PEER REVIEW/BACKLOOK ISSUES

ROOT CAUSE ANALYSIS

April 25, 2006

Principle 1 – Line Management Responsibilities for Safety:
Line Management is directly responsible for the protection of the public, the workers, and the environment.

Issue 1.1: Line Management's execution of ES&H is less than adequate.

Root Cause 1.1.1 – Standards, policies and/or administrative controls (SPAC) lack detail, are confusing and incomplete, or do not exist. In addition, the SPACs in place are not strict enough and poorly enforced.

A latent safety management issue appears to underlie effective line management implementation of workplace safety. Workplace safety requires proactive involvement by line managers. They are responsible for communicating and demonstrating by example the principles and five core functions of ISM work activities and facility operations. A basic weakness noted was the finding that confusion exists throughout the Laboratory with respect to the title of "line manager." The term line manager is not well understood and is not defined in the Laboratory's RPM. Consequently, line management position descriptions are not consistent across the Laboratory and the understanding of line management expectations is not clear.

Periodic walk-arounds are an essential part of line manager's responsibilities in implementing safety. Senior management walk-arounds are spotty and vary from once a year to twice a day. The institutional expectation is that senior managers inspect all of their workspaces annually, but is not defined in any Lab policy as a requirement. In any case, annually is insufficient oversight for many work activities. Discussions with the workforce confirm that the presence of senior management in the workplace has a positive impact, reinforcing the premise that management is interested in them and their safety.

Root Cause 1.1.2 – The need for training of line managers to effectively carry out their safety oversight responsibilities has not been effectively analyzed. The lack of presenting a convincing analysis of the need for this training led in part to a senior management decision to not make such training a laboratory-wide requirement.

The Peer Review report notes that Principal Investigators do not appear to be well trained and prepared for their line management responsibilities. As noted in Root Cause 3.1.1, line managers are not formally trained to conduct meaningful safety walk-arounds.

Root Cause 1.1.3 – Line management accountability for implementation of existing policies and administrative controls has been inadequate, resulting in deviations in implementation or non-use of standard-based safety requirements. The need for adherence to and communication of safety policies and procedures down the management line is less than adequate. There is evidence that the senior management support of middle and first line supervisors for doing work safely is not consistent and in some groups support is less than adequate.

Common comments from the staff were: safety management is not a high priority for many PIs, and formal communications, designed to make ISM real for workers and researchers, could be improved. Another major contributing factor to poor communication of safety issues is the relationship between principal investigator and post docs and graduate students. Post docs and graduate students are dependent on the recommendations from their PIs for future career opportunities. This relationship deters identification of safety issues and implementation of work place safety.

Lack of accountability contributes to less than adequate adherence to safety policies and administrative controls. Inadequate safety performance expectations were noted as a major contributing factor to an overall weakness in line management implementation and oversight of work place safety. Based upon a random sampling of performance review documents (PRDs), the majority of comments regarding ES&H performance was perfunctory and contained few qualitative measures. This was contrasted to the rigorous and detailed comments on technical and scientific performance. The Backlook review amplified this observation noting that not all PIs are equal with respect to responsibility for and performance of safety management.

The practice of principal investigators having 20-60 post docs and graduate students on a project is seen as a major contributing factor to weakness in the implementation and enforcement of safety at the activity level. This issue was noted in the Peer Review as: the span of control for a principal investigator can exceed what is easily manageable making it even more difficult to monitor their spaces and activities and by the Backlook Review as: span of control (excessive) does not allow responsible safety management (see Issue 4.4).

Inadequate participation by EH&S professions in monitoring field and work place activities contributes to lenient and inconsistent implementation of the existing safety policies (see Issue 2.1.1).

Principle 2 – Clear Roles and Responsibilities:
Clear and ambiguous lines of authority and responsibility for ensuring safety shall be established and maintained at all organizational levels within the department and its contractors.

Issue 2.1 ES&H Assurance mechanisms are ineffective.

Root Cause 2.1.1 – Not all EH&S Division technical programs include regular, required inspections of the workplace, work activities, or facilities.

The EH&S Division does not have a mechanism for regular inspections to assess programmatic effectiveness. For example, due to the requirements of 10CFR 835, the Radiation Protection Program performs regular inspections of Laboratory workspaces to ensure compliance with programmatic standards. However, many EH&S Division programs do not have similar forms of programmatic assurance. These responsibilities need clarification and guidance to avoid the potential conflict of interest for EH&S staff as they provide support to the divisions and discharge their stewardship responsibilities. In short, currently EH&S oversight is too decentralized and ineffective.

Root Cause 2.1.2 - Self-assessment inspection instructions and techniques require improvement.

The Division Self-Assessment is not providing adequate assurance of ES&H performance to the home division. As the institutional ES&H Self-Assessment relies upon the 16 separate division self-assessments, the ES&H Division Self-Assessment results do not provide adequate institutional ES&H assurance. In addition, line managers lack a fundamental understanding and training to properly participate in division self-assessment activities. Work observations and inspections are sometimes perceived as punitive and therefore actively resisted.

The EH&S Division liaison program creates a potential conflict between satisfying safety and scientific program goals. This is exacerbated in the Integrated Functional Appraisal, which requires EH&S Division liaisons to audit divisions that they normally serve in support roles.

Root Cause 2.1.3 – The term line management is not defined in LBNL's RPM.

Consequently, existing policies for line management responsibilities in performing ES&H self-assessment activities are too lenient and unenforceable. Therefore, the concept is not well understood or consistently applied across the Laboratory. This results

in safety coordinators performing many ISM duties that are line management responsibilities

Line management responsibilities in performing self-assessment activities require greater definition. In many cases, line managers rely on division safety coordinators to perform workspace inspections, hazard analysis, hazard control, and ES&H communications. These are central tenets of ISM that must be performed by line managers. Safety coordinators should support line managers and provide the tools necessary to effectively fulfill these responsibilities.

Policy for line managers engaging EH&S division staff also require improvement. Many line managers do not consult EH&S staff in planning and modifying work.

Root Cause 2.1.4- Communication of line management ES&H responsibilities requires improvement.

Although generally knowledgeable of ISM, line managers are unaware of their specific ES&H responsibilities. PRDs are not explicit in stating line management ES&H responsibilities, and many principal investigators do not have PRDs. PIs often rely on post-docs and graduate students to implement safety policies.

Principle 3 – Competence Commensurate with Responsibilities:
Personnel shall possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Issue 3.1 – There is not a uniform process for educating managers, supervisors, and coordinators on overseeing and implementing safety in the workplace.

Root Cause 3.1.1 – The lack of a thorough analysis of the need for and type of safety training for supervisors led, in part, to a decision not to require this training.

Even though there are ongoing efforts to improve safety training for line managers, development of new policies and administrative controls as part of a corrective action to address Issues 1.1 and 2.1 should result in a thorough analysis of these training needs and the development of a required course to meet these needs.

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.

There are only two required courses for safety coordinators and no other qualifications have been formalized.

Issue 3.2 – Work pressure could be driving people to work in less safe ways, causing mistakes, or creating stressed personal interactions.

Root Cause 3.2.1 – In the absence of information, assumptions are being made regarding the relative values of the work being performed resulting in risk acceptance that may not be what is intended.

Employees state that excessive workload requirements including tight schedules and feeling overwhelmed lead them to take shortcuts in risk management to increase their work volume. Employees see safety as a lower priority to "production" because of cuts in safety staff and safety issues that remain unfixed.

Root Cause 3.2.2 – Risk taking is recognized, tolerated, and encouraged by workers, supervisors, coworkers, guests and students.

The situation is aggravated during changes in resources: Reductions-In-Force (RIF), a facility and/or the number of users outgrowing static safety resources. Current Standards, Policies, and Administrative Controls are not strict enough to prevent these practices. Management policies do not provide adequate expectations and direction on risk management to allow safety to be of paramount importance. People will take safety risks to get the job done in order to retain project funding. Management and management systems are tolerating or encouraging this practice. Safety does not appear to be a value in how work is to be done.

Root Cause 3.2.3 – Current Standards, Policies, or Administrative Controls are not strict enough to prevent these practices.

Management policies do not provide adequate expectations and direction on risk management to allow safety to be paramount value. Teamwork should be enhanced to stress that schedule is always second to safety.

Root Cause 3.2.4 – Less than adequate work control process when scope, resources, personnel, schedule change (see Root Cause 3.2.2, Issues 5.1 and 7.1).

Instances were noted in which a new definition work and hazard analysis were not triggered when changes impacting the work and/or hazards were evident.

Root Cause 3.2.5 – A significant portion of the staff believe that improvements do not occur unless there is a serious problem.

Interviews with supervisory and non-supervisory employees disclosed their concern that "someone had to get hurt" before a safety problem would get fixed (see Issue 4.1).

Issue 3.3 – Causal analysis is inconsistently applied and may not result in corrective actions that will prevent recurrence.

Root Cause 3.3.1 – Staff performing causal analysis are not adequately trained, possibly due to the failure of management to recognize the need or to identify the staff position most likely to be involved in causal analyses.

LBNL only performs in-depth causal analysis by trained investigators for serious incidents. Only a handful of Lab staff has formal root cause analysis training. Although safety coordinators and EHS liaisons are most likely to perform causal analysis investigations, the majority of this staff lacks any formal root cause analysis training.

Principle 4 – Balanced Priorities:
Resources shall be effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.

Issue 4.1 – The Lab is in a reactive posture with respect to ES&H.

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.

Even though there is a very proactive approach in many elements of LBNL, the wide spread perception is that the Laboratory is in a very reactive posture with respect to ES&H. Significant portions of the staff believe that improvements do not occur unless and until there is a serious problem. Interviews with supervisory and non-supervisory employees disclosed their concern that "someone had to get hurt" before a safety problem would get fixed.

When safety issues are identified, there has been less than adequate management support of staff, first line and middle managers, both in the form of encouragement, rewards and availability of time. Employees see safety as a lower priority to "production" because of management actions that cut safety staff while leaving safety issues unfixed.

Risk taking is recognized, tolerated, and encouraged by coworkers, supervisors, guests, and students. This situation is aggravated during RIFs and growth periods because there is less than adequate change control when scope, resources, personnel or schedules change. Some staff expressed belief that raising safety concerns with management can result in missing a promotion (e.g., negative PRD), demotion, and even firing.

Issue 4.2 – Excessive focus on DART and TRC rates has negatively impacted the safety program.

Root Cause 4.2.1 – Although evidence exists that LBNL conducts evaluation of accidents and near hit/miss events, the communication of this information to the general work population focused too heavily on previous injuries and injury rates and insufficiently on safe work practices to avoid these incidents.

Accident and near hit/miss events constitute a wealth of incident avoidance information. Responses to accidents at other DOE sites was interpreted by some employees as a need to avoid a shut down, possibly by withholding safety information, rather than focusing on how to work safely.

Issue 4.3 – Communication of line management ES&H responsibilities requires improvement.

Root Cause 4.3.1 – Performance expectations and review for principal investigators requires improvement.

Although generally knowledgeable of ISM, line managers are unaware of their specific ES&H responsibilities. PRDs are not explicit in stating line management ES&H responsibilities, and many principal investigators do not have PRDs. PIs often rely on post-docs and graduate students to implement workplace safety policies.

Root Cause 4.3.*2* – In general, principle investigators do not provide proper mentoring to students and post-docs.

This failure is due to lack of knowledge and training. Often, students and post-docs receive no mentoring from their PIs on understanding and fulfilling their ISM responsibilities. Students and post-docs frequently are focused exclusively on science, to the detriment of everything else. Lacking effective safety mentoring from PIs, this can result in unsafe behavior.

Issue 4.4 – Span of control is too large and does not allow for responsible safety management (see Root Cause 1.1.3).

Root Cause 4.4.1 – Current practice allows PIs to supervise too many people to effectively fulfill ISM responsibilities.

Some principal investigators supervise 20-60 people. In many cases, no formal line of management authority and responsibility as defined by LBNL policy exists between the PI and staff. This results in PIs delegating core ISM responsibilities to graduate students and post-docs. Students and post-docs are not qualified to perform line management ISM responsibilities.

Principle 5 – Identification of Safety Standards and Requirements:
Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

Issue 5.1 – It is not clear that activity hazards that are below the threshold or not the primary subject of AHDs are adequately analyzed and controlled.

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.

Laboratory management needs to recognize that low-level hazards can pose a threat to safety and develop a policy, the implementation of which would mitigate the risk of adverse consequences. This policy could include recognition by line mangers of their safety responsibilities in assigning and authorizing work (see Issues 1.1 and 1.2).

Root Cause 5.1.2 – The current policy and implementation guidance for AHDs lacks specificity, resulting in inconsistent implementation across the institution and frequent interpretation that allows for lower standards to be used.

The current policy needs to be improved to meet these concerns (see Issues 7.1 and 7.2).

Root Cause 5.1.3 – The current assessment and performance evaluation processes for work authorizations, particularly AHDs, either lack the depth or are conducted by individuals closely aligned with the programs under scrutiny, thereby enhancing chances of less-than-rigorous inspections and/or evaluations.

Issue 5.2 – Subcontractors seem to be held to a lower safety standard than comparable LBNL staff.

Root Cause 5.2.1 – The perception of a double standard in safety oversight may be related to there being more levels of safety oversight for Lab staff.

This issue is derived from interviews with craft employees in Facilities Division. Safety inspectors and EH&S staff must make a special effort to ensure that subcontractors and their LBNL counterparts are held to the same safety standards and subjected to the same oversight. LBNL staff and subcontractors need to be routinely reminded that "Stop Work" responsibility when unsafe practices are observed applies to both equally.

Issue 5.3 – The work authorization process is not well suited to project/ maintenance type work.

Root Cause 5.3.1 The Laboratory currently lacks policies and implementation modes that include rigorous hazard identification and detailed, documented work planning for project/maintenance-type work and activities including legacy clean-up activities.

Any improvement in this aspect of the work authorization process should be part of the overall improvement in work planning and authorization (see Issues 7.1 and 7.2).

Principle 6 – Hazard Controls Tailored to Work Being Performed: Administrative and engineering controls to prevent and mitigate hazards shall be tailored to the work being performed and associated hazards.

Issue 6.1 – Safety is not a multilayer redundant consideration in all divisions: some hazard controls do not allow for human error.

Root Cause 6.1.1 – Currently, no management policy requires safety walk-arounds by line managers.

The policy that exists is vague and open to interpretation. As a result, the division implementation of safety walk-around programs is inconsistent. Some managers walk their spaces weekly, others once a year, some not at all. The current policy also can be interpreted that managers can delegate this responsibility – safety committees or safety coordinators sometimes carry out this vital management duty. In addition, no training is provided to line managers on how to organize a safety walk-around program or how to conduct the walk-around itself (see Issue 3.1).

Issue 6.2 – Some evidence exists that administrative controls are selected before the need and utility of engineering controls has been determined.

Root Cause 6.2.1 – Some divisions are creating administrative hazard controls that are poorly defined and difficult to implement.

This practice was a factor in the recent radiation shielding events at the Advanced Light Source (ALS). DOE requirements require a hierarchal approach to hazard controls that rely on engineering controls first, and then administrate controls, and finally personal protective equipment.

Issue 6.3 – Facility inspection program is variable in frequency and effectiveness and is not identifying hazards in a timely fashion.

Root Cause 6.3.1 – Lab policies do not specify frequency of facility inspections and training of those responsible is lacking (see Issues 1.1, 2.1, and 3.1).

Evidence demonstrates that line management and EH&S technical staff is not uniformly enforcing the use of administrative controls when they are established.

Principle 7 – Operations Authorization:
The conditions and requirements to be satisfied for operations to be initiated and conducted shall be clearly established and agreed upon.

Issue 7.1 Lab-wide work control program is less than adequate.

Root Cause 7.1.1 Standards, policies and/or administrative controls (SPAC) designed to ensure adequate work planning either lack detail and are confusing and incomplete, or do not exist.

The SPACs in place are not strict enough or are poorly enforced. In addition, it is not clear that activity hazards that are below the threshold or not the primary subject for Activity Hazard Documents (AHDs) are adequately analyzed and controlled. This problem may be related to the ambiguity of the current guidance for developing an AHD.

Although significant hazards are controlled through formal authorizations, the process for lower-level hazards is largely undefined. As a result, divisions employ a variety of line management authorizations to varying degrees of effectiveness.

Root Cause 7.1.2 – Adherence to the existing work control program is less than adequate and communication by managers of the requirement and value of compliance needs reinforcement.

Employees not adhering to the current work authorization requirements failed to understand that they were responsible for compliance.

Root Cause 7.1.3 – Corrective actions developed in response to inconsistent adherence to work planning and authorization policies are often delayed.

This inadequacy is related to the lack of or ineffective communication by laboratory senior and middle managers.

Issue 7.2 – The requirement to keep the AHD personnel list current is not clear.

Root Cause 7.2.1 – The current SPAC for work planning is not strictly enforced and the lack of clarity in the policy and its implementation likely contributes to this leniency (see Root Cause 7.1.1 and Issue 5.1).