Summary Report

Inspection of Environment, Safety, and Health Management and Emergency Management of the

Idaho Operations Office and Idaho National Engineering and Environmental Laboratory

September 2003

Office of Independent Oversight and Performance Assurance
Office of the Secretary of Energy

OVERSIGHT

Table of Contents

Abbreviations Used in This Report

ALARA	As Low As Reasonably Achievable
ATR	Advanced Test Reactor
BBWI	Bechtel BWXT Idaho, LLC
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EAL	Emergency Action Level
EFIS	Emergency Firewater Injection System
EM	DOE Office of Environmental Management
ERO	Emergency Response Organization
ES&H	Environment, Safety, and Health
HA	Hazards Assessment
ID	Idaho Operations Office
IHR	Independent Hazard Review
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IRC	INEEL Research Center
ISM	Integrated Safety Management
LOCA	Loss-of-Coolant Accident
NE	DOE Office of Nuclear Energy, Science and Technology
OA	Office of Independent Oversight and Performance Assurance
TAN	Test Area North
UFSAR	Updated Final Safety Analysis Report
USQ	Unreviewed Safety Question

1.0 Introduction

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA) conducted an inspection of environment, safety, and health (ES&H) and emergency management programs at the U.S. Department of Energy (DOE) Idaho National Engineering and Environmental Laboratory (INEEL) site in August and September 2003. The inspection was performed as a joint effort by the OA Office of Environment, Safety and Health Evaluations and the Office of Emergency Management Oversight.

Background

The DOE Office of Nuclear Energy, Science and Technology (NE) is the lead program secretarial office for INEEL. As such, it has overall Headquarters responsibility for programmatic direction, funding of activities, and ES&H and emergency management at the site. The DOE Office of Environmental Management (EM) is responsible for certain decontamination and decommissioning (D&D) and environmental restoration projects at INEEL. At the site level, line management responsibility for INEEL operations and safety falls under the Manager of the Idaho Operations Office (ID). INEEL is managed and operated for DOE by Bechtel BWXT Idaho, LLC (BBWI), whose members include Bechtel National, Inc.; BWX Technologies Company; and a consortium of eight regional universities.

INEEL is a multi-purpose laboratory that performs work for NE, other DOE program offices, other Federal agencies, and work for others. INEEL activities include nuclear reactor technology research and development, waste management, D&D of facilities, environmental restoration, advanced energy production, defense-related support, technology transfer, and non-nuclear research and development projects. INEEL has experienced a significant increase in D&D and programmatic work in the past few years for a variety of reasons (e.g., D&D projects have been accelerated).

Aerial View of INTEC

INEEL consists of eight primary facilities situated on nearly 900 square miles in a rural, sparsely populated sector of high-desert terrain in southeastern Idaho. Site buildings and structures are clustered within these facilities, which are typically a few hundred acres in size and are usually separated from each other by large tracts of undeveloped land. In addition, DOE owns or leases laboratories and administrative offices in the city of Idaho Falls.

INEEL activities involve various potential hazards that need to be effectively controlled. These hazards include external radiation, radiological contamination, hazardous chemicals, and various physical hazards associated with facility operations (e.g., machine operations, high-voltage electrical equipment, pressurized systems, hoisting and rigging heavy loads, and noise). Significant quantities of radiological and chemical hazardous materials are present in various forms at INEEL.

INEEL organizations and programs are currently undergoing a significant transition. EM and NE are restructuring some aspects of their approach to line management of INEEL activities to provide for more clear lines of responsibility and direction. Correspondingly, ID will be reorganized to facilitate line management direction and oversight of the two major mission areas (i.e., environmental

management and research/technical support). ID plans to issue separate contracts for these two mission areas when the current contract period ends. BBWI is also reorganizing into two distinct entities to align with the two mission areas.

Throughout the evaluation of ES&H and emergency management programs, OA reviewed the role of DOE organizations in providing direction to contractors and conducting line management oversight of contractor activities. OA is placing more emphasis on the review of contractor self-assessments and DOE line management oversight in ensuring effective ES&H and emergency management programs. In reviewing DOE line management oversight, OA focused on the effectiveness of ID in managing the INEEL contractors, including such management functions as setting expectations, providing implementation guidance, allocating resources, monitoring and assessing contractor performance, and monitoring and evaluating contractor self-assessments. Similarly, OA focused on the effectiveness of contractor self-assessment programs, which DOE expects to provide comprehensive reviews of performance in all aspects of ES&H and emergency management.

ES&H Review Scope

The purpose of the ES&H portion of this inspection was to assess the effectiveness of selected aspects of ES&H management as implemented by INEEL under the direction of ID. The ES&H portion of the inspection was organized to evaluate four related aspects of the integrated safety management (ISM) program: (1) ID and BBWI implementation of selected ISM guiding principles, including efforts to address the new 10 CFR 830, Subpart B, requirements for design safety reviews for nuclear facilities and implementation of suspect/counterfeit item requirements; (2) ID and BBWI feedback and continuous improvement systems; (3) BBWI implementation of the core functions of safety management for various work activities; and (4) functionality of selected essential systems at the Advanced Test Reactor (ATR), including systems that mitigate loss of coolant accidents at the reactor and spent fuel pool (e.g., emergency feedwater coolant injection, primary coolant pump shutdown systems, and various support systems).

The OA inspection team used a selective sampling approach to determine the effectiveness of ID and BBWI in implementing DOE ES&H requirements. The approach involved examining selected institutional programs that support the ISM program and implementation of requirements at selected INEEL facilities and activities. The review of the core functions of safety management focused on specific facilities and activities, including construction and tank cleaning activities at the Idaho Nuclear Technology and Engineering Center (INTEC); D&D activities at Test Area North (TAN); and research activities at the INEEL Research Center (IRC). In reviewing these programs and activities, OA devoted particular attention to selected ES&H requirements, including work control processes; suspect/counterfeit item controls; subcontractor ES&H controls; radiological work planning and permits; assessment and control of contaminants (e.g., beryllium); injury and illness record keeping; hoisting and rigging requirements; and radiological controls.

INEEL Facility

Emergency Management Review Scope

The OA inspection team evaluated selected aspects of emergency planning, emergency preparedness, emergency response, and preparedness assurance. OA also conducted tabletop performance tests with a sample of the site's key decision-makers to evaluate their ability to employ available tools and skills when responding to postulated emergency conditions.

Organization of the Report

Section 2 provides an overall discussion of the results of the review of the INEEL ES&H and emergency management programs, including positive aspects and weaknesses. Section 3 provides OA's conclusions regarding the overall effectiveness of ID

and BBWI contractor implementation of ES&H and emergency management programs. Section 4 presents the ratings assigned during this review. Appendix A provides supplemental information, including team composition. Appendix B identifies specific findings that require corrective action and follow-up.

More detailed information on the inspection results is contained in two separate volumes of this report, which were provided to ID management and are available to other DOE sites on request. Volume I provides more detailed information on the results of the review of INEEL ES&H programs, and Volume II provides more detailed information on the results of the review of the INEEL emergency management program.

2.0 Results

2.1 Positive Attributes

Environment, Safety, and Health

Although a number of implementation deficiencies were observed, many aspects of ISM are effectively implemented at INEEL. Most work observed by OA was performed with a high regard for safety. As discussed below, some aspects of ID and BBWI ES&H programs are particularly effective.

INEEL has achieved improvements in worker safety and environmental performance indicators. In the past few years, work activities at INEEL have increased significantly as D&D efforts have been accelerated, and INEEL facilities are used to support over 25 major research and development customers. For example, INEEL has decommissioned over 29,000 square feet of buildings at TAN this year, removed 60 Three Mile Island spent fuel racks ahead of schedule, and completed some key construction projects ahead of schedule. During this time, INEEL achieved significant improvements in quantitative worker safety and environmental management performance indicators. In the worker safety arena, the total injury case rate, total recordable case rate, and lost workday case rate have decreased by 47 percent, 70 percent, and 43 percent, respectively, from 1999 to 2003. In the environmental protection arena, the number of environmental violations has decreased significantly. The development and maturation of ISM and other ES&H-related programs (e.g., Voluntary Protection Program and environmental management system) has contributed to the performance improvements. For example, INEEL has performed over 23,000 behavior-based safety observations under its Worker Applied Safety Program.

Many aspects of the BBWI ISM program are rigorous, comprehensive, and effectively implemented. Although some implementation weaknesses were identified, the ISM program at INEEL is mature, comprehensive, well designed, and well documented. Roles and responsibilities

Asbestos Abatement at TAN

are defined in detail in institutional documents and implementing procedures. The BBWI processes for managing requirements is comprehensive and effective and has several noteworthy aspects (procedures reference source requirements for each procedural step, a computer-based Requirements Management Tracking System, and assurance that workers receive the training on new procedures before issuance). The BBWI Integrated Assessment Program provides a systematic framework for analyzing assessment results, determining assessment priorities, and improving assessment processes. BBWI has been proactive in developing and implementing an environmental management system that is integrated into ISM. Suspect/counterfeit item requirements have been effectively addressed and integrated into ISM and facility procedures, including reporting processes.

The use of vacuum excavators and air-powered lances at TAN and INTEC efficiently and effectively reduces hazards associated with excavations. This practice provides a significant safety improvement over traditional excavation methods, particularly in the INEEL environment where underground surveys are not precise and facility drawings cannot be relied upon for accurate characterization of potential underground hazards. The air-powered lance loosens and disturbs the soil without forceful cutting action that may otherwise cause damage to unknown buried utilities. The methodology would be beneficial for consideration at other DOE sites.

A Vacuum Excavator

The Radiological Control Information Management System electronic radiological work permit system is used effectively as part of the site as-low-as-reasonably-achievable (ALARA) program to control entry into radiological areas and to track personnel and task-specific doses. The Radiological Control Information Management System is a radiological control records database management program. The site began using the system in 1997 and has periodically added features and/or improved the utility to workers and management. Currently, the system controls employee entries into radiological areas based upon employee radiological training, predefined ALARA controls, and administrative requirements. A bioassay tracking analysis and dose assignment database was added in 1999. A variety of user-defined reports can be easily produced to provide useful insights about effectiveness of work planning and radiological controls. The site is working to improve the system's work planning utility through seamless integration with the system currently used to generate individual work packages. While other sites use similar systems to manage radiological work permits and provide electronic access control to radiological areas, INEEL's use of the system to track individual exposures and restrict access to radiological areas based on expired training, cumulative dose, or other parameters are innovative practices that other DOE sites should consider.

Emergency Management

BBWI has implemented a comprehensive emergency management program that provides confidence that the emergency response organization can mount an effective response to a wide range of initiating events. While weaknesses were noted within several of the programmatic areas, as discussed on the following page, they should be viewed in the context of a fundamentally strong program. Positive attributes of the emergency management program are discussed below.

With very few exceptions, BBWI has implemented a rigorous and well-structured framework for the INEEL emergency management program. BBWI has established an

INEEL Communications and Dispatch Center

effective mechanism for developing and maintaining a consistent set of hazards surveys and hazards assessments (HAs) in the form of detailed procedures that include most of the elements required by a rigorous HA development process. Generally, the INEEL hazards surveys and HAs appropriately identify and characterize nearly all facility and site hazards, including transportation activities. BBWI institutional and facility-specific emergency planning and response documents, including plans, implementing procedures, and responder checklists, accurately describe all elements of the INEEL emergency preparedness program and establish a consistent set of expectations for emergency response.

The INEEL emergency management training, drill, and exercise program is comprehensive and well-defined, and it is used effectively to prepare emergency response organization (ERO) members for their emergency response duties, maintain proficiency, and identify areas for program improvements. BBWI has defined and effectively implemented a performance-based training and qualification program using a variety of instructional presentation and evaluation methods, including practical demonstrations of proficiency. The mature BBWI drill program is used to train new ERO members and help maintain ERO proficiency. INEEL exercises are appropriately structured, conducted, and documented

to validate the elements of the emergency management program and identify needed improvements. ID has defined an appropriate training and qualification program for ID management duty officers.

Key INEEL emergency responders demonstrated appropriate and conservative decision-making skills during tabletop performance tests, and the INEEL emergency response approach and level of preparedness have been validated during several recent events. Emergency operations center teams (which included the ID management duty officer position), emergency control center teams, and consequence assessment teams demonstrated a clear understanding of individual and team roles and responsibilities, worked effectively as teams, and were clearly sensitive to the concepts of conservative decision-making. Furthermore, INEEL demonstrated conservative and timely response to two recent facility emergencies involving drums of contaminated material.

Many aspects of the INEEL emergency management program have been improved since the 1998 OA emergency management review, and BBWI and ID are continuing to implement programmatic improvements. Since 1998, BBWI has implemented improvements in the rigor and quality of HAs, transportation emergency planning, and the accuracy and usability of emergency response procedures. The BBWI integrated assessment program is being used effectively to identify areas for improvement, and identified issues are being effectively resolved. BBWI's wildland fire preparedness program includes a comprehensive annual preparation process to ensure readiness for the range-fire season. ID efforts have resulted in significantly improved communication and coordination with cognizant state and local agencies, and the recently approved ID emergency management system manual clearly establishes emergency response and line management oversight roles and responsibilities for ID staff.

2.2 Program Weaknesses

Environment, Safety, and Health

Although INEEL has a mature ISM program, weaknesses were identified in some important aspects of ISM implementation at the facility and activity levels.

ID has not implemented the line management oversight process as defined in the approved oversight procedure. ID has adequately defined and documented responsibilities to reflect its new organization and approach to line management oversight. However, some line oversight processes are not yet effectively implemented. For example, the mechanism to translate findings by the Facility Representatives into corrective actions by the contractor is not currently functioning because the requisite oversight analysis teams have not been established. In addition, ID has not yet provided the training to ensure that responsibilities are communicated and understood, and it does not have a structured self-assessment program. Further, the quality of surveillances and assessments varies significantly.

Weaknesses in the ATR design analyses raise concerns whether the systems designed to mitigate loss-of-coolant accidents (LOCAs) adequately protect against all potential accident scenarios. The design weaknesses identified had one or more of the following attributes: (1) failure to consider all accident phenomena in the accident analyses, (2) insufficient analysis of some potential accidents, and (3) inadequate justification for assumptions relied on to support the accident analysis. The design weaknesses are exacerbated by weaknesses identified in the configuration management program (e.g., UFSAR and plant drawings are not maintained accurate), preventative maintenance program (e.g., vendor recommendations are not incorporated into the maintenance program), and one surveillance test (operability of firewater pump) that could adversely impact the reliability of the Emergency Firewater Injection System and LOCA primary coolant pump shutoff system. In worst-case scenarios, the systems may not function as intended to effectively mitigate a LOCA and prevent fuel damage. Notwithstanding a number of positive aspects, the identified design analysis weaknesses warrant a detailed evaluation of the specific concerns and a management review to determine why these concerns were not previously identified, including the underlying factors that may reduce the effectiveness of engineering evaluations and safety analyses.

INTEC and TAN field supervision and safety professionals have not ensured that work activities are performed within established hazard controls and requirements listed in work packages. Although most work observed was conducted in accordance with identified controls, the OA team identified unsafe work practices and safety deficiencies at the facilities inspected. Many instances of work were not conducted in strict compliance with procedural steps, work package requirements, posted controls, or other documented requirements, resulting

in potentially unsafe conditions. In several cases, weaknesses, combined with problems in identification and implementation of controls, led to stopping or pausing work in order to mitigate deficient conditions. The observed deficiencies indicate that supervisors and workers do not always ensure strict procedural compliance and sometimes make non-conservative decisions about how and when to apply procedural requirements or work package requirements and controls. In some cases, there is evidence of an overreliance on individual expertise and knowledge, without applicable reference to site procedures and requirements, resulting in unnecessary exposure to hazards.

Deficient Scaffold Construction

The level of rigor and formality applied to radiological hazards analyses at the Building 616 D&D project was not sufficient to demonstrate that all relevant radiological hazards were clearly analyzed and that corresponding controls were adequate. BBWI has not clearly evaluated the hazards associated with potential beta radiation dose to workers' extremities in a manner sufficient to demonstrate that existing controls in radiological work permits or ALARA reviews are adequate. In addition, BBWI has not developed a clear technical justification in internal dosimetry technical basis documents for not performing Strontium-90 urinalysis as part of the random whole body counting bioassay program at Building 616.

BBWI's independent hazard review (IHR) process does not sufficiently document IRC management expectations for some elements of planning and conducting research to ensure a consistent and adequate level of hazard review commensurate with the hazard and the complexity of the work being performed. The IHR process has been effective in integrating INEEL subject matter experts and peer reviews into the planning and conduct of research and development work conducted at the IRC laboratories. Although performance metrics for the IHR process are good, the IHR process lacks sufficient documentation in some areas. For example, the IHR process does not provide sufficient written guidance on when and how an existing IHR package should be revised, on the need for and use of procedures when conducting research activities, or how a graded approach to hazards analysis should be conducted. The IHR process relies on the collaborative judgment made by the research team to implement the appropriate management expectations without requiring that all expectations be documented. This people-based process can result in inconsistent outcomes and is vulnerable to schedule pressures and changes in personnel.

Emergency Management

Although the INEEL emergency management program is strong in many areas, weaknesses were noted in several HAs and the associated emergency action levels (EALs), which are used for event classification and protective action formulation. These weaknesses impact the rigor of the programmatic foundation and the accuracy and usability of some of the response tools employed by key ERO initial decision-makers. Concerns in the rigor of ID oversight were noted as well. Specific weaknesses are discussed below.

HA weaknesses collectively diminish the rigor of the foundation for the INEEL emergency management program. The process for developing hazards surveys and HAs does not address the evaluation of hazardous materials that do not have Code of Federal Regulations-published screening quantities. Thus, in several instances, hazardous materials stored in significant quantities, including explosives and sulfamic acid, were not evaluated for their potential toxicological impact on site workers and the public. Although the HAs have been significantly improved, they do not assess the full spectrum of events that could impact affected populations; analyze release barriers for available indications of barrier failure for use in EALs; or accurately determine the extent of emergency planning zones. In addition, in several instances, HA event analyses were incorrectly carried forward to the associated EALs, resulting in classification levels and predetermined protective actions that are non-conservative.

Weaknesses in the specificity of many EALs thresholds and some of the associated predetermined protective actions limit EAL usefulness in a high-stress environment. Some EALs do not adequately support consistent, accurate, and timely event classification and identification of protective actions because few EALs include measurable entry thresholds, even for events postulated at the Advanced Test Reactor, which is highly instrumented. In addition, in several instances, the predetermined protective actions are inconsistent with the EAL technical basis analyzed in the associated HA. Also, predetermined protective actions do not always include both a downwind distance and breadth to clearly define the affected area in which the stated protective action is applicable. Consequently, EALs may challenge initial decision-makers, particularly if used early in an event when the full capabilities of the ERO are not yet available to provide technical support. Several instances of event misclassification during tabletop performance tests can be attributed in part to these weaknesses.

The ID program for conducting line management oversight of the INEEL emergency management program is immature, and significant challenges exist to successful implementation. ID has not fully implemented a program for conducting line management oversight of the INEEL emergency management program. Although the recently-approved ID emergency management system manual effectively captures an appropriate set of roles, responsibilities, and guidance for overseeing the BBWI emergency management program, ID has not yet developed the implementation mechanisms necessary to ensure that the required activities will be appropriately performed. In addition, deficiencies exist in both the implementation of the ID issues management program and the use of the corrective action tracking system for emergency management issues. Furthermore, ID has not effectively addressed the longstanding inconsistency between the BBWI emergency management program and DOE Order 151.1A requirements regarding events that should be categorized as Operational Emergencies (not requiring further classification). Consequently, if a classifiable emergency occurs at INEEL, DOE Headquarters emergency response personnel might not understand that the event does not necessarily involve the airborne release of hazardous materials.

3.0 Conclusions

Environment, Safety, and Health

The ISM program at INEEL has continued to improve and mature. Many aspects of ES&H requirements are effectively implemented, and some aspects of ISM implementation are noteworthy. However, weaknesses in implementation of ISM are evident in a number of important areas, including the unreviewed safety question (USQ) process, ID line management oversight, and certain elements of BBWI implementation of ES&H requirements at the working level. In addition, deficiencies in the ATR essential systems will require extensive analysis to ensure an effective resolution.

D&D at TAN

ID and BBWI management are supportive of safety and understand and accept their line management responsibility. ID and BBWI have coordinated their efforts to establish an appropriate set of contractual requirements, and they have worked together to address 10 CFR 830, Subpart B, requirements. BBWI met the regulatory schedule milestones for submitting safety basis packages. ID has reviewed all submittals and approved the submittals for 12 nuclear facilities; 15 other submittals are still in the DOE review and approval process. BBWI has an effective process for identifying requirements and ensuring that they are clearly incorporated into working-level processes and procedures. Responsibilities and expectations are clearly defined at all levels of the BBWI organization. BBWI has effectively integrated suspect/counterfeit item requirements into facility procedures. Although there are some implementation weaknesses, BBWI has a well-documented assessment and issues management program and performs numerous assessments. In most respects, the BBWI ISM program documentation and structure are among the most rigorous, detailed, and mature in the DOE complex.

The ATR has several design deficiencies that were not adequately analyzed in the safety analysis. Weaknesses in configuration management, surveillance testing, and maintenance have the potential to further reduce the margin of safety. ID and BBWI decided to shut down the ATR to address a related design question on August 21, 2003. NE has been engaged in discussions with ID and BBWI regarding these potentially significant issues with the ATR . NE personnel recognize that resource limitations in past years may have contributed to some aspects of the deficiencies (e.g., not funding a design reconstitution). NE indicated that resource levels would be reexamined and that NE would increase its involvement in addressing ATR issues.

Many aspects of work that the OA team observed at INEEL were performed with a high regard for safety. With some exceptions, the work activities were well defined and the potential hazards were effectively identified and analyzed. In most cases, effective hazard controls were in place and effectively implemented. Some aspects of BBWI implementation of ES&H requirements are particularly rigorous and comprehensive. However, weaknesses were identified in the implementation of a number of hazard controls and procedures, and ES&H requirements were not always rigorously implemented at the working level. Facility management, supervisors, and ES&H personnel did not always take sufficient action to ensure that requirements were being effectively implemented. In addition, the USQ process at INEEL needs improvement to ensure that DOE requirements are correctly reflected and effectively implemented, and to prevent operations outside the authorized safety envelope. When viewed collectively, the implementation deficiencies identified for the specific facilities inspected indicate a need for increased rigor and

attention to detail in implementing ISM processes. The current lack of adequate ID line management oversight processes is another contributor to implementation deficiencies. The maintenance of a culture based on safely conducting work in accordance with approved procedures and work packages is a significant management challenge that must be continuously addressed to prevent erosion of the improvements realized from the ISM implementation efforts of the past several years.

The ID senior management team recognizes the need to address the current deficiencies in ID's implementation of responsibilities and establish individual and organizational accountability for effectively meeting mission objectives and management expectations. ID management also recognizes that there are significant challenges facing ID and INEEL, including the ongoing transition, reorganizations, major procurement efforts, recent reductions in funding and force, and the increased workload associated with accelerated site cleanup. ID is actively working on addressing such challenges and implementing its new approach to oversight.

Overall, the ISM programs at INEEL are mature and well structured and effectively address many of the potential hazards. However, there are deficiencies in several important aspects of the INEEL ISM including worker safety controls, adherence to requirements, the USQ process, and ID line management oversight. NE, ID, BBWI, and EM need to ensure that the deficiencies identified at the specific facilities reviewed are rigorously evaluated to determine root causes and recurrence controls. Because some of the deficiencies could have sitewide implications, management should direct assessments to determine whether similar deficiencies exist at other INEEL facilities. In addition, NE, ID, and BBWI recognize that the weaknesses in the ATR design analyses, configuration management, testing, and maintenance will require a detailed evaluation to determine their safety significance and the appropriate corrective actions. NE, ID, and BBWI should consider the following actions to ensure that root causes for the ATR weaknesses are identified and addressed:

- Perform an ATR design evaluation that addresses the full range of potential concerns and evaluates potential changes to ensure that the ATR can be safely shutdown in the event of a worst-case accident scenario.

- Communicate management's expectation for a safety culture that promotes a questioning attitude among the engineering staff and demands the rigor and attention to detail necessary to meet the quality engineering standards associated with an operating nuclear reactor.

- Review the level of historic and current resource allocations to ATR to ensure that future allocations are sufficient to address residual risk and sustain effective operations and maintenance.

Emergency Management

As reported in the May 1998 review of emergency management programs across the DOE complex, the OA team found that a sound and effective emergency management program was in place at INEEL. The 1998 review also identified several weaknesses in response implementing mechanisms, proficiency and depth of knowledge of some ERO members, and EM and ID involvement in line management oversight of the INEEL emergency management program. This inspection found that BBWI has made a sustained effort to maintain the program strengths, address most identified weaknesses, and implement further improvements across many program elements. In addition, both EM and ID have been more engaged in overseeing the INEEL program.

The BBWI emergency management program is characterized by an appropriate framework in the form of institutional and facility-specific emergency plans, a well-integrated set of response implementing procedures and ERO checklists, and a defined emergency planning hazards identification and assessment process. HAs, with some notable exceptions, appropriately identify the hazardous materials that need to be evaluated, assess the consequences of postulated events, and provide information necessary to develop emergency response procedures. Other elements of the BBWI program contain strengths as well. The training, drill, and exercise program is well-structured and is being used effectively to prepare ERO members for their emergency response duties and identify areas for program improvements. During tabletop performance tests, BBWI emergency response personnel demonstrated appropriate and conservative decision-making skills, which is an area showing significant improvement from the 1998 OA review. BBWI is effectively using self-assessments to implement

programmatic improvements, and ID has improved coordination with offsite response agencies. ID has also recently issued a manual to clearly define line management oversight and emergency response roles and responsibilities and ID ERO response functions.

Although the program is fundamentally strong, weaknesses were noted in several aspects of the HAs and EALs. A weakness in the hazards screening process resulted in some hazardous materials that are present in significant quantities at three INEEL facilities not being assessed for their potential impact on site workers and the public. HAs do not consider all of the event initiators necessary to adequately cover the range of potential accident scenarios, and the HAs do not accurately determine emergency planning zones. Furthermore, the EALs, which are used for event classification, do not always contain the necessary specificity in terms of implementation thresholds and predetermined protective actions. The collective consequence of these weaknesses is that in some cases, initial decision-makers may not have all of the tools necessary to ensure timely and accurate event classification and protective action dissemination in a high-stress environment. Finally, significant challenges exist for ID in implementing the program for conducting line management oversight of the INEEL emergency management program, and ID has not ensured that the BBWI event categorization and classification process is consistent with DOE requirements or sought an exemption from the cognizant Headquarters authority. This inconsistency means that Headquarters emergency response personnel may not have a clear understanding of the true severity of an INEEL-classified event.

Overall, BBWI has implemented a well-structured emergency management program that provides a high degree of confidence that site workers and the public will be adequately protected if a significant event occurs. This confidence is based on programmatic attributes, ERO performance during tabletop tests, and validation of the INEEL emergency response approach and level of preparedness during several recent events. The identified weaknesses in HAs and EALs will require sustained attention and a carefully-considered approach to correction, but overall, the program is strong, and BBWI and ID are continuing to implement improvements.

4.0 Ratings

The ratings reflect the current status of the reviewed elements of the INEEL ISM and emergency management programs.

Safety Management System Ratings
Guiding Principle #2 – Clear Roles and Responsibilities ..... EFFECTIVE PERFORMANCE
Guiding Principle #5 – Identification of Standards and Requirements ... EFFECTIVE PERFORMANCE

Feedback and Improvement
Core Function #5 – Feedback and Continuous Improvement ..... NEEDS IMPROVEMENT

Implementation of Core Functions for Selected Work Activities
Core Function #1 – Define the Scope of Work..... EFFECTIVE PERFORMANCE
Core Function #2 – Analyze the Hazards ..... EFFECTIVE PERFORMANCE
Core Function #3 – Develop and Implement Hazard Controls ..... NEEDS IMPROVEMENT
Core Function #4 – Perform Work Within Controls ..... NEEDS IMPROVEMENT

Essential System Functionality
Design and Configuration Management ..... SIGNIFICANT WEAKNESS
Surveillance, Testing, and Maintenance ..... NEEDS IMPROVEMENT
Operations ..... EFFECTIVE PERFORMANCE

Emergency Planning
Hazards Surveys and Hazards Assessments ..... NEEDS IMPROVEMENT
Program Plans and Procedures ..... EFFECTIVE PERFORMANCE

Emergency Preparedness
Training and Drills ..... EFFECTIVE PERFORMANCE
Emergency Response Exercises ..... EFFECTIVE PERFORMANCE

Emergency Response
INEEL Emergency Response Decision-Making ..... EFFECTIVE PERFORMANCE

Readiness Assurance
DOE Assessments and Performance Monitoring ..... NEEDS IMPROVEMENT
Contractor Assessments and Issues Management ..... EFFECTIVE PERFORMANCE

APPENDIX A
SUPPLEMENTAL INFORMATION

A.1 Dates of Review

Scoping Visit	June 3 - 5, 2003
Onsite Inspection Visit	August 11 - 22, 2003
Report Validation and Closeout	September 3 - 5, 2003

A.2 Review Team Composition

A.2.1 Management

Glenn Podonsky, Director, Office of Independent Oversight and Performance Assurance
Michael Kilpatrick, Deputy Director, Office of Independent Oversight and Performance Assurance
Patricia Worthington, Director, Office of Environment, Safety and Health Evaluations
Thomas Staker, Deputy Director, Office of Environment, Safety and Health Evaluations
Charles Lewis, Director, Office of Emergency Management Oversight

A.2.2 Quality Review Board

Michael Kilpatrick
Charles Lewis
Robert Nelson
Patricia Worthington
Dean Hickman

A.2.3 Review Team

Charles Lewis, Director, Office of Emergency Management Oversight (Team Leader)

ES&H
William Miller (Overall ES&H Lead)
Ali Ghovanlou (Management Systems Lead)
Robert Compton
Albert Gibson
Timothy Martin
Brad Davy (Core Functions Lead)
Mark Good
Joe Lischinsky
Jim Lockridge
Edward Stafford
Mario Vigliani
Jim O'Brien (Essential Systems Functionality Lead)
Michael Gilroy
Don Prevatte
Michael Shlyamberg

Emergency Management
Steve Simonson (Emergency Management Lead)
Jeff Robertson
Phillip Brenner
W. Steven Joiner
JR Dillenback
George Kitchen
Tom Rogers
Dave Schultz

A.2.4 Administrative Support

Lee Roginski
Tom Davis

APPENDIX B
SITE-SPECIFIC FINDINGS

Table B-1. Site-Specific Findings Requiring Corrective Action Plans

ES&H FINDING STATEMENTS
1. Idaho Operations Office (ID) and Bechtel BWXT Idaho, LLC (BBWI) have not ensured that the Idaho National Engineering and Environmental Laboratory (INEEL) unreviewed safety question process is effectively designed and implemented.
2. ID has not implemented the line management oversight process and issues management process, as defined in the approved oversight procedure, to ensure that important deficiencies are corrected and that ID self-assessment processes result in continuous improvement.
3. The level of rigor and formality applied to radiological hazards analyses at the Building 616 decontamination and decommissioning project was not sufficient to demonstrate that all relevant radiological hazards were clearly analyzed and that corresponding controls were adequate.
4. MCP-3571, *Independent Hazard Review*, and other related documents do not sufficiently document INEEL Research Center management expectations for some elements of planning and conducting research to ensure a consistent and adequate level of hazard review commensurate with the hazard and the complexity of the work being performed.
5. Idaho Nuclear Technology and Engineering Center and Test Area North field supervision and safety professionals have not ensured that work activities are performed within established hazard controls and requirements listed in work packages.
6. Some potential accidents and accident phenomena have not been adequately analyzed and documented to provide assurance that Advanced Test Reactor (ATR) safety systems are capable of mitigating loss-of-coolant accidents in accordance with the ATR updated final safety analysis report (UFSAR).
7. The U.S. Department of Energy (DOE) has not supported and BBWI has not implemented an effective configuration control program to ensure that the ATR design meets all technical and procedural requirements as required by PRD-115, *Configuration Management.*
8. BBWI has not established a technically adequate surveillance program for testing the operability of the ATR firewater pumps as required by technical safety requirement (TSR) limiting conditions for operations (LCO) 3.2.1.2, surveillance requirement 4.2.1.2.8, and UFSAR Chapter 14.
9. BBWI has not implemented the American Society for Mechanical Engineering (ASME) Section XI inspection requirements for the Emergency Firewater Injection System check valves specified in the in-service inspection plan referenced in UFSAR Chapter 14.

Table B-1. Site-Specific Findings Requiring Corrective Action Plans (continued)

EMERGENCY MANAGEMENT FINDING STATEMENTS
1. BBWI has not ensured that all hazardous materials are identified and assessed for potential impact on site workers and the public, as required by DOE Order 151.1A, *Comprehensive Emergency Management System.*
2. BBWI has not fully analyzed an appropriate spectrum of emergency events and conditions; assessed available indicators of barrier failures for use in emergency action levels (EALs); or appropriately determined the extent of emergency planning zones, as required by DOE Order 151.1A.
3. Many BBWI EALs do not contain an appropriate set of measurable implementation thresholds that ensure that event classifications are timely and accurate, as required by DOE Order 151.1A.
4. ID has not ensured that the BBWI event categorization and classification process is consistent with DOE Order 151.1A or sought an exemption in accordance with the process described in DOE Order 151.1A.

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