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**Integrated Safety Management System Verification  
Phase I and Phase II (Construction Department)  
River Protection Project Waste Treatment Plant**

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**February 2003**

**VOLUME I**

**U.S. Department of Energy  
Office of River Protection**

**I, by signature here, acknowledge that I concur with the TEAM LEADER and SENIOR ADVISOR in the issues and conclusions of this Integrated Safety Management System Verification Report in my assigned functional area.**

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## EXECUTIVE SUMMARY

The Department of Energy (DOE) commits to accomplishing its mission safely. To this end, contractors must integrate safety into management and work practices at all levels so that programs, processes, and objectives are achieved while protecting the public, the worker, and the environment. The contractor is required to describe the integrated safety management system to be used to implement safety performance objectives. To ensure these objectives are met, the Department issued DOE Policy (P) 450.4, *Safety Management System Policy*, and DOE Acquisition Regulations (DEAR). DEAR 48 CFR 970.5204-2 and -78 require contractors to manage and perform work in accordance with a documented, site-specific Integrated Safety Management System (ISMS). These ISMS requirements have been incorporated into Bechtel National, Inc. (BNI's) contract with DOE (DE-AC27-01RV14136) to design, construct and start-up facilities to transform liquid radioactive waste to a stable glass form using the vitrification process.

This report documents the results of the Phase I and Phase II (Construction Department) ISMS Verification Review conducted to: (1) verify the adequacy of the BNI ISMS Description document, including supporting Environmental, Safety, & Health system documents, in fulfilling the requirements of the DEAR clauses, DOE directives contained in the contract, and DOE ISM policy; and (2) verify the implementation of ISMS policies and procedures within the BNI Construction Department. The report also discusses the role of the DOE Office of River Protection (ORP) in support of BNI's ISMS. The report includes a recommendation to the Manager, ORP as to the acceptability of the ISMS Description document and provides details on the status of ISMS implementation within the BNI Construction Department. The report identifies both noteworthy practices and opportunities for improvement.

The ISMS Phase I and Phase II (Construction Department) Verification Review was performed in accordance with the protocol outlined in DOE HDBK 3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook*. The review team developed a detailed Verification Review Plan to guide the review. The team was divided into six functional area teams: Business, Budget and Contracts; Management; Hazard Identification and Standards Selection; Operations (Construction); DOE; and Subject Matter Experts (Training, Quality Assurance, Industrial Safety/Industrial Hygiene, and Configuration Management). Functional area reviews were conducted using Criteria and Review Approach Documents (CRADs) based on the Core Functions and Guiding Principles from the DOE Policy and associated guide. Completed CRAD forms and the Verification Review Plan are included in Volume II of this report.

## CONCLUSIONS

BNI demonstrated a strong commitment to safety and the concept of Integrated Safety Management at the senior management levels of the project and at all levels of the Construction Department. These same levels of the organization were knowledgeable of the functions and principles of ISM. The documents reviewed, personnel interviewed, and the activities observed during the ISMS Verification Review confirmed that the principles and functions of ISM are integrated into work planning and work execution within the BNI Construction Department.

BNI line management roles and responsibilities are clearly defined to include their responsibility for safety. Senior project managers and managers at all levels of the Construction Department participate in the safety process and demonstrated competence in the execution of their safety responsibilities. Within the Construction Department, clear roles and responsibilities were defined and construction craft demonstrated knowledge of their responsibilities.

The Verification Team examined hazard management processes used for the development and implementation of the project Authorization Basis and for safe construction practices. Hazards are dealt with effectively at both the project level and at the construction site. Through DOE directives and BNI implementing procedures, all hazards (nuclear, process safety, industrial safety and environmental) are identified, analyzed and controlled.

The feedback and improvement portion of BNI's ISMS consists of a myriad of small, isolated, computerized systems used to perform specific functions for specific managers. Some of these systems are more effective than others, based on visibility by senior managers and/or effectiveness of the manager using the system. This Verification Report highlights some effective and useful systems, but identifies others as not useful or relegated to low priority so that commitment dates are not being met. The project needs a coordinated system with sufficient controls that will provide status to senior managers so they can allocate adequate resources to this important improvement process.

During the Phase II portion of this review, the areas of Configuration Management, Industrial Health/Industrial Safety, Quality Assurance and Training (Construction) were reviewed with respect to Construction Department activities. Although opportunities for improvement were noted, BNI is commended for the strong safety culture instilled in the construction crafts at the work site.

The DOE ORP has developed the basic programs and procedures necessary to implement an ISM system for the organization as it relates to the Waste Treatment Plant (WTP). The ORP ISMS is also well integrated and supportive of the BNI ISMS. The development of a comprehensive Quality Assurance procedure for ORP's business and contract management and development of industrial safety and health inspection protocols were found to be noteworthy. While ORP has put ISM systems in place and is implementing them, there are several opportunities for improvement in the implementation of feedback and improvement mechanisms.

The BNI ISMS Description Document, procedures, and mechanisms meet the requirements of DOE P 450.4 and the DEAR clause. Some opportunities for improvement were identified. The Verification Team recommends that the Manager, ORP approve the ISMS Description and ensure that the changes necessary to correct identified deficiencies be included in the next ISMS Description update. The Verification Team further concluded that ISMS is implemented within the BNI Construction Department.

Noteworthy practices and opportunities for improvement are summarized on the following pages and are discussed in detail in Section 6 of this report.

## Noteworthy Practices

### Bechtel National, Inc.

- HAZ I-2.2: The Project Constructability Program is exemplary in tracking issues between engineering and the field.
- MAN II-1.1: An active safety culture is evident at all levels of the construction organization.
- MAN II-1.2: Site management demonstrated experience and competence in their areas of responsibility.
- MAN II-2.1: The Dry Run process is an effective feedback and improvement tool.
- OPS II-1.2: The Area Organization concept for the project instills “ownership” for each Area Team and allows them to plan, organize, and execute each field activity in a safe and efficient manner.
- IS/IH II-1.2: Personnel Protective Equipment is consistently worn and properly utilized by the construction workforce.

### Department of Energy

- DOE I-2.2: The creation and implementation of a comprehensive Quality Assurance (QA) program for business and contract management is noteworthy.
- DOE II-1.1: The comprehensive nature and level of detail of ORP’s formal industrial safety and health inspection protocols are considered noteworthy.

## Opportunities for Improvement

### Bechtel National, Inc.

- MAN I-1.1: The ISMSD does not describe: (1) the implementing mechanism for Industrial Health and Safety reviews by Safety Assurance; or (2) the Safety/Quality Council mechanism.
- MAN I-1.2: All safety commitments are not consistently tracked in a proceduralized issues tracking system. One of the current systems (RITS) does not have the features needed for an effective issues management system able to support project activities, including commissioning.
- MAN I-3.1: The project lessons learned database system is marginal based on its limitations. The present system is being provided inputs from a small number of sources. The database of lessons learned has limited search capability. These limitations prevent the present system from being adequate to support the WTP.
- MAN I-3.2: At the time of this review performance measures and goals have not yet been sufficiently developed and submitted for DOE approval per the WTP Project Integrated Safety Management System Description.
- HAZ I-2.1: One non-conformance report from the field was found to be dispositioned use-as-is without sufficient documented justification in the record.

- MAN II-2.2: The implementation of an effective site Lessons Learned Program is not complete.
- OPS II-1.1: The frequency at which work crews should be briefed on Job Hazard Analyses (JHAs) has not been clearly established.
- CONF II-1.1: Design engineers and field engineers knowledge of the Field Change Notice process and its constraints is inadequate.
- CONF II-1.2: Configuration management training developed for project engineering should be extended to field engineering personnel.
- QA II-1.1: Roles and responsibilities for the Area Quality Assurance Representatives and the Quality Control Inspectors need to be clearly defined.
- QA II-1.2: Feed back into the Quality Assurance process needs to be more formalized.
- IS/IH II-1.1: A Fire Protection Engineer should be added to the Safety and Health Organization to help strengthen site operations.

### **Department of Energy**

- DOE I-1.1: ORP has not provided clear direction to the WTP contractor for the development of Performance Objectives, Performance Measures and Commitments (POMC) and the annual review and renewal of WTP POMC in accordance with the DOE ISM DEAR clause.
- DOE I-2.1: ORP has not fully implemented its lessons learned program and should aggressively promote the identification and use of lessons learned.
- DOE II-2.1: The criteria developed for ORP quality trend reports have not been sufficient to produce meaningful trends and lessons-learned information sufficient to drive continuous improvement.
- DOE II-2.2: ORP's self-assessment efforts have mostly been informal, not formally scheduled and tracked, results not documented, and improvement actions have not been documented in the Corrective Action Reporting System (CARS) as required by both the ORP QA and management assessment requirements, or in line with DOE QA guidance.

# INTEGRATED SAFETY MANAGEMENT SYSTEM VERIFICATION RIVER PROTECTION PROJECT WASTE TREATMENT PLANT

## 1.0 INTRODUCTION AND BACKGROUND

U.S. Department of Energy (DOE) policy requires the Department and its contractors to systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. Contractors must manage and perform work in accordance with an approved, documented, site-specific Integrated Safety Management System (ISMS). ISMS verification reviews are conducted to review ISMS documentation and system implementation and provide recommendations to the approval authority.

### 1.1 Site/Facility Description

DOE's 586 square-mile Hanford Site is located on the Columbia River in southeastern Washington State. DOE has two offices at Hanford: the Richland Operations Office and the Office of River Protection. The Office of River Protection (ORP) was established in 1998 to manage DOE's River Protection Project (RPP). The RPP mission is to build and operate a waste treatment complex to clean up Hanford's highly radioactive tank waste in a safe, environmentally sound, and cost-effective manner. In December 2000, DOE awarded a 10-year, \$4 billion contract to Bechtel National, Inc. (BNI) as prime contractor for the design, construction and start-up of facilities to transform liquid radioactive waste to a stable glass form using the vitrification process.

### 1.2 Integrated Safety Management System

DOE Policy, DOE P 450.4, *Safety Management System Policy*, states, "The Department and Contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. This is to be accomplished through effective integration of safety management into all facets of work planning and execution. In other words, the overall management of safety functions and activities becomes an integral part of mission accomplishment." Simply stated, it is the DOE's policy that safety is integrated into all aspects of the management and operations of its facilities.

The DOE Acquisition Regulations (DEAR 48 CFR 970.5204-2 and -78) require contractors to manage and perform work in accordance with a documented, site-specific ISMS. These requirements were incorporated into BNI's contract (DE-AC27-01RV14136). The contract requires BNI to submit a documented ISMS Description to ORP for approval. On September 18, 2002, BNI submitted ISMS Description 24590-WTP-ISMSD-ESH-01-001, Rev. 0, to ORP. Rev. 1 was submitted on January 30, 2003. ORP provided authorization for BNI to implement the ISMS Description pending the results of a verification review.

The Manager, ORP appointed Larry Hinson as Team Leader for the verification review by memorandum dated December 18, 2002 (included in Volume II). The tasking memorandum specified the scope of the review and the requested deliverables. This report is a formal record of that review and identifies both noteworthy practices and opportunities for improvement.

## 2.0 PURPOSE

A combined Phase I and Phase II (Construction Department) ISMS Verification Review was conducted. The Phase I ISMS Verification was conducted to provide the Manager, ORP with a recommendation regarding the approval of the BNI ISMS. The Phase II verification was conducted to determine whether the procedures and mechanisms described in the ISMS Description Document were effectively implemented within the BNI Construction Department. The review also evaluated the role of ORP in support of BNI's ISMS.

This report discusses the adequacy of the description document, supporting program and process documents, and ISMS implementation within BNI, and recommends whether the ISMS Description Document should be approved by ORP. It describes noteworthy practices and opportunities for improvement in implementation of ISMS within the BNI Construction Department. The report also discusses ORP procedures, policies and other interfaces relative to the BNI ISMS.

## 3.0 SCOPE

The scope of the Phase I ISMS Verification was to verify that BNI met the letter and intent of DOE policies in BNI's ISMS Description, supporting processes, and associated documentation. The ISMS Description, including supporting documentation and site Environment, Safety & Health system information, were evaluated to determine whether they met the requirements set forth in 48 CFR 970.5204-2 and -78, DOE P 450.4, and DOE P 450.5, *Line Management, Safety and Health Oversight*. As part of the verification process, the Team evaluated how BNI procedures, policies, and manuals were implemented at the upper levels of management. In assessing the adequacy of BNI's ISMS Description document, the Verification Team considered self-assessments, gap analyses, corrective action plans, and ISM implementation plans. By reviewing supporting processes and mechanisms, documents, corrective actions and implementation plans, the Verification Team was able to draw conclusions as to the adequacy of BNI's ISMS Description document. This approach also enabled the Team to assess the adequacy of the implementing and integrating mechanisms of ISMS. The scope of the review included all nine Phase I Core Expectations set forth in DOE Handbook 3027-99, *Integrated Safety Management Systems (ISMS) Verification Team Leader's Handbook*.

The scope of the Phase II ISMS Verification was to verify effective implementation of ISMS within the BNI Construction Department. The Phase II verification focused on implementation of integrated processes for accomplishing construction work safely. Through evaluation of work planning, control, feedback and improvement, the Verification Team was able to evaluate the effectiveness of ISMS implementation. The scope of the review included all eight Phase II Core Expectations set forth in DOE Handbook 3027-99.

In addition to reviewing BNI's ISMS documentation, processes, and mechanisms, the Verification Team also evaluated how well the ORP implemented its responsibilities related to ISM and the establishment of BNI's ISMS. ORP's ISM-related functions, responsibilities, and authorities are delineated in ORP M 411.1-1, Rev. 1, *ORP Safety Management Functions, Responsibilities and Authorities Manual* (December 14, 2001);

DOE/ORP-2000-06, Rev. 2, *RPP Project Management Plan* (October 30, 2001); and ORP M 450.4, Rev. 0, *ORP Integrated Safety Management Plan* (August 14, 2002).

#### **4.0 PREREQUISITES**

The significant prerequisites for the ISMS verification were that the BNI ISMS Description Document be prepared and submitted to ORP, and that supporting company level procedures and processes be in place and used within the BNI Construction Department.

#### **5.0 OVERALL APPROACH**

The ISMS Verification Team reviewed the BNI ISMS Description (Rev. 0 and Rev. 1) submitted to the Manager, ORP for approval. The Verification Team evaluated the description, supporting procedures and processes, manuals of practice, and implementation plans against the ISM guiding principles and core functions defined in DOE P 450.4. Based on this assessment, the Verification Team drew conclusions and provided recommendations to the Manager, ORP as to whether the BNI ISMS achieved the overall objective of Integrated Safety Management.

The Verification Team also evaluated implementation of the described system within the BNI Construction Department and the portion of ORP with line and staff responsibility for BNI operations.

The ISMS Phase I and Phase II (Construction Department) Verification Review was performed in accordance with the protocol outlined in DOE Handbook 3027-99. The Team developed a detailed Verification Review Plan to guide the review (included in Volume II of this report). To conduct the review, the Team was divided into six functional area review teams: Business, Budget and Contracts; Management; Hazard Identification and Standards Selection; Operations (Construction); DOE; and Subject Matter Experts (Training, Quality Assurance, Industrial Safety/Industrial Hygiene, and Configuration Management). Functional area reviews were conducted using Criteria and Review Approach Documents (CRAD) based on the Core Functions and Guiding Principles from the DOE Policy and associated guide. Completed CRAD forms are included in Volume II of this report.

#### **6.0 ISMS EVALUATION RESULTS**

##### **6.1 System Description**

The Integrated Safety Management System Description (ISMSD) document is consistent and responsive to DEAR 48 CFR 970.5204-2 and – 78, DOE policies and the direction provided to the contractor. The ISMS Description provides a link to the contractors implementing procedures and processes through the use of matrices. Two improvements were noted for the system description: (1) identify the implementing mechanism for Safety Assurance industrial health and safety reviews in the design process, and (2) include a description of the Safety/Quality Council's role in the feedback and improvement function. The team recommends the Manager, ORP approve the ISMS description and ensure that the changes necessary to correct identified deficiencies be included in the next ISMS Description update.

### **Issues/Opportunities for Improvement**

- MAN I-1.1: The ISMSD does not describe: (1) the implementing mechanism for Industrial Health and Safety reviews by Safety Assurance; or (2) the Safety/Quality Council mechanism.

### **Noteworthy Practices**

None.

## **6.2 Principles and Functions**

### **Line Management Responsibility for Safety**

The contractor's ISMSD and Integrated Safety Management Plan identify that line management is responsible for safety. These responsibilities are then flowed down into procedures for specific project areas.

Various planning groups and committees formed to oversee and plan key project functions are chaired by line managers and fully integrate all segments of the project. Safety is clearly a top priority for these project groups. This was demonstrated in meetings attended during the verification process.

Construction management personnel, from the highest levels of senior management to first line supervisors, displayed a genuine sense of responsibility for safety at the site that was reflected in their actions toward their employees. They are actively involved in the field engaged in identifying and resolving safety issues and concerns. An active safety culture was evident throughout the verification review.

The recent ORP reorganization and development of a project execution plan serve to reinforce DOE line management authority for assuring safety and health of workers and the public.

### **Issues/Opportunities for Improvement**

None.

### **Noteworthy Practices**

- DOE I-2.2: The creation and implementation of a comprehensive Quality Assurance (QA) program for business and contract management is noteworthy.
- MAN II-1.1: An active safety culture is evident at all levels of the construction organization.
- MAN II-1.2: Site management demonstrated experience and competence in their areas of responsibility.

### **Clear Roles and Responsibilities**

The ISMSD includes detailed matrices of procedures implementing each core function for the major areas of the project. The major areas of the project generally follow organizational lines and assist in identifying clear roles and responsibilities.

The Quality Assurance Manual provides specific roles and responsibilities for the Senior Project Management positions. Management levels below senior management are defined in local procedures and include specific roles and responsibilities. One issue in

this area addresses the inadequate definition of roles and responsibilities for the Area QA Representatives and Quality Control Engineers.

ORP has established a comprehensive set of procedures to identify appropriate roles and responsibilities for the federal staff. The overall functions, responsibilities, authorities manual has been drafted to reflect the reorganized staff.

### **Issues/Opportunities for Improvement**

- QA II-1.1: Roles and responsibilities for the Area QA Representatives and the Quality Control Inspectors need to be clearly defined.

### **Noteworthy Practices**

- OPS II-1.2: The Area Organization concept for the project instills “ownership” for each Area Team and allows them to plan, organize, and execute each field activity in a safe and efficient manner.

### **Competence Commensurate with Responsibilities**

Project interviews demonstrated a high degree of experience and background qualification for senior and middle management. Indoctrination and training is appropriate and responsive to project needs. A past project deficiency regarding the production and processing of Engineering Calculations Documents involved training deficiencies. Root cause analysis identified the problems, and new procedures and training have been executed and appear to have helped solve the problem.

Procedures require personnel assigned to the construction site to have the required skills, knowledge, and abilities to do their assigned tasks safely. Formal education, apprenticeship programs, orientation training, and task specific training are used to ensure personnel have an adequate level of competence. Most training classes require some testing to demonstrate that the training has been successful. Some training and qualification programs require the satisfactory demonstration of competence for the person to become qualified.

All project organizations were reviewed during the verification for competence commensurate with responsibilities. With two exceptions, personnel were found to be trained and qualified to perform their jobs. Knowledge of the Field Change Notice process and constraints needs improvement and construction personnel involved in implementation of the Configuration Management process should be more knowledgeable of the concept.

Procedures established by ORP assure federal personnel are properly trained and technically qualified for their assigned duties. ORP personnel interviewed had requisite experience, education, and training to perform effectively.

### **Issues/Opportunities for Improvement**

- CONF II-1.1: Design engineers and field engineers knowledge of the Field Change Notice process and its constraints is inadequate.
- CONF II-1.2: Configuration management training developed for project engineering should be extended to field engineering personnel.

- IS/IH II-1.1: A Fire Protection Engineer should be added to the Safety and Health Organization to help strengthen site operations.

### **Noteworthy Practices**

None.

### **Define Scope of Work/Balanced Priorities**

Interviews with BNI managers demonstrated their understanding of assigning resources, integrating safety into work scope, and allocating resources to achieve balanced priorities. Procedures and out-year planning documents adequately address resource assignment consistent with balanced priorities.

DOE and contractor procedures ensure that missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated. There is adequate DOE involvement in defining work scope, and in translating mission requirements into BNI performance objectives. DOE personnel roles, responsibilities, and authorities are appropriate to support ISMS.

Interviews with BNI managers indicate good understanding of ISMS implementation, and that safety is adequately incorporated into budgets. Review of procedures and subcontractor files indicate that appropriate ISMS requirements are flowed down to subcontractors. BNI performance objectives are approved and tracked.

Overall, DOE and contractor budgeting and resource assignment procedures include a process to ensure balanced priorities, and allocation of resources to address safety considerations, including protecting the public, workers, and environment whenever activities are planned and performed.

ORP defines the work scope through the contract and has developed mechanisms to evaluate designs, standards selection, and other contract changes to ensure safety, environmental issues, and the cost/schedule impacts are all evaluated and considered.

### **Issues/Opportunities for Improvement**

None.

### **Noteworthy Practices**

None.

### **Identify, Analyze, Control Hazards**

Contractor procedures require identification, analysis, and categorization of all hazards associated with facilities or activities. Hazards reviewed include nuclear, chemical, industrial or others applicable to the work being considered. The Preliminary Safety Analysis Report (PSAR) contains a General Chapter and individual chapters covering each of the Waste Treatment Plant (WTP) Nuclear Facilities; the Pre-treatment (PT) Facility, the High Level Waste (HLW) Facility, the Low Activity Waste (LAW) Facility and the Laboratory Facility. This Safety Analysis is prepared in accordance with DOE directives and provides the detailed designation of project systems, structures and components that are important to safety.

Procedures governing the transition process between design and construction provided adequate assurances that the hazards identified that resulted in important to safety controls were retained throughout transition. The work planning and execution process used during construction activities at the WTP project clearly calls out requirements for the identification and control of hazards associated with the actual construction of the WTP.

The contractor procedures implementing the directives in the ISMSD ensure controls are tailored to the hazards associated with the work or operations to be authorized and they ensure the identified controls, standards, and requirements are agreed upon and approved prior to the commencement of the operations or work being authorized.

Procedures and mechanisms for the Industrial Safety and Industrial Hygiene areas have adequate planning of individual work items to ensure that hazards are analyzed and controls are identified. Required controls are implemented by the use of JHA(s) and the Safety Task Analysis Risk Reduction Talk (STARRT) Card(s). Safety controls are implemented wherever possible and as allowed by the specific job task. Engineered controls are used where possible but due to the constant changing of the job tasks and hazards, there is strong reliance on personal protective equipment (PPE).

The ORP is implementing a rigorous “regulatory” approach to ensure WTP hazards are identified, analyzed and appropriate controls are put in place.

#### **Issues/Opportunities for Improvement**

- HAZ I-2.1: One non-conformance report from the field was found to be dispositioned use-as-is without sufficient documented justification in the record.

#### **Noteworthy Practices**

- HAZ I-2.2: The Project Constructability Program is exemplary in tracking issues between engineering and the field.

#### **Identification of Safety Standards and Requirements**

Safety standards and requirements have been established for the design of the WTP through the WTP contract and DOE approved Safety Requirements Document. ORP has processes in place to review proposed changes to the established standards to ensure the changes will continue to address the analyzed hazards.

BNI has implemented an ISMS that uses these standards exclusively to run the project and construct the plant systems. A change control process is in place to track and gain required approval for any changes to standards or requirements.

#### **Issues/Opportunities for Improvement**

None.

#### **Noteworthy Practices**

None.

### **Operations/Construction Authorization**

Construction Authorization is achieved through implementation of the procedure that describes Construction Work Packages. Work is scheduled and various preparation checks are conducted prior to commencing work, such as material availability, design changes, and changing conditions that could affect safety. Pre-job briefings are always conducted with all involved workers prior to commencing work that covers the work scope, analyzed hazards and controls, and the applicable JHA.

ORP actively participates in the review and approval of construction authorizations, and maintains extensive documentation as different levels of construction authorization are authorized.

### **Issues/Opportunities for Improvement**

- OPS II-1.1: The frequency at which work crews should be briefed on JHAs has not been clearly established.

### **Noteworthy Practices**

None.

### **Perform Work Within Controls**

Construction Work Packages include required job controls. Area safety engineers are assigned to each Area Superintendent and assist in the development of construction hazard controls and help ensure that work being performed is within these identified controls. The Project currently has an excellent safety record and all observed field work was within requirements.

DOE line oversight of the WTP is provided by ORP through daily management interfaces with BNI management, a comprehensive set of scheduled assessments and inspections, and daily facility representative surveillance.

### **Issues/Opportunities for Improvement**

None.

### **Noteworthy Practices**

- IS/IH II-1.2: PPE is consistently worn and properly utilized by the construction workforce.
- DOE II-1.1: The comprehensive nature and level of detail of ORP's formal industrial safety and health inspection protocols are considered noteworthy.

### **Feedback and Continuous Improvement**

The QA procedures clearly define and require feedback mechanisms like trending, self assessments, assessments and surveillances, and corrective action effectiveness evaluations. Feedback and improvement programs and mechanisms were reviewed during the verification. Some notable strengths in the program are:

- The practice of collecting STARRT Cards from the job site by the supervisor and forwarding them to the Safety Assurance Office at the end of each shift or completion

of the work task for review for area wide improvement items or other corrective actions.

- The Construction Dry Run process is an effective feedback and improvement tool.
- The Safety Education Through Observation (SETO) process provides feedback to individual workers on hazards caused by their unsafe behaviors.
- The Constructability Program was found to be a noteworthy practice in improving safety and cost-effectiveness.

The following problems were identified with feedback and improvement programs:

- Adequate evidence was not found that the QA program effectively gathered information, evaluated the information using a systematic approach, and then used the information to help direct the QA program to be more effective.
- The implementation of an effective site Lessons Learned Program was not complete.
- The project lessons learned database system was marginal based on its current limitations. These limitations prevent the present system from being adequate to support the WTP.
- The majority of the corrective actions on the Safety Action Tracking System were observed to be overdue.
- At the time of this review performance measures and goals identified in procedures have not yet been sufficiently developed and submitted for DOE approval per the WTP Project ISMSD.

ORP has established feedback and improvement procedures for its operations, but has not fully implemented them in the area of self-assessment and the identification of trends and lessons learned.

### **Issues/Opportunities for Improvement**

- MAN II-2.2: The implementation of an effective site Lessons Learned Program is not complete.
- MAN I-1.2: All safety commitments are not consistently tracked in a proceduralized issues tracking system. One of the current systems (RITS) does not have the features needed for an effective issues management system able to support project activities, including commissioning.
- MAN I-3.1: The project lessons learned database system is marginal based on its limitations. The present system is being provided inputs from a small number of sources. The database of lessons learned has limited search capability. These limitations prevent the present system from being adequate to support the WTP.
- MAN I-3.2: At the time of this review performance measures and goals identified in procedures have not yet been sufficiently developed and submitted for DOE approval per the WTP Project Integrated Safety Management System Description.
- QA II-1.2: Feed back into the QA process needs to be more formalized.
- DOE I-1.1: ORP has not provided clear direction to the WTP contractor for the development of Performance Objectives, Performance Measures and Commitments (POMC) and the annual review and renewal of WTP POMC in accordance with the DOE ISM DEAR clause.

- DOE I-2.1: ORP has not fully implemented its lessons learned program and should aggressively promote the identification and use of lessons learned.
- DOE II-2.1: The criteria developed for ORP quality trend reports have not been sufficient to produce meaningful trends and lessons-learned information sufficient to drive continuous improvement.
- DOE II-2.2: ORP's self-assessment efforts have mostly been informal, not formally scheduled and tracked, results not documented, and improvement actions have not been documented in CARS as required by both the ORP QA and management assessment requirements, or in line with DOE QA guidance.

#### **Noteworthy Practices**

- HAZ I-2.2: The Project Constructability Program is exemplary in tracking issues between engineering and the field.

### **6.3 Project ISMS Implementation Issues**

During the course of the Phase I review for the project, several items were identified regarding the quality of implementation of some feedback processes. Although these items were outside the scope of this Verification Review, they are provided here to enable BNI to initiate corrective action.

- The Management assessment scheduled was reissued multiple times to account for slips in execution.
- All levels of corrective actions need increased emphasis as evidenced by the following:
  - Many safety issues show overdue in tracking systems.
  - Reasons for due dates being extended or no action being taken are not entered.
  - A BNI response to a DOE finding did not address the original issue.

### **7.0 LESSONS LEARNED**

This review was unique in that the review was conducted as an early review of a large project as it started construction. The project has not completed all the nuclear design activities. Therefore, the review was conducted as a Phase I ISMS verification on the overall project and as a Phase II review of the construction activities only. Standard objectives and criteria were used, with some modifications in criteria. For example, the areas of Fire Protection and Chemical Safety were addressed as part of the Phase I design activities rather than in the Phase II Subject Matter Expert review. With this background, the following issues were considered important to the successful completion of this review:

- The time invested in the pre-assessment briefings by DOE and BNI was invaluable.
- The tour of the site as part of the pre-assessment activities was necessary to understand the environment and feel of construction activities.
- Due to the nature of the review, specific functional area briefs to team members on their assigned areas would have been beneficial. This would have enabled them to modify their CRADs more effectively and develop better lines of inquiry.

- It is important to allow sufficient time for CRAD modification. The half-day allowed for CRAD modification during the pre-assessment site visit for this review was too short.
- Selection of knowledgeable team members provided the flexibility needed to conduct a thorough review despite the issues described above.