.	12/21/07	6
5.3.1.09		Revise Division Self-Assessment to validate effectiveness.	1/2/08	6
5.3.1.10		Implement review process (External to Subject Division) for this element.	1/2/08	6
6.3.1		Root Cause 6.3.1 - Lab policies do not specify frequency of facility inspections and training of those responsible is lacking. Lab policies do not specify frequency of facility inspections and training of those responsible is lacking.	4/20/07	1
6.3.1.01		Revise the requirement for management walk-arounds in Chapter 1 of PUB 3000.	12/15/06(A)	1
6.3.1.02		Develop and deliver safety walk-around training (EHS-27).	6/29/06(A)	1
6.3.1.03		Assess effectiveness of safety walk-arounds and present results to the SRC.	12/15/06(A)	1
6.3.1.04		The SRC will review the effectiveness of improvements in line management walk-arounds (including the effectiveness of EHS-27) and direct additional actions as needed.	4/20/07	1

**Integrated Safety Management System (ISM) Evaluation Corrective Action Plan**

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Root Cause #	sub	CAP Description	Completion Date <sup>2</sup>	ISM Evaluation Report Corrective Actions
7.1.3		Root Cause 7.1.3 - Corrective actions to address inconsistent adherence to work planning and authorization policies are often delayed due to non-identification of task master.	5/19/06(A)	4
7.1.3.02		Developed Corrective Action Tracking System (CATS).	5/19/06(A)	4

**APPENDIX D - GLOSSARY**

**APPENDIX D GLOSSARY**

**Activity Hazards Analysis (AHA):** An analysis of activities for new facilities design or modifications to existing ones, operations and procedures, equipment, product and services. Impacts from exposure to chemical, physical, biological, or ergonomic hazards must be accomplished through the hazards analysis and exposure monitoring activities. One type of Activity hazards analysis is the Job Hazards Analysis. AHAs should be conducted during the planning stage for new operations and procedures, as well as prior to implementation of changes to existing operations and procedures.

**Activity Hazards Document (AHD):** A safety document that identifies hazards and describes mitigation. It is the Laboratory document used to describe the controls necessary to ensure that the risks associated with a potentially hazardous research project or unique activity are at an acceptable level.

**Corrective Action Tracking System (CATS):** The CATS database tracks findings and corrective actions from internal (e.g., self-assessments and internal audits) and external reviews (e.g., DOE reviews, regulatory agency audits, and peer reviews) at the Laboratory. The purpose is to manage findings in a consistent manner to promote performance improvement, prevent recurrence of unwanted conditions, and facilitate trending and analysis. All Lab staff can input data and track findings and corrective actions.

**Hazard, Equipment, Authorization, and Review (HEAR):** A Web-based database that allows division users direct access to information relevant to the evaluation and identification of hazards and areas of risk associated with their operations. The emphasis is on division-user maintenance and use of the data. The HEAR system is part of the framework for institutional hazard and risk analysis.

**Higher Education Employer-Employee Relations Act (HEERA):** The Act outlines certain rules that LBNL must follow. It is the state law defining the relationship between the University, its employees and their unions. Many of the University's personnel policies refer to HEERA and it is the guiding principal behind the collective bargaining of all of the union contracts. HEERA is also the law that the California Public Employee Relations Board (PERB) uses to decide on Unfair Labor Practice (ULP) disputes between the University and its employees.

**Integrated Functional Appraisals:** The objective of the IFA portion of the Self-Assessment Program is to conduct an ES&H technical review of division work activities and operations. The primary focus of the IFA is with operations with increased hazards that require formal authorizations. In the context of ISM principles, the IFA emphasizes the adequacy of authorizations, the effective and efficient tailoring of controls to hazards, the appropriate balance of research and safety priorities, and the applicability of standards and requirements. An additional objective of the IFA is to assure that the appropriate consensus standards and regulatory requirements governing division work activities are included in the Laboratory's prime contract. IFA will be replaced by the Technical Assurance Program in FY2007.

**Issues Management Program (IMP):** A comprehensive planning and continuous improvement tool that identifies and controls performance and safety deficiencies, tracks associated corrective actions to resolution, and analyzes data in order to determine effectiveness of implemented corrective actions and prevent recurrence of issues.

**Integrated Safety Management (ISM):** ISM establishes LBNL's commitment to work safely, in a manner that strives for the highest degree of protection for everyone who works at the Berkeley Lab. It holds that every member of the Lab community will be assured of a more healthful and safe environment if the principles of ISM are supported and observed by everyone, including contractors and visitors. They must be familiar with all environment, health, and safety requirements generally applicable to everyone who works at the Berkeley Lab, and must know the hazards in the assigned work area, the level of protection required, specific safe work practices, and applicable health and safety requirements. It is an LBNL expectation that all employees, contractors, and visitors adhere to the ISM principles and functions and implement them into all work activities.

**Job Hazards Analysis (JHA):** A JHA involves a breakdown of work tasks and assessment of the hazards associated with each step of a work task. A JHA contains the following elements:

- a. A description of the Work to which the JHA applies (the Scope).
- b. Descriptions of
  - i. The tasks incorporated into that Work;
  - ii. The hazards associated with those tasks; and
  - iii. The controls required to mitigate those hazards, using exposure assessment as necessary to evaluate exposures and controls.
- c. Signatures of the Work Lead authorizing the Work (as analyzed by the JHA and mitigated by the controls), and of the Worker indicating concurrence.
- d. A duration for which the JHA authorizes the work. The maximum duration of a JHA is one year from the date of the Work Lead's authorizing signature.

**Job Hazards Questionnaire (JHQ):** JHQ is a major component of EH&S web based training database that asks questions about Lab employees working environment and activities for the purpose of noting the safety and health hazards an employee is likely to encounter in the course of his/her work at the Laboratory. The information collected through the questionnaires will result in identification of appropriate training requirements and recommendations that will allow the employee to operate more safely at the Laboratory. The database generates reports on the employee's EH&S training status, responds to request for course credit, and establishes training groups based on needs. JHQ is administered to all new Lab employees and upon job changes.

**Line Managers:** Line managers are individuals responsible for formulating and administering policies and programs of the Laboratory; collectively, they are the Line Management. Typically, this includes some level of responsibility for staffing, performance review, Work direction and evaluation, and/or finance. The formal "chain of command" management structure at LBNL starts at the top with the Laboratory Director, and ends with Supervisors or Matrix Supervisors. Examples include but are not limited to program heads, group leaders, department heads, division deputies, superintendents, administrators, supervisors, etc.

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**Matrix Supervisor:** A Matrix Supervisor is responsible for providing day-to-day technical direction and oversight, including responsibilities for proper execution of ES&H activities of Employees and Guests within their purview. A Matrix Supervisor is required to be HEERA-designated and can be in a division separate from the Employee's home division. The Matrix Supervisor can act as the Host and point of contact on behalf of the division for Guests and visitors of the Laboratory. A Matrix Supervisor partners with the HEERA Supervisor on matters of staffing, performance review, Work direction, and/or evaluation.

**MAXIMO:** Enterprise Operations and Asset Management System: MAXIMO is a computerized asset maintenance system that helps optimize the return on assets. MAXIMO stores data about LBNL, and helps organize that data and simplify the following activities:

- Cost analysis
- Assessment of equipment status
- Management of inventory and labor resources
- Planning of maintenance activities

**Management of Environment, Safety, and Health (MESH):** The objective of an MESH review is to evaluate a division's management of environment, safety, and health in its operations and/or research, focusing on the implementation and effectiveness of the Division's Integrated Safety Management (ISM) Plan. These reviews are designed to ensure management systems consistent with are in place in all Laboratory Divisions and that these systems are leading to effective implementation of the Laboratory's ES&H program. MESH reviews are triennial by division and are conducted by a Safety Review Committee sub-committee. All members of the SRC are expected to serve on MESH sub-committees.

**Operating and Assurance Plan:** The Berkeley Lab Operating and Assurance Plan (OAP) is a set of operating principles, requirements, and practices used to support Berkeley Lab organizations in achieving reliable, safe, and quality performance in their work activities. The OAP is designed to integrate quality assurance, safety management, and conduct of operations into Laboratory operations. It provides the framework for Berkeley Lab administrators, managers, supervisors, and staff to plan, manage, perform, and assess their Laboratory work. It is the compliance document that conforms to the requirements of the Laboratory's Work Smart Standards for quality assurance (DOE O 414.1, 10 CFR 830.120), facility operations (DOE O 5480.19), and safety management (DOE P 450.4). The OAP is applicable to all Berkeley Lab organizations.

**Performance Evaluation Management Plan (PEMP):** The PEMP is required under the DOE *Standards of Contractor Performance*. Pursuant to the contract, BSO, LBNL, and UCOP representatives will review the PEMP annually and agree to necessary modifications. The plan needs to contain a general overarching statement of the desired outcome for each of eight major performance areas prescribed by the DOE Office of Science:

1. Mission Accomplishment
2. Research Facilities
3. Research Management
4. Lab Leadership

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5. Environment, Safety, & Health
6. Business Systems and Other
7. Facilities Infrastructure
8. Safeguards & Security/Emergency Management.

**Performance Review Document (PRD):** The PRD is the document used by managers and supervisors to facilitate the annual performance appraisal process as well as probationary reviews for eligible newly hired employees. The Laboratory's annual performance review period is July 1st through June 30th. The Laboratory reinforces the importance of employees receiving performance reviews that provide strong, clear, and concise feedback on their accomplishments for the performance year. The PRD form serves as a tool for managers to evaluate the performance of each employee against the expectations of their position. It will also include well-defined goals and objectives for the upcoming year as well as employee developmental plans.

**PUB 3000:** The Environment, Health and Safety Manual at the Lawrence Berkeley National Laboratory.

**Radiological Work Permit (RWP):** A permit that identifies radiological conditions, establishes worker protection and monitoring requirements, and contains specific approvals for specific radiological work activities. The Radiological Work Permit serves as an administrative process for planning and controlling radiological work and informing the worker of the radiological conditions. A permit for construction or demolition work in a Radiological Material Area is one example.

**Radiological Work Training (RWT):** Graded training requirements based on exposure potential and responsibility of the x-ray user. Classifications, in descending order of responsibility, are:

- \* X-Ray System Supervisor
- \* X-Ray System Use Instructor
- \* X-Ray Service Personnel
- \* X-Ray Users Authorized for Override Operations  
(above are referred to as X-Ray Radiation Workers.)
- \* Routine Users (must receive On the Job Training (OJT) and General Employee Radiological Training (GERT) every two years.

**Regulations and Procedures Manual:** A manual that provides Laboratory personnel with a reference to University and Lawrence Berkeley National Laboratory policies and regulations by outlining the normal practices and answering most policy questions that arise in the day-to-day operations of Laboratory departments. Much of the information in this manual has been condensed from detail provided in Laboratory procedure manuals, Department of Energy (DOE) directives, and Contract DE-AC02-05CH11231. It is not intended to replace any of those documents. The sections on personnel apply only to employees who are not represented by unions. Personnel policies pertaining to employees represented by unions may be found in their labor agreements.

## Integrated Safety Management System (ISM) Evaluation Corrective Action Plan

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**Safety Coordinators:** Division Safety Coordinators (DSCs) are the primary contact person for all EH&S activities for their assigned departments. The DSC is responsible for conducting laboratory inspections, reviewing safety equipment, and assist researchers in safety related issues. DSCs report directly to their division director or deputy and are responsible for administering the division's ES&H program.

**Safety Liaisons:** EH&S Division Liaisons (primary and associate) are designated for each Laboratory organization. These individuals are considered the primary points of contact between a customer division (typically via the Division Safety Coordinator) and the EH&S division and function as the troubleshooter and problem resolution facilitator. This relationship does not preclude any Laboratory employee from directly approaching an EH&S professional/subject matter expert to address a particular issue or need.

**Safety Line Management:** The unbroken linear safety management chain from the Laboratory Director to each Worker. Above the lowest organizational unit in each division, the chain is defined by the succession of direct reports that establish job assignments, appraise performance, and determine salaries. Below this level, the chain can include Workers at any level, and may include non-management Work Leads who guide the day-to-day activities of one or more Workers.

**Safety Performance Assessment (SPA):** A system that assesses safety expectation and performance of Safety Line Managers and staff not covered by HEERA. It utilizes the enhanced PRD process used by HEERA-defined managers and supervisors.

**Safety Review Committee (SRC):** The Committee performs research for and makes recommendations to the Laboratory Director on the development and implementation of Environment, Safety & Health (ES&H) policy, guidelines, codes and regulatory interpretation. It conducts reviews of special safety problems and provides recommendations for possible solutions if requested to do so by the Laboratory Director. The SRC also provides advice and counsel to the Laboratory Deputy for Operations by reviewing appeals from the Laboratory Divisions when any Division and the Environment, Health & Safety (EH&S) Division do not agree on the interpretation or application of criteria, rules or procedures. Such advice and counsel may include options for a resolution. The SRC chair, in cooperation with the Office of Assessment & Assurance (OAA), is responsible for scheduling and conducting the portion of institutional self-assessment known as Management Environment, Safety & Health (MESH) reviews.

**Self Assessment Program:** LBNL's ES&H Self-Assessment Program (also referred to as the Self-Assessment Program) provides the mechanism for assuring that ISM is fully implemented and effective at all levels of Laboratory activities and operations. The Self-Assessment Program is a formal, internal process used to evaluate ES&H programs, policies, and processes. The process is designed to ensure that Laboratory work is conducted safely, and with minimal adverse effects to workers (employees, participating guests, and subcontractors), the public, and the environment. The Self-Assessment Program is also the mechanism used to institute continuous improvements to the Laboratory's ES&H programs.

**Spot Awards:** The purpose of the SPOT Recognition Award program is to acknowledge and reward outstanding individual and/or team workplace contributions that occur on a day-to-day basis. Contributions should impact the quality, cost, service, safety, or resource utilization of an organizational unit, team, or department. Additionally, the Environment, Health and Safety Division (EHS) sponsors a Safety SPOT Recognition Program. All active employees and UC faculty members who have joint appointments between the Lab and a UC campus are eligible to participate in the SPOT Recognition Award Program.

**Supervisor (HEERA):** Supervisory Employees are defined by the Higher Education Employer-Employee Relations Act (HEERA) as "any individual, regardless of the job description or title, having authority in the interest of the employer to hire, transfer, suspend, lay off, recall, promote, discharge, assign, reward or discipline other employees, or responsibility to direct them, or to adjust their grievances, or to effectively recommend such action, if, in connection with the foregoing, the exercise of such authority is not of a merely routine or clerical nature, but requires the use of independent judgment. . . . Employees whose duties are substantially similar to those of their subordinates shall not be considered to be supervisory employees."

**Subcontractor:** is a firm that has sole contractual responsibility for execution of the construction work related to a project, and for compliance with all safety, health, and environmental codes, standards, and regulations.

**Technical Assurance Program:** ES&H Technical Assurance is one of three internal forms of ES&H self-assessment, the others being Division Self-Assessment and the MESH review. Primary elements of ESH Technical Assurance are:

- Formal authorization compliance
- Regulatory assurance requirements
- Program effectiveness
- Corrective action trending and analysis
- Lessons learned implementation

**Unreviewed Safety Issues (USI):** An Unreviewed Safety Issue (USI) exists if a proposed change, modification or experiment will either: (1) Significantly increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety from that evaluated previously by safety analysis; or, (2) Introduce an accident or malfunction of a different type than any evaluated previously by safety analysis that could result in significant consequences.

**Walk Around:** The safety walk around demonstrates management leadership and helps ensure that we work safely and avoid injury. A walk around includes, but not limited to, any, some, or all of the following aspects of a worker: ergonomics, environment, procedures, tools, traffic, at-risk behaviors, personal protective equipment, etc.

## Integrated Safety Management System (ISM) Evaluation Corrective Action Plan

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**Work Lead:** A Work Lead is anyone who directs, trains, and/or oversees the Work and activities of one or more Workers. Work Leads provide instruction on working safely and the precautions necessary to use equipment and facilities safely and effectively. Work Leads need not be Line Managers, HEERA-designated Supervisors, or LBNL Employees.

**Workers Observing Workers (WOW):** It is a process based on the Behavioral Accident Prevention Process (BAPP®) approach to safety. This is a worker driven process whose goal is to increase awareness of at-risk situations and remove barriers that would prevent workers from performing their work safely. Since the measurement is on behavior (as opposed to accidents), actions can be taken to remove the risk before an accident happens. By identifying behaviors and situations that are putting workers at-risk, the process provide data that allow for the development of solutions through *action plans* to reduce or eliminate risks that contribute to accidents. A vast amount of worker involvement is required for this process to operate efficiently. The purpose of the process is to reduce accidents and injuries through applying the principles of behavior observation and positive feedback, thereby creating a work culture committed to an accident-free workplace.

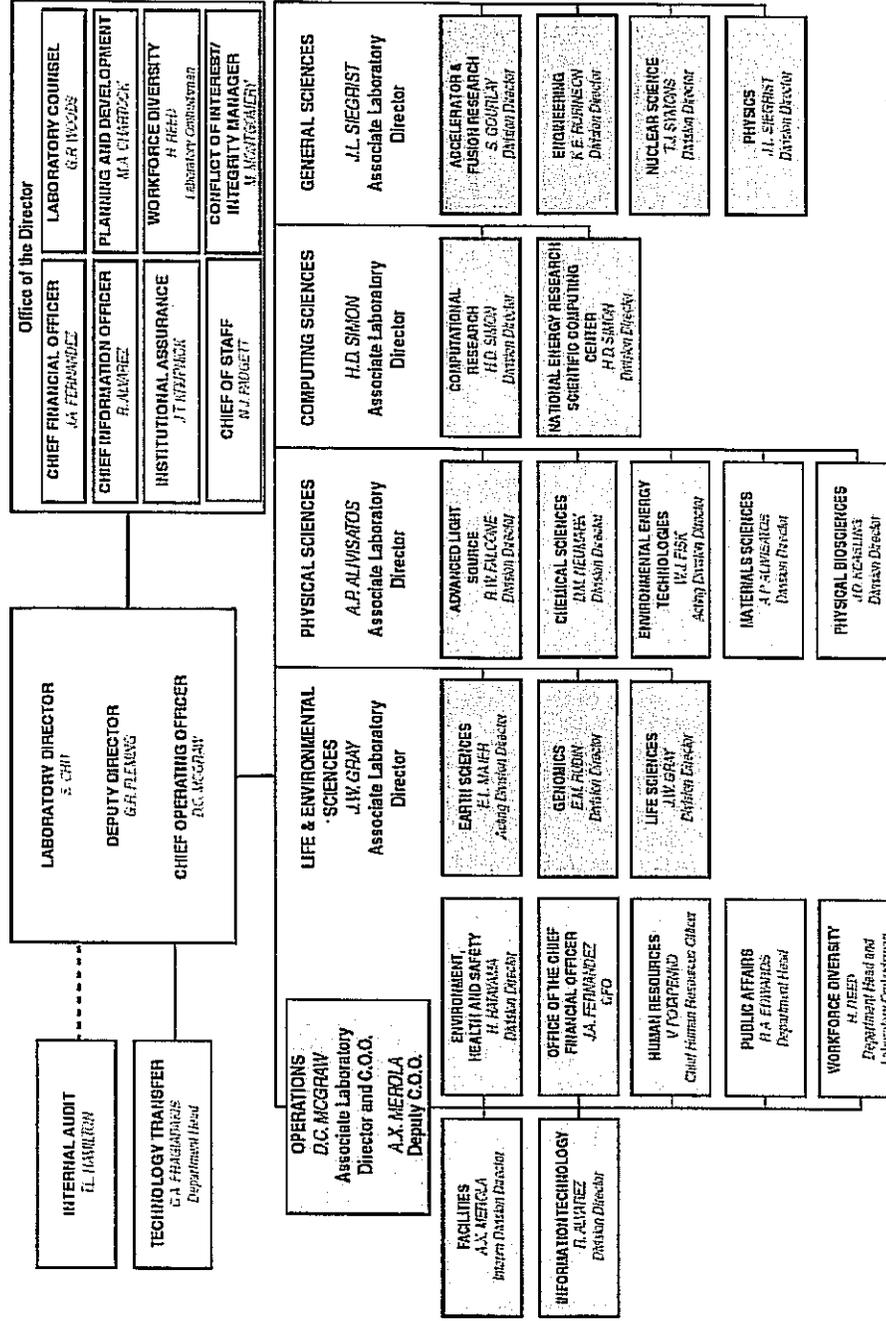
**Work Request Center (WRC):** The Work Request Center expedites facility-related work requests, answers questions, and provides support for facility-related needs.

**Work Smart Standards (WSS):** A Work Smart set of standards is the principal product of a successful Necessary and Sufficient Closure Process (N&S) application within the context of the Integrated Safety Management System (ISMS) A WSS set includes all applicable federal, state, and local laws and regulations as well as other standards that are necessary and sufficient to provide adequate protection for workers, the public, and the environment. The set must also be feasible for implementation, meaning that it can be implemented within expected resource and time constraints. The work of identifying standards is carried out by the Identification Team, operating within the protocols and documentation requirements previously established.

**APPENDIX E - ORGANIZATION CHART  
LAWRENCE BERKELEY NATIONAL LABORATORY**

APPENDIX E LBNL ORGANIZATION CHART

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY • UNIVERSITY OF CALIFORNIA



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