

# ISM/Safety Improvement Project Lessons Learned

## I. Project Plan Development

Brookhaven National Laboratory's vision is that of simultaneous excellence in science, operations, and community and stakeholder relations. Excellence in operations includes as its highest priority, demonstrating world-class performance in worker safety and health and environmental stewardship. To accomplish the aforementioned goals, laboratory senior management implemented a project management approach to managing improvements to safety management processes.

### a. Discussion of Activities

- **Project manager selection** – In May 2005, Laboratory Management was informed that the Department of Energy's Office Independent Oversight Office (Office of ES&H Evaluations) scheduled an inspection of BNL's ES&H program for January/February 2006. As a lessons learned from the 1997, 1999 and 2000 inspection, the Deputy Director for Operations (DDO) realized the importance of appointing a project manager to prepare the institution and manage the activities associated with hosting a broad scope on-site inspection.
  
- **ISM Readiness Review/Gap Analysis** – In anticipation of the DOE evaluation of BNLs ES&H program the DDO determined that a readiness review of Laboratory activities against the Integrated Safety Management System (ISMS) framework should be conducted. The readiness review was comprised of a highly credible team (i.e. Oak Ridge, Pacific Northwest, Idaho, DOE, and Battelle – former corporate officer, McCallum - Consultant) of recognized experts with broad experience in, and understanding of ISMS and Laboratory operations. The inspection mirrored the inspection process employed by the DOE Independent Oversight Office. A scoping/planning visit was held in September 2005. The onsite portion on the ISM readiness review was conducted during a 2 week period of October 2005. The scope of the findings from the review *indicated a programmatic deficiency in feedback and improvement at the institutional level*. Some of the results of the readiness review are summarized below:
  1. No effective institutional processes in place to systematically prioritize, on the basis of risk and within the framework of a lab-wide annual agenda.
  2. ESH&Q/Operations related conditions were not being addressed in a timely manner. Extent of condition, corrective actions, effectiveness reviews were ineffective. Major assessments conducted were not addressed (Multi-Disciplinary Task Force [2003], DOE Chicago ISMS Assessment [2004], Focused Management Review [2005]).
  3. A large percentage of Assessment Tracking System (ATS) corrective actions were overdue or extended multiple (3-6) times with no justification.
  4. Critical ISM programmatic documentation did not reflect ESH&Q/Operations (e.g., integrated assessment and ISM program description).
  5. Work planning and control training, qualifications, and skill of the worker and work permit use were inconsistent.

6. The requirements management process could not demonstrate that all contract clauses were being met.
  7. DEAR 970.5223-1 (contract clause I.86) to annually submit safety performance objectives, measures and commitments was not being met (e.g., not performed for 3 years).
- **Reviewed the last 3 years (2003 through 2006)** - Institutional ISM assessments (external & Internal). To close the loop with the failure to address major assessments and findings from the ISM Readiness Review, BNL binned report (Multi-Disciplinary Task Force [2003], DOE Chicago ISMS Assessment [2004], Focused Management Review [2005], and ISM Readiness Review [2005]) findings/conditions to common categories and developed 5 problem statements/areas that require further analysis.
    1. The Laboratory has not established effective institutional- level self assessment, corrective action management and feedback and improvement processes.
    2. The work planning and control process is not achieving laboratory goals and objectives.
    3. Laboratory and internal controlled procedures are not current and in some cases do not offer adequate or complete instructions.
    4. Communication and involvement processes do not always result in adequate understanding of, and response to ESH&Q and Operational issues and decisions.
    5. Corrective action/issues management process is not achieving the Laboratory's goals and objectives.

***The problem statements/areas formed the foundation and Work Breakdown Structure (WBS) for the ISM/Safety Improvement Project Plan.***

- **Causal analyses** – causal analysis was performed on each of the problem statements. The institutional feedback and improvement programmatic deficiency causal analysis was performed by the Laboratory's Policy Council (Level 1 Managers, Assistant/Associate Laboratory Directors) facilitated by trained causal analysis subject matter expert. The other 4 causal analyses on the problem statements were performed by groups of BNL managers, supervisors and workers utilizing TapRoot and the questioning to the void ("five whys") technique. Each cause was binned using the causal analysis tree from the DOE Occurrence Reporting Causal Analysis Guide.
  - In addition to the causal analyses performed, a safety culture survey was performed. The Laboratory Director and/or Deputy Directors provided opening remarks at each of the survey sessions.
- **Corrective Action Development** – after completing the causal analyses and survey, corrective actions were identified to address the root and direct causes, and actions needed to strengthen the BNL safety culture. Corrective actions were mapped to the respective WBS section.

**b. Analysis / Recommendations**

Reflecting back on the process for developing the ISM/Safety Improvement Project Plan, the ISM Project Manager found that the process was sound and very effective

for getting all levels of management, supervisors and workers involved with identifying deficiencies, analyzing the deficiencies and development of corrective actions needed to drive improvement at BNL.

**Key attributes:**

- Senior Management ownership and performance of the institutional feedback and improvement causal analysis
- Review of previous assessments and binning of findings and conditions under common problem areas, which resulted in development of a problem statement to be analyzed.
- Worker involvement, specifically a staff member from each of the BNL Departments (i.e. light source, collider, waste management, biology, chemistry, radiological control, etc...) in the causal analysis and identification of root and direct causes.

*The aforementioned attributes demonstrate disciplined thought and having the right people in the right seat.*

**Recommendation: NONE**

## **II. Challenges/Management Buy In**

### **a. Discussion of Activities**

- **Contributed Resources** – The ISM/Safety Improvement Project’s success was predicated on the availability and use of contributed resources. Line management had to ensure resources identified to support project objectives were made available in the time frames specified. The ISM project manager basically had no authority or control of resources. To address contributed resource concerns an integrated project team approach was established. The integrated project team consisted of DOE-BHSD, Laboratory Director, DDO, Policy and Strategic Planning Office and ES&H Assistant Laboratory Director (ALD). *See ISM/Safety Improvement Project Organization Structure (Figure 2 in the plan).*
  - **Level II Managers ownership** – To ensure senior management involvement and support, level II managers were assigned responsibility for each of the WBS sections. Business plans and performance goals were also updated to reflect the added roles and responsibilities.
- **Communication** – communication was a critical element for the success of the ISM/Safety Project. For communications to be successful, a communications plan was developed, which identified the target audiences and time frame for conveying specific messages. Target audiences included: Brookhaven Science Associates (BSA) Board, Battelle Laboratory Operations Risk Committee, Management & Science Councils, DOE Headquarters and Site Office, and general employees and guests.

Activities under this element include:

- Established an ISM Core Team – The core team met 2-3 times per month to develop ISM messages and flowdown of requirements to all staff, visitors and guests. The core team was consisted of a minimum of 1 staff member from each Directorate (i.e. NSLS, C-AD, Safety &

Health Services (SHS), Radiological Control, Environmental & Waste Management, Administration, Community Relations, Quality Management, Small Science [chemistry, biology, instrumentation, etc...]).

- DDO, ES&H ALD, Policy & Strategic Planning ALD, DOE-BHSO Operations Manager and ISM Project Manager had monthly (4-6 week) visits to Germantown (Office of ES&H Evaluations - Open talks - sharing strengths/weaknesses and what the institution is doing to get a handle of those issues, and progress/status on the ISM/Safety Improvement Project objectives.
  - An ISM Web-site was set up for easy sharing of information with Laboratory and DOE stakeholders. The DOE site office and HS-64 Inspection team found the site to be invaluable. The HS-64 team was able to access the site from off-site and obtain key documents and progress reports at their convenience.
  - Communication plan – key objectives/messages, key actions, media/method/venue, schedule/frequency and responsible manager to serve as the spokes person.
- **Project Plan Approval/Funding** – funding support activities can be a tough sell in research and development environments. To provide a complete understanding for the needs of the project, a resource matrix detailing needs for each of the WBS elements was developed up front, presented to senior management and aligned to address significant programmatic weaknesses identified from the ISM Readiness Review. Baseline funding was provided late in the fiscal year.
  - **Integration of new requirements/activities** – In developing and executing project objectives, it was realized that improvement actions and opportunities for improvement identified as activities were being implemented would also be included in the ISM/Safety Improvement Project Plan. New initiatives added include Arc-Flash event, DOE O226.1, Oversight/Contractor Assurance, and 10CFR 851, Worker Safety and Health Rule.

## **b. Analysis / Recommendations**

### **Key Attribute:**

- It was recognized early on that with contributed resources a major challenge exist to make sure project deliverables are completed within the time frame established. The DDO, ES&H Director and ISM Project Manager recognized if BNL was to be successful in utilizing a project management approach to managing the ISM/Safety Improvement Project, senior management must have ownership and commitment to the improvement process.
- The establishment of a core team of diverse staff was instrumental in ensuring that project objectives/status and new initiatives were consistently shared across organizational boundaries.
- Integration of new initiatives and other corrective action plans into the ISM/Safety Improvement project plan allowed for senior management to keep a pulse of the initiatives and action plans. Kept duplication of actions to a minimum and allowed us to look across organizational boundaries under one institutional improvement plan.

## Recommendations:

- After analyzing information exchange efforts throughout the implementation / execution of the project plan improvements within the communications element were noted. Although a communications plan was developed and executed, it took 12 months to finalize the plan, agree on content, key messages, methods, and management spokespersons due to differing professional opinions. In some respects, implementation of the project plan and upcoming ES&H Evaluation was looked at as a middle management activity and Laboratory dignitary tour provided to high level DOE or political figures. Additionally, early on some thought the communications should come from middle management and feed up to senior management (i.e. Lab Director, DDO and Deputy Director for Science (DDS), Assistant Laboratory Directors). The Senior Management issue was resolved late into the execution of the project plan.
  - To preclude differing professional opinions and development and implementation of the communications planning, **senior management must set the tone from the top** early on and in coordination with the execution of project objectives. If senior management is not involved or does not believe in the messages being conveyed, cultural barriers can derail communication efforts.
- Although funding was not an issue due to a majority of the activities being implemented by contributed resources. Funding must be established and committed early in the implementation/execution phase.
- Integration of initiatives and corrective actions kept senior management abreast of progress/status. However, if integration is to be successful initiative and corrective action owners must be involved in development of the master plan for consistency, define how progress and status will be reported and closure of actions/activities.

*Stakeholder, customer, Senior Management Involvement – Level 5 Leadership.*

## III. Performance Monitoring

### a. Discussion of Activities

- **Project Reviews/Performance Reporting** – In addition to the ISM/Safety Project Manager continuously evaluating progress and performance towards meeting project objectives. Managers responsible for WBS sections reported progress monthly to Senior Management and DOE-BHSO. A project review meeting was held every 4 – 6 weeks. Participants included the Laboratory Director, DDO, ESH&Q ALD, P&SP ALD, and various Department Chairs and Division Managers. Level II managers responsible for WBS sections reported on the following:
  - i. Current project status (e.g., cost, schedule variance)
  - ii. Future status and forecast
  - iii. Emerging risk and proposed changes to the project plan
  - iv. Additional resource needs

- **Assessment Tracking System (ATS)** – Corrective action management was a key finding in the ISM Readiness Review. Several corrective actions were overdue
- **Change Control** – Established project change control approval levels. Areas of concern were cost, schedule and scope (modifications to corrective actions that addressed direct and root causes)

**b. Analysis / Recommendations**