

ISM Verification Results Summaries

(The official BNL Verification Report is on the DOE ISM Website at <http://tis-nt.eh.doe.gov/ism/> under "Verification" and then listed under Chicago)

The ISM Verification Report presented its results in three layers. The most detailed layer was documented in Volume II. Individual team members identified specific technical strengths and issues during their “in-field work” and documented in the Criteria Review and Requirements Documents (CRADs). The team summarized these technical issues and strengths into “Deficiencies” (items that must be fixed before the ISM program Description could be approved); “Areas for Improvement”; and “Noteworthy Practices” for inclusion in the report details of Volume I. Those “Areas for Improvement” and “Noteworthy Practices” that the team considered the most important, were incorporated into the Volume I Executive Summary.

The tables below provide the summary statistics of the “Deficiencies”; “Areas for Improvement”; “Noteworthy Practices”; Issues; and Strengths identified in BNL’s ISM Verification Report. The actual texts of these items are in the follow-on pages. BNL’s/BHG’s next task is to evaluate these items to ensure we understand the “issues” the team was trying to communicate, and then modify existing improvement actions or establish new improvement actions as appropriate.

Doug Ports will work with the various Management System Stewards and the SBMS Steering Committee to coordinate our efforts to understand what this all means and to help ensure our improvement agenda properly assimilates this information.

<u>ISM Report Volume I Executive Summary</u>	<u>Deficiencies</u>	<u>Areas For Improvement</u>	<u>Noteworthy Practices</u>
BNL	0	3	3
DOE BHG	0	1	1
Total	0	4	4

<u>ISM Report Volume I Details</u>	<u>Deficiencies</u>	<u>Areas For Improvement</u>	<u>Note Worthy Practices</u>
BNL	0	14	5
DOE BHG	0	3	3
Total	0	17	8

ISM Report Volume II CRADs	Technical Issues	Technical Strengths
Institutional	11	16
Facility	0	21
Activities	4	26
Topics	7	11
DOE BHG	5	5
Total	27	79

Volume I: Areas For Improvement

The numbers that follow the area for improvement correspond to the associated Criteria Review and Approach Document (CRAD). Items marked with a “♦” were identified in both the Volume I Executive Summary and the Volume I details section. Items marked with a “•” were identified only in the details section.

BNL

- ♦ At the Institutional level, the self-assessment system needs strengthening. Institutional expectations for management system assessments have not been developed. As a result Management cannot be assured that a comprehensive set of management assessments are being conducted. Analyses of causal factors and trends generally are not implemented on a laboratory-wide level on self-assessment results. These results are needed for use in other institutional elements for corrective action, trending and causal-factor analyses, lessons-learned, Occupational Medicine, and the Price Anderson Amendments Act (PAAA) program. (CRADs 1.3, 1.5, 2.5, 7.1, 7.4, 7.5)
- ♦ The overall Laboratory-wide awareness and use of the Lessons-learned program is low. Processes to enhance feedback and improvement need further development within the SBMS to link Lessons-learned to the work planning and training systems. Valuable information is available in self-assessments and external (non-BNL) reviews, but the information is not being robustly captured for feedback and improvement, such as from the work permit process, and lessons learned communications across the entire Laboratory. A laboratory-wide, employee-suggestion system will help involve workers in the feedback improvement processes. (CRADs 1.5, 4.5, 5.5, 7.1, 7.4, 7.5)
- ♦ The corrective action process at the institutional level needs to be strengthened. There does not appear to be a process to ensure that immediate actions to control hazards are being taken while longer-term corrective actions to address root- and causal- factors are being developed. A large percent of those items being tracked are past due. Not all items that may have institutional-level implications have included in the Laboratory-wide tracking system. A significant number of open corrective items are not being completed on a timely basis. (CRADs 1.5, 7.1)
- BNL lacks a documented process to provide the methodology for reviewing and approving of the Health & Safety Plans of subcontractors. (CRAD 4.2)
- Document-control processes at the Plant Engineering Division for ES&H-related procedures need to ensure that they are periodically reviewed and revised as necessary. (CRAD 4.3)
- The BNL Training and Qualifications Management System Description does not clearly demonstrate how BNL’s training requirements apply and are tracked for subcontractors. (CRAD 6.7)
- BNL needs to establish a system to ensure that users and guests are medically qualified to perform work and are under medical surveillance as required by DOE and OSHA. In such a system, BNL should identify essential job tasks, chemical and physical hazards, and provide this information to the user/guest. (CRAD 1.3)

- A written Subject Area or Program Description that documents the processes for strategic/institutional planning, critical outcomes, objectives, and institutional performance measures within the Integrated Planning Management System should be developed to improve consistency in the strategic and integrated planning processes across the Laboratory. (CRADs 1.1, 1.4)
- On an Institutional level, ESH Standard 1.3.6 should be modified to make its requirements more consistent with line management's noteworthy implementation of it. The following are opportunities for improving ESH 1.3.6, Work Planning and Control:
 1. Defining the processes that develop, approve, and implement standard operating procedures, specific work procedures, and Job Safety Analyses, or establish links between them.
 2. Clearly explaining that for tasks with specific hazards other controls must be implemented to reduce the ESH risk rating, e.g., lockout/tagout, or confined space entry permit.
 3. Include in ESH 1.3.6 Attachment 6: Work Control Self-Assessment a requirement to observe work in progress to evaluate the implementation of work controls. (CRADs 1.2, 1.3)
- The Employee Handbook, along with training, provides the initial introduction to safety roles and responsibilities for the new employee. However, the Safety section of the Handbook does not make any reference to Integrated Safety Management or the Standards Based Management System. Updates are manual and require mass mailings; the document is not available on the Web. (CRAD 1.6)
- The Quality Program is in transition with large variability in implementation across the Laboratory. Recently, BNL management's attention intensified and improvement actions are to be demonstrated. (CRAD 7.5)
- Where priority on the work, hazards, controls, work-execution functions has been demonstrated, it is now appropriate to bring BNL's and BHG's focus on the feedback and improvement loop of ISMS. The ISMS framework looks to the design and execution of this loop wherein the measures for demonstrating performance are considered early in the processes of work definition/hazard identification and control. Improvement is needed in tying the feedback loop into the up-front thinking of ISMS at BHG/BNL. (CRADs 7.1, 7.4, 7.5)
- The Preventive Maintenance prioritization system is not as well defined or documented within program facilities. Different methods are used within the various facilities reviewed by the Team. Consistency is needed across the various BNL facilities. Deferred preventative maintenance and associated risk should be reviewed by management and documented as acceptable. (CRAD 2.1)
- The development of the Building Manager Subject Area should be completed and the position of Building Manager Program Manager should be filled. These actions will greatly solidify the Building Managers' program, the maintenance of FUAs, and consistency across programs. (CRAD 2.6)

BHG

- ◆ Several BHG Procedures related to the Work Control Process need updating. The approval and authorization process for smaller conventional construction projects, such as General Plant Projects (GPP), Accelerator Improvement Project (AIP), and Special Materials (SM) projects, has evolved into a programmatic approach. However, because of recent changes in the Contractors work development processes and SMBS subject areas and processes, BHG Procedures that guide the Project Managers on project approval, authorization, change control, and close-out need to be updated. BHG is making revisions to these directives with an expected completion date of August 2000. (CRAD 8.1)
- There is no formal BHG procedure that describes the Critical Outcomes Development or Change Process. However, the Prime Contract (Articles 6, 7, 72, and Appendix B) does establish the basis for the process. BHG's senior- and mid-level management is knowledgeable about the process used for establishing/negotiating the measures with the BNL contractor and for change control. A BHG Procedure is under development. (CRAD 8.1)
- BHG does not have a formal procedure that outlines BHG's Quality Assurance (QA) program as required by DOE O 414.1A, and needs to develop a more formally structured Self-Assessment Program at the Group-wide level. The self-assessment program should include performance objectives and criteria to measure the quality and effectiveness of the Group in carrying out their assigned functions and responsibilities. BHG's Quality Assurance manager has been tasked with developing a Quality Assurance Plan for the Group. This task is in progress and will include a matrix of QA requirements from both DOE Order 414.1A and ISO 9000. (CRAD 8.2)

Volume I: Noteworthy And Good Practices

The numbers following the noteworthy and good practices correspond to the associated Criteria Review and Approach Document.

BNL

- ◆ The work- planning processes found under ES&H standard 1.3.5 and 1.3.6 and other departmental/divisional procedures that are implemented at facilities for both scientific and laboratory operations work were effective. These work- planning processes were well understood by all levels of employees and involve workers in identifying the hazards and developing and implementing tailored hazard controls. These work- planning processes also ensure effective mechanisms to control and coordinate activities to ensure that the work to be performed is authorized by line management. (CRADS 2.1, 3.2-4, 4.2-4, 6.2-4, 7.3).
- ◆ The requirement that all BNL staff members have a signed Roles, Responsibilities, Accountabilities, and Authorities (R2A2) for their specific job assignment provides an effective mechanism to define employees' roles and responsibilities for ES&H activities related to their work. It also forms the basis to set employees' performance goals and objectives which are directly linked to their work assignment. All employees contacted during the Team's review were keenly aware of their responsibilities related to ES&H activities and

could clearly identify them on their R2A2. The use of R2A2s in developing Job Training Assessments (JTAs) further strengthens the employees' ability to perform at a level of competence comparable to their responsibility. (CRADs 1.6, 1.7)

- ◆ BNL's Senior Managers have demonstrated a strong commitment and leadership to work in a formally agreed-upon partnership with DOE to achieve a shared vision, critical outcomes, performance goals, and objectives, and achieve excellence in implementing a mature Integrated Safety Management System. This strong commitment to achieving ISMS excellence is evident throughout all levels of Laboratory management, and among the scientific and laboratory support staff and trades. Implementation crosscuts each level of ISMS and is focused on individual and line management accountability for ISMS performance. For example, at the Institutional Level this is evident in the FY 2000 policy of aligning the performance expectations of all exempt employees with the Laboratory Critical Outcomes, Objectives, and contract performance measures. This policy will be extended to all non-bargaining unit employees in FY 2001 to align their performance, and goals with those of their managers. At the Facility Level, this is evident in the assignment of Building Managers and involvement of ES&H Coordinators. At the Activity Level, it is evident in the Job Training Assessments and Job Hazards Analysis process and the use of Experimental Review Committees and Pre-Job planning and Post-Job critique sessions to ensure work is performed safely. (CRADs 1.1, 1.4, 1.7, 2.1, 2.7, 3.1, 3.7, 7.1, 7.2, 7.3, 7.4, 7.5)
- SBMS ensures easy access for laboratory personnel and the interested public. The system has hyperlinks to appropriate institutional level policies, guidance, and procedures and ensures configuration control. SBMS maintains control through Management System Stewards who are responsible for all content, updates, and linkages to other documents within the SBMS. Documents updates are easily made, communicated, and tracked. The SBMS provides input to the Training Management System; training requirements are linked to the SBMS. Outputs from the various SBMS Description and Subject Areas are used to identify training needs along with input from SBMS Stewards, Subject Matter Experts, and the Training and Qualifications Committee. (CRAD 1.7)
- Pollution Prevention/Waste Minimization activities are well integrated into all aspects and levels of the Laboratory's operations and activities. This is achieved through incorporation and consideration of environmental management principles within the ISMS. Planning and procurement activities consider the environmental impacts of the work/research to be conducted. A laboratory-wide process assessment has been conducted on all major industrial and research activities to ensure that environmental impacts are considered and, as appropriate, efforts are taken to reduce or eliminate the environmental impacts through source reduction and process modification. The Work Planning and Experimental Review processes provides a mechanism to allow the direct involvement of line management and workers in identifying opportunities for pollution prevention/waste minimization from their work activities. (CRADs 1.2, 1.3, 7.2)

BHG

- ◆ BHG has a strong operational awareness program that is described in the BHG ES&H Management Plan and several BHG procedures that describe the conduct of performance assessments, surveillances, and walkthroughs, as well as the issues tracking, follow-up and reporting within BHG and to the Laboratory. The strength of the program is based on the comprehensive Facility Representative Qualification process, use of highly qualified Subject-

Matter-Experts, and the close collaborative interaction of the Facility Representatives and these with the Laboratory. In keeping with the Departmental Policy DOE P 450.5 for Line Environment, Safety and Health Oversight, these Experts have been thorough in identifying ES&H Issues through a comprehensive assessments program. This program added significant value to the Laboratory and DOE during the Laboratory's transition to its own Independent Assessment function. (CRAD 8.1)

- The BHG ES&H Management Plan in conjunction with the BHG Functions, Responsibilities, and Authorities Manual (FRAM) provides a detailed listing of the assigned responsibilities at BHG. The responsibilities, and authorities of BHG personnel are aligned to the guiding principles and core functions of ISM. The ES&H Management Plan goes beyond the requirements of the FRAM in fully documenting BHG's ES&H programs. (CRADs 8.1, 8.2)
- There is a strong commitment by BHG's management and staff to work in partnership with the Laboratory, per Departmental Policies DOE P 450.4 and DOE P 450.5, to achieve all shared critical outcomes, performance goals, and objectives, and to achieve excellence in implementing ISMS. BHG's management and staff have also demonstrated a commitment to fostering continuous improvement at the Laboratory and within the Group functions. (CRAD 8.2)

ISM Report Volume II Criteria Review and Approach Document (CRAD) Details

CRAD 1 Institutional

Issues

- ESH Standard 1.3.6 should be modified to make its requirements more consistent with the line's implementation.
- No Occupational Medicine Management System self-assessment has been conducted to see if the line's process for making determinations for medical qualifications or identification of medical surveillance for users and guest collaborators is adequate (1.2-2).
- BNL needs to establish a system to ensure that users and guests are medically qualified to perform work and are under medical surveillance as required by DOE and OSHA. In such a system, BNL should identify essential job tasks, chemical and physical hazards, and provide this information to the user/guest.
- At the institutional level, the corrective action process does not describe how assessment findings are considered for implementation of immediate and interim corrective actions necessary to control hazards and enhance requirement compliance.
- The following are opportunities for improvement in ESH 1.3.6, Work Planning and Control:
 1. Defining the processes that develop, approve, and implement standard operating procedures, specific work procedures, and Job Safety Analyses, or establishing links between them.
 2. Clearly explaining that for tasks with specific hazards other controls must be implemented to reduce the ESH risk rating, e.g., lockout/tagout, or confined space entry permit.
 3. Include in ESH 1.3.6 Attachment 6: Work Control Self-Assessment a requirement to observe work in progress to evaluate the implementation of work controls.
- The Laboratory PAAA Coordinator is not provided with complete self-assessment information from line organizations for the purposes of trending potential programmatic concerns.
- Causal-factor analysis and trending is not yet being completed for assessment results, and in some cases, for occurrence reports or PAAA non-compliance reports.
- A formal process for Training to capture Lessons Learned and feedback obtained from the implementation of the feedback and improvement loops provided in ESH Standards 1.3.5 and 1.3.6 is not in place.
- Action items generated from these BHG-OMD surveillance reports that are appropriate for institutional level action are not yet tracked via the Laboratory-wide Assessment Tracking System.
- A review of the status of action items included in the laboratory-wide action tracking system shows that a significant number of the open action items are past the scheduled due date.
- It is not clear that the corrective action process adequately considers immediate actions that may need to be implemented while taking the necessary time to develop corrective actions to address root and causal factors.

Strengths

- Management's attitude and commitment towards using the SBMS and its associated documents appears to be extremely high.
- A significant and noteworthy component of the contractor's hazard analysis process for environmental hazards is the Phase II EPA Hazard Evaluation Process.
- The Building Manager concept, especially as it pertains to the FUA, is noteworthy as a key integrating element between programmatic needs and ES&H and other operations functions (S1.2-2).
- At the institution-level the Requirements Management Process provides a good mechanism for BNL to ensure that as new DOE and regulatory requirements are evaluated the necessary hazard controls are identified.
- The Process Assessment Forms are an excellent tool for understanding complex processes and managing environmental hazards so that adequate controls are developed and implemented.
- The completion of the Requisition Questionnaire for ISM Flow-Down by the Work Control Coordinator and its use by the Buyer/Contract Specialist to incorporate, as required, the ISM DEAR clause.
- For monitoring institutional performance, the Laboratory is in its early stage of implementing what appears to be an excellent system. This system, the Integrated Information Management System, consists of a database containing all of the contractual measures and their performance results. The database is capable of summarizing the results of these measures at the Laboratory's Critical Outcome and Objectives level down to the Management System level.
- The use of a Peer Review Group for input has been a key factor in the improved community interactions and is thought to be unique within the DOE complex. It represents an innovative and successful approach to help improve a key BNL management system.
- The Community Involvement, Government, and Public Affairs organization demonstrated effective systems for tracking and responding to community input.
- The Independent Oversight Office conducts rigorous evaluations of selected Departmental/Divisional self-assessment programs to verify the effectiveness, and adequacy of the Laboratory-wide self-assessment program. Recommendations from the evaluations help to drive improvements.
- Standards Based Management System as the source for all Laboratory-wide policies, standards of performance, procedures and guidelines.
- The process for developing Roles, Responsibilities, Accountabilities, and Authorities (R2A2) to define individual roles, responsibilities, accountabilities, and authorities for all levels of employees within BNL.
- Individual performance expectations in FY00 for all exempt employees are aligned with Laboratory Critical Outcomes, Objectives, and contract performance measures for safety. In FY01, all non-bargaining unit employee will have their performance goals aligned, as appropriate, with their Managers performance goals.
- All Department/Division will have a Training Plan for their organization that defines roles and responsibilities within the organization for training, identifies individual employee training needs, commits to the conduct of Job Training Assessments, ensures that required training is provided all employees (contractors, guests, visitors, full time employees).
- Training Management System/Training Requirements linked to the SBMS. Outputs from the various SBMS Description and Subject Areas are used to identify training needs

along with input from SBMS Stewards, Subject Matter Experts, and the Qualification and Training Committee.

- Recruitment Process linked to the SBMS through use of R2A2, JTAs, and Job Safety Analyses.

CRAD 2 Facility-Level

Issues

- None

Strengths

- Computer-based SBMS is well organized.
- GPP & facilities project planning and prioritization system is in place and is well documented.
- There is a consistent understanding of R2A2s for work at all levels of the organization.
- 1.3.5 & 1.3.6 processes are established and understood at all levels
- Interviews indicate that there is a good understanding of line responsibilities at the facility
- Appropriate individuals are engaged in the process of identifying and documenting hazards.
- 1.3.5 & 1.3.6 processes are routinely used for the process of identifying hazards.
- NSLS has a very good system for tracking and trending safety findings. It could be used at other BNL facilities.
- The system in place gives the workforce clear limits on the operation of equipment and buildings.
- The ESR and Work Planning process is standardized across the Laboratory.
- The Independent Oversight organization is planning to review the implementation of the self-assessment guidance of eight program line organizations during calendar year 2000.
- A subject area for self-assessment has a Laboratory "Priority 1A," and is expected to be published by June 2000.
- The NSLS corrective action tracking system is a model system. It would be most useful for multi-tenant, multi-user facilities throughout the Laboratory. This system analyzes trends in data; however, it lacks root-cause analysis.
- Use of the ESH Standard 1.3.6 Work Planning and Control for Operations, and the Administration 950 processes at the Waste Management Division are effective work control procedures.
- "Plan- of- the- Day" meetings at the Igloo/Hazardous Waste Management facility typically include a useful discussion about a particular safety topic.
- Tier I Safety Inspections are being carried out effectively at all Waste Management facilities, including the new Waste Management facility, Igloo/Hazardous Waste Management facility, water-processing facilities at building 810/811, building 802B, and building 650. All other facilities reviewed also are using the Tier I process each quarter.
- Line Management at the BLIP, NSLS, Waste Management, Energy, Environment, and National Security, and the Firehouse facilities are clearly responsible for safety management.
- Roles, Responsibilities, Accountabilities, and Authorities are well defined and understood by all personnel interviewed at the BLIP, NSLS, Waste Management, EENS, and Firehouse facilities.

- Training requirements (i.e., job training assessment) of all building managers is thorough and complete.
- New training courses in emergency response, stop work authority, and environmental compliance/awareness has enhanced the competency level of key personnel.
- The forthcoming establishment of a supervisory building manager role to oversee, coordinate, and provide guidance and direction to the Laboratory's building manager's program initiative is a positive step forward.

CRAD 3 S&T Activities

Issues

- None

Strengths

- The close working relationships between the research-and technical- staff in the Physics Department with their departmental ES&H staff was determined to be exemplary.
- Environmental impacts, such as the minimization of waste generation, are fully considered when planning for experiments.
- The use of the R2A2 process as a mechanism to ensure the responsibilities for safety is attained for all BNL employees.

CRAD 4 Site Infrastructure Operations, Maintenance, and Construction Activities

Issues

- BNL lacks a standard process for detailing the methods used to review and approve of subcontractor's health and safety plans.
- Document-control processes have not been implemented for certain Plant Engineering Division's procedures related to ES&H to ensure that the procedures are reviewed and revised, as needed.
- While the ESH STD 1.3.6 Work Permit provides the capability for capturing employee feedback on the work-control process, it does not appear to be a primary vehicle for doing so. This is inconsistent with the ISMS Description, which places an emphasis on the Work Permit as a necessary feedback system.

Strengths

- The inclusion of considerations of waste management, waste minimization, and pollution prevention early in project design and work control processes is a commendable practice.
- During all the work activities observed, workers were very knowledgeable of the hazards, and the appropriate hazard controls established.
- Building Managers and Work Control Coordinators play an important role in identifying the hazards and tailoring the hazard controls. Based upon interviews and observations, this program seems to be working well.
- The use of Work Permits in the Plant Engineering Division is established and is readily apparent. The review of several work activities in the field revealed that the Work Permit process outlined in ESH Standard 1.3.6 is a very good mechanism for controlling and

coordinating work. Building Managers, support personnel, engineers, workers, and subcontractors all were knowledgeable of the system and confident in applying it. Providing authority to Work Control Coordinators, work supervisors, or the (ultimate) workers to specify the need for a Work Permit is commendable.

- The use of the R2A2 process within the Plant Engineering Division is a noteworthy practice. Personnel were very knowledgeable of their form and function.

CRAD 5 S&T “Machine” Operations and Maintenance Activities

Issues

- Lessons learned information will be difficult to capture because feedback information flows mainly through localized, informal channels rather than the specified written forms.

Strengths

- For scientific work, all three Departments provide a personal contact to help external Users in defining their scope of work at the start of planning.
- Centralized location of experiment safety, work control, and ESH personnel at NSLS promotes communication amongst themselves and users.
- The use of the current revision of the work permit under ESH Standard 1.3.6 is not always used at the C-A Department.
- The C-A Liaison Physicist/Engineer position adds great value to the C-A/detector group interface by providing a single point-of-contact.
- C-A Department management is personally involved to a remarkable degree (e.g., signing each pre-authorization checklist) for such a large organization.
- The C-A department PHENIX detector provides a definition of Skill of the Craft for Users (Physicists).
- The C-A department provides Russian and Japanese translations of its ESH Requirements Briefing.
- NSLS supervisors keep current matrices of qualified personnel for skill of the craft tasks and Work Permit screening.

CRAD 6 Environmental Restoration/Remediation Activities

Issues

- None

Strengths

- The Environmental Restoration Division uses the ESH Standard, 1.3.6 “Work Planning and Control for Operations” and the Work Permit effectively and routinely to define work scope and accompany the work coordination and activities throughout the activity life cycle.

- The involvement of critical personnel in the planning stages results in cross-cutting communication, stronger working relationships, more efficient job coordination, and more coordinated, thorough hazard identification.
- The Work Permit process includes the evaluation of waste minimization opportunities as part of the ESH analysis process.
- The Work Permit process is essential to work and hazard control, and governs the work activity throughout its duration. Employee participation in its preparation and execution assures that workers understand the job hazards and operational constraints.
- The contractor (BNL) and subcontractor (Bechtel) have established and implemented an effective program for performing environmental restoration work that is becoming more efficient as managers and staff learn from the process and implement useful revisions.
- ERD appears to be taking advantage of many opportunities for information exchange, worker feedback, and improvement.
- ERD uses R2A2s to assign specific expectations to employee performance.

CRAD 7.1 Radiation Protection

Issues

- The Radiological Control Division does not have in place a complete programmatic activity planning system. Except for personnel performance reviews, there are no formal systems (e.g., project management plans) for short-, medium-, or long-term planning, nor for milestone tracking.
- The system for tracking, trending and analyzing BHG assessment reports is incomplete. Valuable information from lessons-learned is given in these detailed reports. For example, a common theme of not following radiological control procedures is echoed in many of BHG's assessments. If trends in the assessments had been analyzed, this would have been readily apparent, and could have been added to the information in the RAR system to produce more robust lessons-learned information.
- The Radiological Awareness Report (Feedback and Improvement) Program is not fully implemented and requires additional attention from management to become an adequate system for application throughout the Laboratory. For example, there is a basic analysis of each RAR, and an effort to identify common issues in other RARs. However, a review of the RARs for last year indicated that a recurring issue in many of them was a failure to follow established BNL radiological control procedures and policies. The RAR coordinator had not identified this issue as a major trend requiring the attention of BNL's management. Further, the results of BHG assessments are not routinely entered into the RAR process for tracking and trending. The specific RAR areas needing major improvements include the following: formal determination of related programmatic and RAR deficiencies; statistical trending of root- and contributing-causes; rigorous analysis of data and results; reporting analysis information to appropriate management and line radiation workers; and, providing lessons learned information to the entire Laboratory.
- A formal system should be defined for feedback and improvement with the BHG Health Physicist. For example, the BHG Health Physicist does not receive RAR information and analyses.

Strengths

- The Radiological Control Division established a system of professional progression and technician schedules. This outstanding effort has formalized roles, responsibilities, span of control and the minimum and preferred qualifications for all positions in the division. These schedules are more advanced than those of other comparable organizations.
- The BHG's contractor assessment program is noteworthy. There have been routine assessments and reassessments of BNL's major radiological projects and programs. The scope and depth of the assessment system is outstanding, and are contributing to the growth and maturity of BNL's Radiological Control Program.

CRAD 7.2 Environmental Compliance

Issues

- None

Strengths

- **Brookhaven National Laboratory Environmental Management System (EMS)**
The EMS integrates environmental performance and stewardship into all facets of the Laboratory's environmental protection work. Twenty-six Subject Areas associated with the EMS were developed in June 1999 to establish standards for environmental program performance. The EMS is based on the ISO 14000 with increased focus on assuring compliance, preventing pollution, and initiating community outreach.

The BNL EMS is a noteworthy example for consideration by other DOE facilities. BNL already has achieved an ISO 14000 Registration at the RHIC Project, and is on schedule to be ready for independent registration at the Collider-Accelerator Department, Environmental Restoration Division, Waste Management Division, Reactor Division and BLIP in August 2000.

- **Brookhaven National Laboratory Process Evaluation Project (PEP)**
The EPA-mandated PEP has significantly helped line managers in identifying environmental impacts. This program has become an exemplary model for consideration by other DOE facilities. Divisions have completed detailed environmental evaluations of all industrial and experimental processes.
- **Brookhaven National Laboratory Environmental Compliance Representatives (ECRs) Program**
The Environment, Safety, Health and Quality (ESH&Q) have five field-deployed ECRs. The ECRs provide departmental line management with subject-matter expertise and technical support in evaluating processes and complying with ES&H requirements. The ECRs assist line with integrating environmental considerations during the work planning and experiment review phase. The ECR program is an exemplary program for consideration by other DOE facilities.

The ECRs' participate as team members in the Experiment Safety Review Committees and Tier I assessments, provide technical support and assistance during NEPA reviews, analyze environmental audit results, and assist in developing corrective actions. ECRs have assisted the line management in carrying out and completing the EPA-mandated Process Evaluations, and identifying opportunities for preventing pollution.

- Brookhaven National Laboratory Waste Management Representative (WMR) Program
The WMR Program is an exemplary program for consideration by other DOE facilities. It facilitates compliance with hazardous-, mixed-, and radioactive- waste requirements. The Waste Management Division has 5.25 field-deployed technicians who provide technical support to the line management in preparing waste management documentation, managing waste storage areas, resolving waste issues, and arranging waste pick-ups.

CRAD 7.3 Occupational Safety

Issues

- None

Strengths

- The key plan provides computerized building "blueprints," which identifies areas requiring radiation permits and having asbestos hazards. Facilities and Operations personnel can quickly and easily identify the need for work permits for radiation and asbestos hazards from this management system.
- The contract requirements have catalyzed upper management involvement in the ES&H program (e.g., Excellence Indicators for FY ES&H Off-ramp, Attachment 2, Measure 1, Average Number of Facility Walk-throughs Per Senior Manager Per Year, 4/5/00).
- The R2A2s provide an excellent tool for identifying responsibilities and holding all employees accountable for integrating ES&H into their work processes.
- The SBMS System provides a very useful tool for quickly ascertaining safety and health requirements and identifying ES&H needs such as training needs and scheduling. This system makes it easier for line management to implement their ES&H responsibilities by minimizing administrative work.
- The key strength of the ISM implementation is the commitment by the Laboratory Director. His support is the most important driver in setting the pace for ES&H improvement at BNL at the ALD level.

CRAD 7.4 Self-Assessment

Issues

- Corrective actions from completed assessments are tracked in a variety of ways by the divisions and departments. Customized databases, e-mail communication, and printed reports all are used to track their corrective actions. With no standardized system,

trending and root-cause analysis across organizational lines is difficult to undertake. Independent validation or verification of completion of actions is not done routinely.

- Management's analysis of the results of self-assessment from the divisions and departments is still at the developmental stage. These reports are "rolled-up" into the institutional Annual Evaluation of Brookhaven National Laboratory. The FY99 roll-up represents the first year of this process wherein the emphasis was appropriately put on ensuring that the self-assessment process was in place. Plans for the FY00 roll-up calls for a more robust analysis of ES&H performance results.

Strengths

- None

CRAD 7.5 Quality Assurance

Issues

- There is evidence and Laboratory acknowledgement that current QA requirements and functions are not being consistently implemented across the Lab due in large part to the recent changes in the BNL QA program and new organization.

Strengths

- None

8.1 Criteria Review and Approach Document for ISMS Verification at BHG - DOE 1

Issues

- Several BHG Procedures related to the Work Control Process are in need of updating. The approval and authorization process for smaller conventional construction projects, such as GPP, AIP, and SM projects, has evolved into a programmatic approach. However, because of recent changes in the Contractors work development processes and SBMS subject areas and processes, the following BHG Procedures need to be updated:
 - BHG-PM-02 Approve Project Baseline
 - Approve Changes to Project Baseline
 - Construction Directive Authorization (CDA) Process (1997)
 - Design Review of Construction Projects (1997)
 - Measure Contractor Performance Against Baseline (1997)
 - Project Completion and Close Out Process

Revisions to these directives are being prepared with an expected completion date of August 2000.

- There is no formal BHG procedure that describes the Critical Outcomes Development or Change Process. However, the Prime Contract (Articles 6, 7, 72, and Appendix B) does

establish the basis for the process. BHG Senior and Mid-Level Management are knowledgeable about the process used for establishing/negotiating the measures with the BNL contractor and for change control. A BHG Procedure is under development.

Strengths

- BHG has a strong operational awareness program that is described in the BHG ES&H Management Plan and several BHG procedures:
 - BHG-OA-01, Conduct of Performance Assessments
 - BHG-OA-02, Conduct of Surveillances and Walkthroughs
 - BHG-OA-03, Operations Management Division Reporting
 - BHG-OA-06, Issue Tracking and Follow-up
 - BHG-OA-10, BHG Operational Awareness Reporting to BNL
 - BHG-OA-13, Facility Representative Qualification
- The Subject Matter Experts are highly qualified and provide significant value to the Laboratory and DOE by identifying ES&H issues during their assessments.
- The BHG ES&H Management Plan in conjunction with the BHG Functions, Responsibilities, and Authorities Manual (FRAM) provide a detailed listing of the assigned responsibilities at BHG. The responsibilities and authorities of BHG personnel are aligned to the guiding principles and core functions of ISM.

8.2 Criteria Review and Approach Document for ISMS Verification at BHG - DOE 2

Issues

- BHG does not have a formal procedure that outlines BHG's Quality Assurance program as required by DOE O 414.1A. BHG's Quality Assurance Manager has been tasked with the development of a Quality Assurance Plan for the group. This task is in progress and will include a matrix of QA requirements from both DOE Order 414.1A and ISO 9000.
- BHG does not have a formal Self-Assessment Program at the Group-wide level. Individual Divisions conduct their own annual self-assessments. A more formally structured self-assessment program is recommended.
- Although not specifically within the scope of this review, the draft DOE-CH FRAM CH M 411-1.1A, Attachment 3, Chicago Operations Office Quality Assurance Plan, includes a requirement for CH to conduct an Independent Assessment of BHG. This plan needs to be finalized to provide guidance to the CH group offices.

Strengths

- Strong BHG management commitment to implementation of ISMS and continuous improvement is evident.
- The BHG ES&H Management Plan in conjunction with the BHG Functions, Responsibilities, and Authorities Manual (FRAM) provide a detailed listing of the assigned responsibilities at BHG. The responsibilities and authorities of BHG personnel are aligned to the guiding principles and core functions of ISM.