Department of Energy
Washington, DC 20585

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December 11, 2002

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

The purpose of this letter is to inform you that we have completed our review of CH2M Hill Hanford Group, Inc. (CHG) with regard to the concerns outlined in your October 2, 2001, letter. A concern was expressed regarding CHG's Integrated Safety Management System (ISMS) in the areas of feedback and improvement as well as corrective action management. Based on the results from a September 2002 Focused Review of the CHG ISMS, we believe CHG is now implementing an acceptable ISMS. CHG, however, will need to continue the progress it has made to fully address several identified weaknesses.

On October 22, 2002, you were briefed by Office of River Protection and CHG management on both the strengths and weaknesses identified in the focused ISMS review report. I have enclosed a copy of the report for your information.

If you have any questions, please contact me at (202) 586-7709 or Ms. Sandra Johnson at (202) 586-0755.

Sincerely,

Jessie Hill Roberson
Assistant Secretary for
Environmental Management

Enclosure

cc w/o Enclosure:
Mark Whitaker, S-3.1
Paul Golan, EM-3
Sandra Johnson, EM-5
Mark Frei, EM-40
Roy Schepens, ORP

02.2426

OFFICE OF RIVER PROTECTION

FOCUSED REVIEW OF CH2M HILL (CHG) INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS)

FINAL REPORT
Volume I

September 2002

US Department of Energy
Washington D.C.

I, by signature here, acknowledge that I concur with the Team Leader in the findings and conclusions of this oversight report for the Office of River Protection ISMS in my assigned functional area.

J. J. Hynes
DOE-ORP

Stephen H. Pfaff
Operations/Training and Support

Terry E. Krietz
Operations/Training and Support

Chris Bosted
Management

David H. Brown
Hazards

Linda Quarles
Hazards

Tom Pestorius
Senior Advisor

APPROVED:

T. Zack Smith
Team Leader

Date 9/16/02

TABLE OF CONTENTS

VOLUME 1

Executive Summary i
1.0 INTRODUCTION 1
2.0 BACKGROUND 2
3.0 OBJECTIVES AND SPECIAL CONSIDERATIONS 3
4.0 LESSONS LEARNED 4
5.0 FUNCTIONAL AREA ASSESSMENTS 5
5.1 U. S. Department of Energy (DOE) 5
5.2 Hazards (HAZ) 5
5.3 Management (MG) 6
5.4 Operations (OP) 8

VOLUME II

Assessment Forms
Team Member Biographies
Appointment Letter
Review Plan and Criteria and Review Approach Document

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 the safety performance objective. To ensure these objectives are met, the Department issued DOE Policy (P) 450.4, *Safety Management System Policy*, and the DOE Acquisition Regulations (DEAR, 48 CFR 970).

This report documents the results of the review conducted to verify that: (1) the recent changes to the CH2M Hill Hanford Group (CHG) Integrated Safety Management System (ISMS) address deficiencies identified by the July 2001 EH-22 Focused Review and a DNFSB Staff Issue Report from September 4, 2001; (2) new and relevant corporate policy is implemented by Department Managers; (3) they have provided tailored direction to the facility management who implement it; and (4) that the Office of River Protection (ORP) of the Department of Energy has documented processes that integrate their safety activities and oversight with those of CHG. The general conduct of the review was consistent with the direction provided by the DOE Integrated Safety Management Systems (ISMS) Verification Team Leader's Handbook.

To conduct the review, the team was divided into four functional area review teams. The functional areas were: Management (MG); Operations (OPS); Hazard Identification (HAZ); and DOE. The reviews were conducted using Criteria and Review Approach Documents (CRAD) that were based on the Core Functions and Guiding Principles from the DOE Policy and associated guide. The CRAD were adjusted for this focused review to emphasize Feedback and Improvement and recent changes made to address the corrective actions taken to address the deficiencies identified in the July 2001 EH-22 Focused Review. Summaries of the reviews are contained in Appendix 6.0 with details in Volume II.

The CHG Organization at the Hanford Tank Farms has undergone significant change recently to address critical ISMS assessments completed by the DNFSB Staff, the DOE Office of Environment, Safety and Health Division and by CHG self-assessment reports. Organizational structure and personnel adjustments have been made, including some at senior management levels.

CONCLUSION

There is a positive safety culture in-place at the Hanford Tank Farms. The management team was found to be competent and highly aware of safety and safety integration issues. The policies, procedures and practices observed during the focused ISMS verification were found to be generally in agreement with requirements and effective in meeting goals. Improved processes and practices have been developed and are in the implementation stage. CHG managers recognize continued management attention will be needed to ensure these improved processes and procedures are effective. Effective performance indicators have been put in place to monitor the new programs.

CHG has made major improvements to their ISMS feedback and improvement processes. The most notable enhancement was the development of the Problem Evaluation Request (PER) Program, a web-based program that any CHG employee can use to provide feedback or concerns. While implementation of the PER Program is still progressing, it has already proved to be a valuable tool to track concerns and provide the trending data necessary to drive improvement.

The DOE HQ Office of Environment, Safety and Health completed an independent assessment of the CHG in July 2001. A comprehensive corrective action plan that addresses all areas of concern in this report is in place. Weekly progress meetings are held with DOE/ORP regarding the corrective action status of the items in the plan. The CAP is receiving appropriate management attention by both CHG and DOE/ORP Management.

The management systems provide a robust methodology for converting mission requirements into work packages with safety integrated.

Issues and Strengths noted during the ISMS focused assessment are summarized below. A more detailed discussion of these items is included in Volume II of this report.

Issues

DOE-1	A formal DOE Management walk through program does not exist.
DOE-2	An integrated ORP assessment schedule has been developed, but has not yet been effectively implemented.
HAZ-1	Better preparation prior to Enhanced Work Planning sessions could improve hazard analysis.
HAZ-2	Required radiological hold points are not always formally specified in work procedures.
HAZ-3	The current AB for the Tank Farms is excessively complex which increases the potential for inadequate USQ screens and reviews.
MG-1	The process for Integrated Priority Planning should be formalized by procedural requirements.
MG-2	USQ Evaluators are not required to complete training on the processes and systems they are preparing USQ screens and determinations on.
MG-3	The delinquency rate for corrective actions coming from the PER System is excessive.
MG-4	Configuration management and work control coordination between Projects and Operations needs improvement.
OP-1	Supervisors were inconsistent in whether or how they verified that personnel assigned to a task were trained and qualified to perform that task.
OP-2	Two identified safety hazards (noncompliance with standards) were not promptly abated nor were planned corrective actions tracked.
OP-3	The hazard analysis and control development processes used for work planning do not sufficiently identify the use of engineering controls and work practices and administrative controls as the preferred control methods before consideration of personal protective equipment.

OP-4 Work planners are not proficient in the use of the improved feedback and improvement tools designed to identify lessons learned that should be addressed in work instructions.

OP-5 Field work supervisors and planners are not yet effectively populating the new Post-Job Review and Lessons Learned web page with useful feedback information to facilitate improvements in subsequent work.

Strengths

DOE-S-1 Effective systems are in place to communicate issues through the DOE Management chain.

DOE-S-2 ORP Facility Representatives provide effective safety oversight of daily contractor operations.

DOE-S-3 Authorization Basis (AB) Engineers are performing effective AB reviews and follow up on day to day issues.

DOE-S-4 Establishment and operation of the Technical Working Group provides an effective forum for resolution of Authorization Basis issues.

HAZ-S-1 CHG has a comprehensive process for planning work that is defined in procedures. The new Hazards Review Module is improving the way hazard controls are specified in work instructions.

HAZ-S-2 Initiation of the Technical Working Group is an improvement in AB hazards analysis since the July 2001 - EH-22 Focused Review, and appears to be a good process in development of the DSA.

HAZ-S-3 Nuclear Safety & Licensing continues to issue monthly reports on the effectiveness of enhanced training for USQ evaluators, to improve the quality of USQ determinations and evaluate the need for further corrective actions.

MG-S-1 The work prioritization and control process appears to be mature, well understood, and integrated into normal CHG activities.

MG-S-2 Tailgate safety meetings are relevant and timely.

MG-S-3 The PER process provides a comprehensive method to document and track problems with the operation of the tank farms. Progress has been made in implementing the system.

MG-S-4 Management has shown the desire to find and fix problems. This willingness to correct errors is the basis for recent improvements.

MG-S-5 Improvements in the management assessment program have provided good returns in the USQ Process review and the Lessons Learned Program review.

MG-S-6 Senior personnel changes by CHG are having a positive influence on attention to detail and safety integration at the tank farms.

OP-S-1 Observed field work supervisors demonstrated strong leadership and control of the work activities, as well as exhibiting a comprehensive understanding of the safety and operational requirements.

OP-S-2 Operating and maintenance procedures clearly consider human factors in their style.

OP-S-3 Management oversight of tank farm work has improved structure, scheduling, results, and focus on a feedback process that enables the managers to improve their oversight abilities.

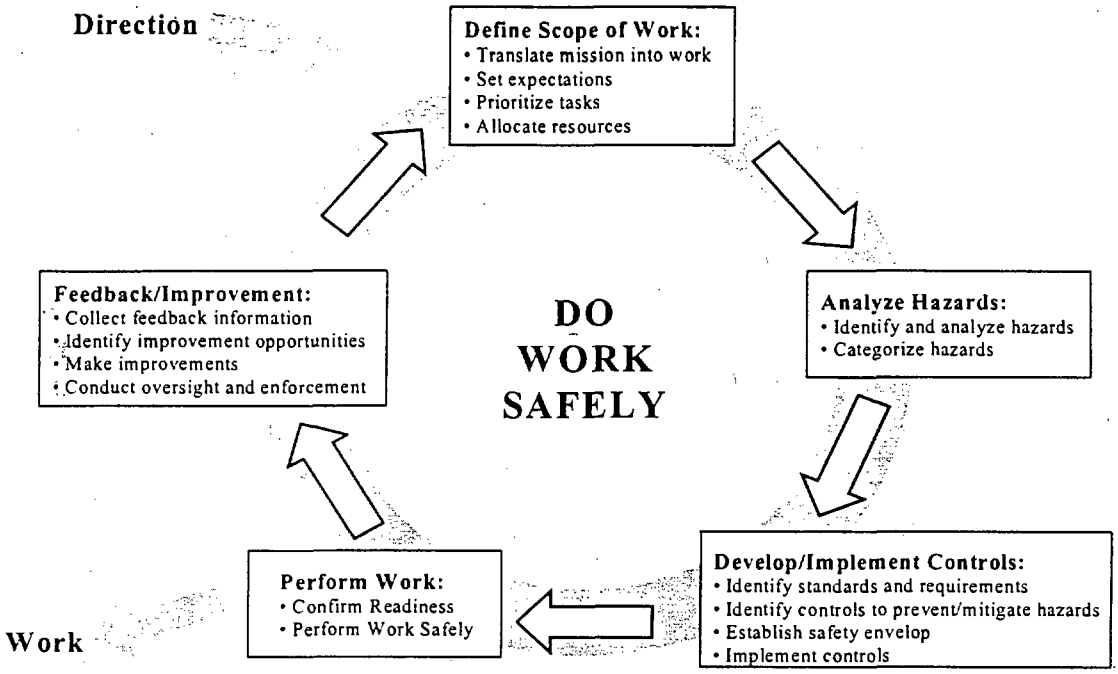
1.0 INTRODUCTION

A review of CH2MHILL Hanford Group, Inc. (CHG) Integrated Safety Management System (ISMS) implementation was performed by the U. S. Department of Energy (DOE) from September 9 through September 16, 2002.

The review involved a concentrated effort by a qualified and experienced team to evaluate CHG Integrated Safety Management (ISM) performance and DOE Office of River Protection (ORP) activities. This review was performed consistent with the requirements of DOE-HDBK-3027-99 for an ISMS verification. The review focused on the effectiveness of feedback and continuous improvement, effectiveness of corrective actions implemented in response to the July 2001 EH-22 Focused Review, and improvements in areas of noted concern in prior Defense Nuclear Facilities Safety Board (DNFSB) correspondence.

The review was based on the program and performance requirements for implementing the objectives, guiding principles, and core functions of Integrated Safety Management (ISM) as described in DOE Policy 450.4. The policy describes five core functions, which provide a structured approach to safely perform work with the rigor commensurate with hazards. These core functions are: define the scope of work; analyze the hazards; develop and implement hazards controls; perform work within controls; and provide feedback and continuous improvement (See Figure 1). The policy also identifies seven guiding principles that include: line management responsibility for safety; clear roles and responsibilities; balanced priorities; competence commensurate with responsibilities; identification of safety standards and requirements; hazards controls tailored to work being performed; and operations authorization.

Figure 1. Integrated Safety Management Core Functions



2.0 BACKGROUND

In accordance with Contract DE-AC27-99RL14047, CHG is responsible for the planning, management, and execution of Tank Farm projects, operations, and other activities. The Tank Farm Facility includes:

- 177 underground single shell (149) and double shell (28) tanks in the 200 East and West Hanford areas,
- Waste transfer systems,
- 204-AR Waste Unloading Facility,
- 244-AR Vault,
- 242-T and 242-S Evaporators,
- Grout Facility, and
- Other miscellaneous equipment items, inactive storage facilities, waste storage pads, etc. as described in the Final Safety Analysis Report (FSAR) (HNF-SD-WM-SAR-067).

Per Contract DE-AC27-99RL14047, CHG is obligated to integrate safety and environmental awareness into all activities, including those of subcontractors at all levels consistent with Integrated Safety Management principles.

CHG has a mature ISMS. Both Phase I (October 1998) and Phase II (August 1999) verifications have been performed and ORP recently approved revision 4 of the ISMS Description (RPP-MP-003). Facilities and activities are covered by approved authorization agreements that include a FSAR and technical safety requirements (TSR) documents. Additionally, the FSAR is undergoing an update to meet the requirements of 10CFR830.207 by the April 10, 2003 deadline. A timeline of major ISMS implementation milestones for the Tank Farm Contractor is provided below:

- October 1998, ISMS Phase I Verification
- May 1999, DOE-ORP Line Management Readiness Review
- August 1999, ISMS Phase II Verification
- June 2000, DOE-ORP declares ISM fully implemented at River Protection Project
- April to July 2001, DOE ES&H Oversight Focused Review (EH-22 assessment)
- October 2001, Defense Nuclear Facilities Safety Board (DNFSB) Letter summarizing concerns with CHG implementation of ISM
- April 2002, revision 1 of the corrective action plan developed in response to EH-22 assessment issued
- June 2002, revision 4 of CHG ISMS Description issued

3.0 OBJECTIVES AND SPECIAL CONSIDERATIONS

The objectives of this review were to:

- Perform a focused ISMS verification to determine the effectiveness of CHG's actions to correct deficiencies in their ISM implementation, with emphasis on Core Function 5 – Feedback and Continuous Improvement, and
- Evaluate the effectiveness of DOE ORP processes, mechanisms, and contractor oversight activities that ensure proper implementation of the CHG ISMS.

Due to the number of corrective actions CHG has implemented in response to prior assessments, a focused ISMS assessment was performed consistent with the guidance of DOE-HDBK-3027-99 for an ISMS verification. This final report provides the ORP and CHG with a measure of the effectiveness of corrective actions CHG has implemented to improve its ISM Program. Additionally, this report should (1) aid ORP in determining if ORP efforts are adequately focused on supporting effective implementation of ISM by CHG; and (2) provide ORP management with an understanding of CHG's ISMS posture and ability to do work safely.

Results of the review have been structured around the five Core Functions of ISMS in a manner similar to the EH-22 assessment performed in Spring 2001. Criteria and Review Approach Documents (CRADs) were prepared (Volume II of this report) using some of the same objectives and criteria as those established within DOE-HDBK-3027-99 for this ISMS verification. The review approach established within each CRAD was tailored to specific focus areas based on special considerations for the review and results of recent assessments (see below for details). The Review Plan and CRADs approved by the ORP Manager prior to commencement of this review.

Special Considerations for Review

- Requirements Basis: DOE directives, Department of Energy Acquisition Regulation clauses, and other applicable requirements are listed in and invoked through CHG Contract DE-AC27-99RL14047. How CHG implements these requirements is further defined by the Authorization Basis, Standards/Requirements Identification Documents, CHG ISMS Description for each core function (Revision 4), and CHG administrative implementing procedures. ORP is currently actively monitoring progress and assessing closure status.

- Effectiveness of the EH-22 Assessment Corrective Actions: Some corrective actions implemented in response to the July 2000 EH-22 Focused Review were recently closed. As such, it was too early to fully assess the effectiveness of their implementation. However, in such cases actions initiated prior to full corrective action completion were evaluated to ensure acceptable ISMS implementation in the interim.

- Defense Nuclear Facilities Safety Board (DNFSB) Concerns: In letter from J. T. Conway, DNFSB, to J. H. Roberson, DOE HQ, concerns were expressed regarding weaknesses in the CHG ISMS. The DNFSB expressed concerns with problems in the implementation of the CHG feedback and continuous improvement process and the magnitude of completed and planned modifications to the ISMS, indicating a focused verification review of the revised program may be warranted. These areas of concern were evaluated as part of this assessment.

Additional documents considered in the development of this assessment plan and the CRADs are listed in Volume II.

4.0 LESSONS LEARNED

1. In-briefs should include the mechanisms the facility uses to execute its ISMS, program corrective actions for past ISMS issues, and provide two or three examples that the facility feels demonstrates their successful integration of the safety requirements.

2. During ISMS reviews, the facility should identify and perform candidate evolutions or maintenance activities that stress the use of ISMS functions and principles. For example, a work planning process involving Operations, Engineering and the Projects Organizations.

3. Providing ISMS Review Team Members computer access to the contractor and DOE web pages and procedure and report(s) files on electronic media was very helpful and saved time.

4. Central location for the Review Team and conference room access and use contributed greatly to Review Team efficiency.

5.0 FUNCTIONAL AREA ASSESSMENTS

5.1 U. S. Department of Energy (DOE)

DOE Line Management is responsible for safety and is cognizant of day to day activities, issues, and issue resolution. Effective systems are in place to communicate issues through the DOE Management chain **(DOE-S-1)**. Although direct observation of field activities by DOE Management is an effective method of independently monitoring the level of contractor performance, a formal DOE Management walk through program does not exist **(DOE-1)**. Regularly scheduled walk throughs by DOE Management would provide a higher level perspective of routine operations and reinforce management's commitment of excellence to field personnel. Facility Representatives (FRs) for Tank Farm operations have a clear understanding of oversight responsibilities and provide effective safety oversight of daily contractor operations **(DOE-S-2)**. The level of oversight provided by the FRs is appropriate and effective; relevant issues are identified.

Authorization Basis (AB) Engineers are performing effective AB reviews and follow up on day to day issues **(DOE-S-3)**. AB Engineers provide in-depth reviews of applicable issues and adequately support the line organization. ORP, external reviews, and the contractor have identified USQ process issues during the past two years. The ORP AB team has provided extensive support and guidance to the contractor, which is positively influencing the safety of operations.

Issues are raised to the appropriate ORP Safety and Health personnel for resolution as necessary and site wide evaluation. They are generally engaged in day to day operations, however proactive evaluations of the contractor have not been institutionalized. An integrated ORP assessment schedule has been developed, but has not yet been effectively implemented **(DOE-2)**.

5.2 Hazards (HAZ)

CHG has a formalized process for identifying hazards and incorporating controls in work planning that is consistent with DOE ISMS requirements. Planners and safety professionals use a new automated process, the "Hazard Review Module" (HRM), to incorporate controls into work steps. This is a significant improvement over the older method that produced a stand-alone list of controls. The HRM addresses the full spectrum of hazards, including environmental, industrial safety, industrial hygiene, radiological control, and nuclear safety. Hazard controls are integrated into the work instruction. Additionally, steps in work instructions required to satisfy technical safety requirements are emphasized **(HAZ-S-1)**.

Work is classified according to risk. Above a reasonable threshold, the "Enhanced Work Planning" (EWP) process is applied. With this process, procedure writers,

operators, safety professionals, system engineers, and others meet to review procedures in detail, assuring that all necessary controls are included. However, better preparation on the part of participants may improve the effectiveness of EWP meetings **(HAZ-1)**.

Earlier this year, the Documented Safety Analysis (DSA) Technical Working Group (TWG) was established. Control decision meetings are conducted to support DSA TWG activities by utilizing the workers in the field to assure that all hazards are analyzed and engineering staff to ensure that needed controls are developed. Initiation of the TWG is an improvement in AB hazards analysis since the July 2001 EH-22 Focused Review, and appears to be a good process in development of the DSA **(HAZ-S-2)**.

The process for implementing AB changes, as explained by the Safety Analysis Acting Manager, is adequate. The USQ process is used to evaluate whether an AB change is necessary. The Plant Review Committee is another level of defense used to resolve potential USQ issues and other matters associated with safe operations of the tank farm facilities. An AB implementation checklist is utilized along with associated verifications of actions to ensure that AB changes are incorporated into working documents.

Implementation of the USQ process was identified as a problem in the July 2001 EH-22 Focused Review. Management attention was appropriately placed on this area of concern to include supplemental training and more rigorous monitoring of the USQ program. A Nuclear Safety and Licensing (NS&L) self-assessment process evaluates a sampling of screenings and determinations each month. Trending has indicated that improvement has occurred. ORP personnel with responsibility for AB oversight concur with the self-assessment results **(HAZ-S-3)**.

The procedure for conducting USQ evaluations for the Tank Farm requires screeners and evaluators to go through nine pages of listed safety basis documents and amendments to perform a USQD. This is an excessively complex task. Improving the quality of AB amendments and incorporating these amendments into the main AB documents would reduce these references. In turn, this would provide more clarity in the USQ determinations **(HAZ-3)**.

5.3 Management (MG)

CHG has a work prioritization and control process that appears to be mature, well understood, and integrated into normal CHG activities **(MG-S-1)**. Management has shown the desire to find and fix problems, which has led to recent improvements **(MG-S-4)**. Senior personnel changes by CHG are having a positive influence on attention to detail and safety integration at the tank farms **(MG-S-6)**. An event during the assessment period demonstrated that configuration management and work control coordination between Projects and Operations needs improvement **(MG-4)**.

CHG work is prioritized using good practices. Hierarchy of work activities is based on hazard to public, worker and environment. Major work activities and projects have been categorized into hierarchy groups such as Mission Minimum Safety, Regulatory Compliance, Mission Support and Operational Enhancements. Special project priorities are established to meet milestones in the Tri-Party Agreement or in DOE-provided Performance Incentives. The 12-Week Rolling Schedule and Tank Farm Contractor Work Control procedures establish the roles and responsibilities for performance of Tank Farm mission-related tasks. It was noted that the process for Integrated Priority Planning should be formalized by procedural requirements **(MG-1)**.

CHG has a training and qualification program for the disciplines that identify hazards and specify controls. The qualification processes described in the qualification cards were coherent, combining education, classroom training, and practical experience. USQ process training is satisfactory; however, USQ evaluators are not required to complete training on the specific processes and systems they are preparing USQ screens and determinations on **(MG-2)**.

There has been much improvement in the area of feedback and improvement. The Problem Evaluation Request (PER) Program provides a comprehensive method to document and track problems and other feedback from operation of the tank farms **(MG-S-3)**. The PER process directly addresses the lack of feedback and improvement in the CHG ISMS noted by recent evaluators. Progress has been made in implementing the PER Program, but delinquency rate for corrective actions coming from the PER Program is currently excessive **(MG-3)**. Improvements in the management assessment program have provided good returns in the USQ Process review and the Lessons Learned Program review **(MG-S-5)**. The Lessons Learned program is robust and used to transfer information to the company so that the most important lessons receive the highest level of attention. A process is in place for differentiating between the applicability of lessons learned. The Lessons Learned manager and coordinator ensure that lessons learned are distributed to the appropriate work groups. The Tailgate safety meetings, conducted by CHG, provide relevant and timely feedback between workers and management **(MG-S-2)**.

Five safety events, which were determined by CHG to be the five most significant events during the past six months, were reviewed with the Vice President of Operations to assess management actions taken to evaluate, resolve and prevent recurrence. Each of the events was thoroughly investigated and adequate actions were taken to evaluate, resolve and prevent recurrence.

The DOE HQ Office of Environment, Safety and Health (EH-22) completed a Focused Review of the CHG in July 2001. CHG prepared a comprehensive Corrective Action Plan for the EH-22 report was prepared and approved by the Assistant Secretary for Environmental Management (EM-1) and was found to comprehensively address all areas of concern.

5.4 Operations (OP)

CHG has established and implemented an integrated process to effectively plan, authorize and execute safe work in the Tank Farms. Work planners displayed a high level of knowledge and frequently consulted safety professionals matrixed to their specific projects. Operators, technicians, craft personnel, and safety professionals participated in Enhanced Work Planning sessions for higher risk jobs. Shift managers thoroughly reviewed all work packages for the upcoming day, and carefully controlled the work authorization to maintain safe work conditions and compliance with the Tank Farms safety basis. Field work supervisors demonstrated capable leadership and control of the tank farm work, as supervisors and workers alike carefully followed work instructions **(OP-S-1)**. Procedures have improved as writers give human factors increased consideration during development **(OP-S-2)**.

Over the past year, CHG has implemented a variety of methods to enhance communication of issues and lessons learned and has worked to improve what was already in place. Weekly tailgate meetings follow a consistent format of reviewing occurrence reports, injuries, safety topics and integrated safety management training. Workers interacted freely in observed weekly safety meetings. New performance indicators such as the Event-Free Clock are discussed daily. Shift turnover briefings are more formal. Management oversight of tank farm work has more structure, better scheduling, useful results, appropriate upper management emphasis, and a feedback process that enables the managers to improve their oversight abilities **(OP-S-3)**.

CHG has also developed some new tools to enhance the planners' ability to use lessons learned and post-job review comments, but more work remains to improve their ability to use these tools **(OP-4)**. Field work supervisors and planners are not yet effectively populating these new computer feedback tools with useful information **(OP-5)**. The new Hazard Review Module shows promise as a simpler method to incorporate worker safety information, safety basis controls, and necessary training into the work instructions. The hazard analysis and control development processes in general however, do not sufficiently identify the use of engineering controls and work practice/administrative controls as the preferred control methods before consideration of personal protective equipment **(OP-3)**. During observation of work activities, supervisors inconsistently verified that the assigned workers were properly trained for their tasks **(OP-1)**.

OFFICE OF RIVER PROTECTION

FOCUSED REVIEW OF CH2M HILL (CHG) INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS)

FINAL REPORT
Volume II

September 2002

US Department of Energy
Washington D.C.

Assessment Forms

Functional Area:	Objectives DOE.1, DOE.2
DOE	Date: 09/16/02

Objectives:

DOE.1 ORP procedures and mechanisms should ensure that work is formally and appropriately authorized and performed safely. ORP line management should be involved in the review of safety issues and concerns and should have an active role in authorizing and approving work and operations. (Appendix 3, DOE.1, DOE-HDBK-3027-99)

DOE.2 ORP procedures and mechanisms ensure that hazards are analyzed, controls are developed, and that feedback and improvement programs are in place and effective. DOE line managers are using these processes effectively, consistent with FRAM (ORP 411.1-1, R1) requirements. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

The Criteria and Approach used in this assessment of this functional area are provided in the Criteria, Review and Approach Document (CRADs). See Volume II of this report (Attachment A of the Review Plan).

Records Reviewed

- Safety Management Functions, Responsibilities, and Authorities Manual For The U.S. Department of Energy, Office Of River Protection, ORP M 411.1-1
- ORP Lessons Learned Program, ORP M 232.2
- ORP Integrated Assessment Program, ORP M 220.1
- AMSQ Safety/Authorization Basis Document Review and Approval, ORP PD 5480.23-1
- Consolidated Action Reporting System (CARS), ORP M 412.1
- Startup and Restart of Tank Farm Contractor Nuclear Facilities, ORP M 425.1
- ORP Fire Protection Program, ORP M 420.1-1
- Unreviewed Safety Question Process, TFC-ENG-SB-C-03
- Facility Representative Daily Reports
- Facility Representative Review of CHG Work for the Week of September 1 to September 6, 2002
- Tank Farm Occurrence Reports
- Lessons Learned Bulletins IB-02-18, IB-02-24, SN-02-06, GP-02-01
- HQ memorandum from J.H. Roberson to R.J. Schepens, "Request for Plan of Action to Assure Timely Unusual Occurrence Report Approvals," dated July 8, 2002
- ORP memorandum from R.J. Schepens to J.H. Roberson, "Timely Unusual Occurrence Report Approvals," dated August 1, 2002
- Letter from R.J. Schepens to E.S. Aromi, "Occurrence Report Timeliness, Discovery Times, and Quality," dated July 8, 2002
- Letter from E.S. Aromi to R.J. Schepens, "Occurrence Report Timeliness, Discovery Times, and Quality Response," dated August 9, 2002

- Memorandum of Agreement (MOA) Between the U.S. Department of Energy (DOE), Richland Operations Office (RL) and the DOE, Office of River Protection (ORP) for Health and Safety Support, dated August 6, 2001
- Memorandum of Agreement Between the U.S. Department of Energy, Richland Operations Office and the U.S. Department of Energy, Office of River Protection for Fire Protection Support, dated August 29, 2002
- Final Report – Contractor ORR for Receipt and Staging of Additional High-Level Waste Into Tank 241-SY-101, dated August 30, 2001
- ORP ORR Final Report for Authorizing the Transfer and Staging of Waste Back into Waste Tank 241-SY-101, dated September 20, 2001
- Safety Basis Implementation Checklist for the Tank Bump Amendment, dated July 31, 2002
- Letter from R.J. Schepens to E.S. Aromi, "Progress Review of CH2M Hill Hanford Group, Inc. (CHG) Unreviewed Safety Question (USQ) Process Improvement Activities Following the Special Report Order (SRO) of October 22, 2001, dated September 10, 2002
- CHG Subcontract to Oceaneering International, Inc., Contract Number 00011426, "Double-Shell Tank Annulus Remote Wall Cleaning System, dated August 2, 2001

Interviews Conducted

- ORP Facility Representatives, Tank Farms
- CHG Facility Director, Single Shell Tank Facilities
- CHG Project Manager, Interim Stabilization
- CHG D Shift Director, Central Command and Control
- CHG Chief Engineer
- ORP Assistant Manager for Operations (acting)
- ORP Director, Operations and Safety Oversight
- ORP Assistant Manager for Environment, Safety, Health & Quality (acting)
- ORP Director, Safety and Health Division (acting)
- ORP Director, Quality Assurance Office
- ORP Director, Operations and Maintenance Division
- ORP Director, Technical Operations Division
- ORP Authorization Basis Engineers
- RL Fire Protection Engineer
- RL Director, Safety and Health

Observations

- 200 West Tank Farm Plan of the Day
- Morning Facility Representative Operations Conference Call
- Facility Representative Daily Routines, 200 West Tank Farm
- Bi-weekly FR/CHG interface meeting
- Assistant Manager for Operations Direct Reports Daily Meeting
- Manager, ORP Daily Staff Meeting
- ORP Corporate Board meeting
- ORP/CHG Technical Working Group Meeting

Discussion of Results

DOE Management

DOE Line Management is responsible for safety and is cognizant of day to day activities, issues, and issue resolution. Effective systems are in place to communicate issues through the DOE Management chain **(DOE-S-1)**. A daily Facility Representative (FR) conference call is conducted to communicate operational status, issues, and occurrences to the Director, Operations and Safety Oversight Division. The conference call also provides a good forum for sharing information among FRs located throughout the Tank Farms. Subsequently, the Assistant Manager for Operations meets with direct reports, including Operations, Engineering, and Programs; this information is then conveyed to the Manager, ORP in a daily morning meeting. Day to day operations are recorded in a Daily Operations Report which is disseminated to an appropriate audience. Observation of this process revealed that it is an effective and efficient tool for management. Additionally, FRs provide timely notifications of tank farm reportable occurrences to the ORP Management chain, including nights and weekends. Although direct observation of field activities by DOE Management is an effective method of independently monitoring the level of contractor performance, a formal DOE Management walk through program does not exist **(DOE-1)**. Regularly scheduled walk throughs by DOE Management would provide a higher level perspective of routine operations and reinforce management's commitment of excellence to field personnel.

Facility Representatives

FRs for Tank Farm operations have a clear understanding of oversight responsibilities and provide effective safety oversight of daily contractor operations **(DOE-S-2)**. Observation of daily FR activities such as Plan of the Day attendance and field walkdowns revealed that FRs are engaged in day to day operations, knowledgeable of Tank Farm facilities, and properly prioritize issues; daily activities are based on pertinent issues and high risk work. The level of oversight provided by the FRs is appropriate and effective; relevant issues are identified. For example, FRs identified (a) the contractor failed to effectively implement a Technical Safety Requirement program to manage waste tank dome loading, (b) examples of inadequate performance of the USQ process by the contractor, and (c) failure of the contractor to respond to a failed functional test of tank ventilation equipment relied on to meet a Limiting Condition of Operation. As necessary, FRs communicate with Authorization Basis Engineers and Environment, Safety, and Health support personnel for follow up on identified issues. FRs have a good rapport with contractor facility management from Field Work Supervisors to Facility Director. Bi-weekly FR/CHG interface meetings are held to discuss current issues and provide the status of on-going issues. Observation of the interface meeting revealed it to be a worthwhile forum to openly discuss issues as well as recent attributes of tank farm activities. A monthly report is compiled with issues discussed at the bi-weekly meetings. FR issues are appropriately addressed by contractor management and are improving the safety of operations. The reports have been consistently issued in a timely fashion.

Occurrence Reports

ORP Line Management is actively engaged in oversight of the contractor's effort to eliminate the backlog of occurrence reports that have remained open for extended periods of time without contractor Facility Manager approval. At ORP's direction, CHG has issued a Corrective Action Plan, which properly prioritizes completion of outstanding Unusual Occurrences and Off-Normal Occurrences. The backlog of 108 reports in July is notably decreasing; at the time of this review, 28 occurrence reports had been submitted and approved. Significant input has been provided to CHG by the FRs to improve the quality of the reports being submitted. Recent occurrence reports approved by ORP FRs were evaluated and found to properly evaluate the event, identify the root cause, and contain appropriate corrective actions to prevent recurrence.

Lessons Learned

Lessons learned such as contractor Safety Notices, Good Work Practices, and Information Bulletins are effectively communicated to line personnel; program requirements are contained in ORP Lessons Learned Program, ORP M 232.2. Timely notification of lessons learned information is made to the FRs by the Director, Operations and Safety Oversight Division. Lessons learned are readily available to personnel via the Hanford Intranet.

Readiness Reviews

A review of contractor and ORP Operational Readiness Review reports for the transfer and staging of waste back into Waste Tank 241-SY-101 completed in September 2001 revealed that a sound startup assessment program exists. A comprehensive assessment evaluating the readiness to start operations was conducted; pertinent issues were identified during the ORP review.

DEAR Clause Flowdown

A contract between CHG and Oceaneering International, Inc. was reviewed to confirm DEAR Clause flowdowns were in place for subcontractor work. Flowdown of applicable safety requirements were verified to be in Contract 00011426 for use of a remote wall cleaning system (high pressure sprayer) for double shell tanks. Applicable regulations were included such as 29CFR1910 OSHA Standard, 29CFR1926 Construction Standards, DOE Order 440.1, and Worker Protection Management for DOE Federal Contractor Employees. Also, the requirement for all work to be evaluated using the Automated Job Hazard Analysis tool prior to performing work was communicated.

Authorization Basis Oversight

Authorization Basis (AB) Engineers are performing effective AB reviews and follow up on day to day issues **(DOE-S-3)**. AB Engineers provide in-depth reviews of applicable issues and adequately support the line organization. AMSQ Safety/Authorization Basis Document Review and Approval, ORP PD 5480.23-1, clearly delineates a formal review process for AB submittals, comment resolution, and supporting documentation. Appropriate criteria have been established regarding the need for ORP reviews and approvals of AB documents. ORP, external reviews,

and the contractor have identified USQ process issues during the past two years. The ORP AB team has provided extensive support and guidance to the contractor, which is positively influencing the safety of operations. ORP AB Engineers and FRs have received USQ training based on the new nuclear safety rule requirements; interviews with personnel confirm that personnel are knowledgeable. ORP reviews of a sample of USQD's were performed between December 2001 and February 2002 and revealed that significant deficiencies existed. More recently, ORP cited a continuing issue of USQD errors in the Safety Evaluation Report for the Annual AB Update. ORP recently approved the contractor USQ process procedure which complies with 10CFR 830.203, "Unreviewed Safety Basis Question Process." AB Engineers provided significant procedure input, primarily focusing on processes to avoid hampering the contractor's ability to manage the USQ process. Recently a team of ORP and contractor AB personnel was formed as the Technical Working Group (TWG). The group's charge was primarily to ensure timely issuance of the 10CFR830 compliant Documented Safety Analysis. Observation of a TWG meeting revealed issues are openly discussed among members. Establishment and operation of the Technical Working Group provides an effective forum for resolution of Authorization Basis issues **(DOE-S-4)**. An integrated approach is utilized to review and approve AB changes; FRs from the applicable facility as well as an FR with AB expertise are part of the AB review team. Pertinent issues are regularly presented by the team and communicated to the contractor in Safety Evaluation Reports for resolution. The AB review team completes field verification of AB implementation within 60 days of change implementation.

Safety and Health Support

Issues are raised to the appropriate ORP Safety and Health personnel as necessary for resolution and site wide evaluation. They are generally engaged in day to day operations, however proactive evaluations of the contractor have not been institutionalized. An integrated ORP assessment schedule has been developed, but has not yet been effectively implemented **(DOE-2)**. A Memorandum of Agreement (MOA) for sharing ESH services with DOE-RL was issued in August 2001; execution of the MOA has not been effective. Since issuance of the MOA, there were no occasions within the last year that integrated Fire Protection Engineering support for routine assessments at ORP. ORP utilized subcontractor support for fire protection oversight assistance two times during the past year, however assessment reports were never sent to the contractor due to concerns of quality of the reports. ORP has also utilized DOE-HQ in efforts to review the Tank Farm Fire Hazards Analysis. A recent reorganization at DOE-RL has allotted a pool of support resources for ORP. Advancements in the utilization of the resources is expected; a task order requesting specific technical support services was issued on September 12, 2002 which scheduled assessments of the respiratory equipment program, chemical management/hazard communication program, energized electrical equipment work permit system, and the lockout/tagout program. A new MOA was issued in August 2002 between ORP and DOE-RL specifically for Fire Protection Engineering support with assessments scheduled quarterly at the Tank Farms. Scheduling the assessments in advance will aid in gaining the support services requested.

July 2001 EH-22 Focused Review ORP Corrective Actions

The ORP Safety and Health Division provides oversight of CHG and ORP corrective actions in response to the July 2001 EH-22 Focused Review. Weekly interface meetings between ORP and CHG effectively track progress of the corrective action plan. ORP developed five corrective actions in response to the safety issue cited by the EH review. The issue stated "ORP line management has not established and implemented management systems that ensure effective oversight of contractor safety programs and performance as required by DOE Policy 450.5, Line Environment, Safety, and Health Oversight." Corrective actions included (a) developing and implementing organization/individual responsibility for performing contractor oversight and establishing an assessment program prioritized to the ORP mission and available resources, (b) developing and implementing a performance measure tracking, trending, and evaluation system for contractor oversight and ORP management assessment to ensure measurement of effective corrective action implementation, (c) consolidating the commitment tracking systems within ORP, (d) developing and implementing a self assessment program, and (e) developing a revised procedure consistent with 10CFR830, Nuclear Safety Management, for safety basis review and approval. The corrective action plan is comprehensive. All deliverables specified in the plan are designated as complete with the exception of an action to implement a performance measure tracking, trending, and evaluation program; ORP Quality Trending, ORP M 210.3 has been issued and a draft of the first trend report has been developed. Validations to verify effectiveness of the corrective actions in the plan are scheduled by ORP through the second quarter of FY 2003. ORP M 220.1, "ORP Integrated Assessment Program" adequately describes the conduct of assessments and ORP personnel have completed initial training on the conduct of assessments. A resource loaded ORP Integrated Assessment Schedule has been issued and contains an adequate array of assessment topics, including ES&H and Quality. A review of the schedule revealed that the majority of assessments recently scheduled have not been completed or they have been rescheduled. A comprehensive commitment tracking system was initiated in August 2001 to address the July 2001 EH-22 Focused Review and is described in ORP M 412.1, "Consolidated Action Reporting System (CARS)". All ORP organizations have been trained in the use of the web based system; issues and commitments are actively being tracked using the system.

Conclusion

The objectives have been met. ORP procedures and mechanisms ensure that work is formally and appropriately authorized and performed safely. ORP line management is involved in the review of safety issues and concerns and has an active role in authorizing and approving work and operations. ORP procedures and mechanisms ensure that hazards are analyzed, controls are developed, and that feedback and improvement programs are in place and effective. DOE line managers are using these processes effectively.

Issues

DOE-1 A formal DOE Management walk through program does not exist.

DOE-2 An integrated ORP assessment schedule has been developed, but has not yet been effectively implemented.

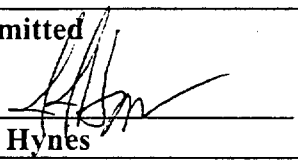
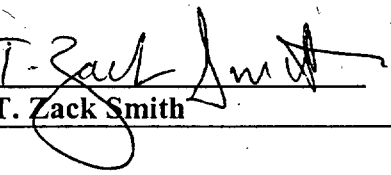
Strengths

DOE-S-1 Effective systems are in place to communicate issues through the DOE Management chain.

DOE-S-2 ORP Facility Representatives provide effective safety oversight of daily contractor operations.

DOE-S-3 Authorization Basis (AB) Engineers are performing effective AB reviews and follow up on day to day issues.

DOE-S-4 Establishment and operation of the Technical Working Group provides an effective forum for resolution of Authorization Basis issues.

Submitted  **J. J. Hynes**	**Team Leader**  **T. Zack Smith**

Functional Area: HAZARDS	Objectives HAZ.1, HAZ.2 Date: 09/16/02

Objectives:

HAZ.1 The full spectrum of hazards associated with the Scope of Work is identified, analyzed, and categorized. Those individuals responsible for the analysis of the environmental, health and safety, and worker protection hazards are integrated with personnel assigned to analyze the processes. (Appendix 3, HAZ.1, DOE-HDBK-3027-99)

HAZ.2 An integrated process has been established and is utilized to develop controls that mitigate the identified hazards present within a facility or activity. The set of controls ensure adequate protection of the public, worker, and the environment and are established as agreed upon by DOE. These mechanisms demonstrate integration, which merge together at the workplace. (Appendix 3, HAZ.2, DOE-HDBK-3027-99)

The Criteria and Approach used in this assessment of this functional area are provided in the Criteria, Review and Approach Document (CRADs). See Volume II of this report (Attachment A of the Review Plan).

Records Reviewed

- Implementation of DOE-ORP: 02-SHD-009, Direction to Proceed with Caustic Addition in Tank 241-AN-107, February 2002, 7T900-02-CEH-003
- Safety Basis Implementation Checklist for DOE ORP Approval of Analysis Errors, June 2002, 7T900-02-CEH-016
- Safety Basis Implementation Checklist for the High Efficiency Particulate Air Filter Administrative Control 5.18, HEPA Filter Controls Exemption at the 244-AR Facility, July 2002, 7T900-02-CEH-017
- Report of Effectiveness of Enhanced Training for USQ Evaluators for the Period May 2002, 7B300-CBE-2002-043
- Unreviewed Safety Questions, HNF-IP-0842, Volume 4, Section 5.4, Rev 13p
- Tank Farm Contractor Work Control, TFC-OPS-MAINT-C-01, Rev A-1
- Job Hazard Analysis, TFC-ESHQ-S_SAF-C-02, Rev A
- Operate 244-AR Instrument Air System, TO-280-100, draft
- RSTA, Replace Barrel Heating Element, ES-01-328/M
- 241-S-107 Saltwell Pump Installation, WS-01-00504/M
- 241-AY-102 Replace Wire, Drum and Displacer, 2E-01-01684/W
- Remove Breaker A-241-EDS-BKR-106 from Cubicle C-1, 2E-02-1130/M
- 241-AY Replace AY-101 Annulus CAM Vacuum Pump, 2E-01-00888/W
- 244-AR Building Service Station Switchgear, 2E-02-00621
- 244-A Replace Air Inlet Rotometers, 2E-00-02174/W
- Production Control Planner Qual Card and Guide, Qual Guide 350019
- ECN-655582

- ECN-655583
- ECN-66167
- ECN-664645
- Op Test CAM, USQ-TF-02-1068, Rev 0
- Occurrence Report on Missed Action, USQ-TF-O2-1062, Rev 0
- Operability of CAMs, USQ-TF-02-0712, Rev 0
- HEPA Filter Differential Pressure Interlock Systems -- Procedure Revisions And New Procedures For Their Operation, Testing, And Maintenance (244-CR VAULT), USQ-TF-99-0555, Rev 1
- ECN 659087, To Modify 241-C-104 Heel Pit Cover, USQ-TF-01-0623, Rev 0
- Review of ECN-661667, 241-SY-271 Cabinet Removal & CASS To TMACS Alarm Transfer, USQ-TF-02-0202, Rev 0
- (Approved) Categorical Exclusion For Labeling Activities And Changes To Non-Authorization Basis Documents To Update System, Structure Or Component (SSC) Identification Information, USQ-TF-96-1160, Rev 3
- USQ-TF-02-1101, Rev 0 for Forms Control, HNF-IP-0842, Vol 1, Section 2.14
- PER-2002-3234
- PER-2002-4850
- Conduct of Qualification Cards and Guides, TFC-BSM-TQ_IMP_C-02
- ALARA Work Planning, TFC-ESHQ-RP_RWP-C-03
- Tank Farm Contractor Work Control, HNF-IP-0842, Vol 5, Sect. 7.1
- Technical Procedure Control and Use, HNF-IP-0731
- Technical Procedure Format & Preparation Standard, HNF-IP-0842, Vol 1, Section 2.11
- Occurrence Report, RP--CHG-TANKFARM-2002-0057
- USQ Training and Qualification List
- Appointment of TFC Plant Review Committee Membership
- Tank Farm Contractor Plant Review Committee Meeting Minutes, July 11, 2002
- Safety Evaluation Report for the Calendar Year 2001 Annual Update of Tank Farms Final SAR and the Fiscal Year 2001 Annual USQ Report, July 2002, draft

Interviews Conducted

- Tank Farms System Engineering Director
- Characterization Planning Manager
- USQ Trainer
- Field Operations & Project Support Safety Manager
- Interim Stabilization Planning Manager
- Safety & Health Director
- Radiological Control Area Manager
- Radiological Engineering Manager
- DST Instrument Supervisor
- Planners (2)
- Nuclear Chemical Operator (2)
- Maintenance Pipefitter
- Maintenance Electrician
- Nuclear Safety Services Manager
- USQ Screener, NS&L

- USQ Evaluator, NS&L
- USQ Core Evaluator, NS&L
- System Engineer & USQ Core Evaluator
- Safety Analysis Acting Manager
- Nuclear Safety & Licensing Director
- Plant Review Committee Member
- Procedures Manager
- Interim Stabilization System Engineer
- Engineering Support Health Physicist
- Certified Safety Professional (specializing in electrical safety)

Observations

- Flammable Gas Data Review Group Meeting on SY-103 Gas Release Event
- Documented Safety Analysis Technical Working Group Meeting
- Plant Review Committee Meeting on SY-103 Gas Release Event
- Control Decision Meeting on Flammable Gas Hazards
- Enhanced work planning session for procedure, Operate 244-AR Instrument Air System, TO-280-100
- Talk-through of USQ screening and USQ determination for procedure Op Test CAM, TF-02-1062
- Talk-through of USQ screening and USQ determination for Occurrence Report on Missed Action TF-02-0712
- Talk-through of USQ screening and USQ determination for procedure Operability of CAMs, TF-02-1068
- Talk-through of planning process for work package, Remove Breaker A – 241-EDS-BKR-106 from Cubicle C-1, 2E-02-1130/M
- Talk-through of work package development Replace Liquid Observation Well at Riser 5 (TX Farm)

Discussion of Results

Hazard Controls

CHG specifies work activities in "routine work requests" (RWR) and "work packages" (WP). RWRs are intended for simple tasks and are limited to a simple statement of the work, while work packages specify requirements and provide procedures for more complicated tasks. CHG procedure "Tank Farm Contractor Work Control," TFC-OPS-MAINT-C-01, provides criteria for determining when a WP is required and when an RWR may be used. CHG uses a system of risk ranking to determine the level of control that will be applied to planning and execution of the work. Safety professionals evaluate the work and aid in a process for specifying controls. This is consistent with DOE's requirements for ISMS programs.

Until recently, CHG specified hazard controls in computer-generated documents using the "Automated Job Hazard Analysis" (AJHA) system. The AJHA produced a separate document

that was included in work packages or with RWRs. In the weeks preceding the assessment, CHG deployed a new system called the "Hazards Review Module" (HRM). The HRM is a significant improvement over the AJHA because it incorporates hazard controls directly into work instruction steps **(HAZ-S-1)**. Using the HRM, different safety professionals and work planners can develop hazard controls jointly over the computer network. At the time of the assessment, CHG was preparing a new release of the HRM. Personnel who used the HRM agreed that it was an improvement over the AJHA, but said there were some technical problems with the program. The new release was expected to correct these problems.

The assessment team observed the development of several work packages using the CHG Job Control System (JCS) and the HRM. This included observation of one "Enhanced Work Planning" (EWP) session. The JCS, HRM, and EWP provided a coherent means for personnel participating in the process to identify hazards and specify controls. Job planners, safety professionals, operators, procedure writers, and other disciplines participated in the EWP session. During the EWP, participants were given a chance to examine a proposed procedure in detail to assure that all necessary hazards were identified and controls were specified. As a whole, personnel did not come adequately prepared to conduct the session. Although a couple people had seen the new instrument air system and knew where it was located, they did not examine it enough to do an adequate job hazards analysis. Several people stated they had not seen the new system. One action item from the meeting was to check out the dehydrator and see how it works. Better preparation prior to EWP sessions could improve hazard analysis efficiency **(HAZ-1)**.

Procedures are subject to USQ screening and USQ evaluations to assure that they are consistent with the authorization basis. The HRM also includes an item to ensure that TSR controls are properly addressed in the work instructions. The July 2001 EH-22 Focused Review identified significant quality problems with the USQ process. Improvements have been made, but suggestions for further improvement are contained in the Management (MG) section of this report.

Hold Points

Work instructions are required to include radiological hold points based on criteria specified in TFC-ESHQ-RP-RWP-C-03, "ALARA Work Planning." There are also icons that identify steps necessary for compliance with TSR and AC requirements. These are hazard control features of the CHG ISMS program. However, work planners were not always placing the required hold points in work instructions.

For example, work instructions for WP WS-01-504/M, "S-107 Pump Install" did not have required hold points for radiological verifications. At Step 8.11.2, a health physics technician was required to verify contamination levels after opening a pump pit. Contrary to the requirements of the "ALARA Work Planning" procedure, no hold point was specified for this verification. While there is no reason to believe that the required survey was missed, the lack of required formal hold points was typical of other procedures reviewed by the assessment team **(HAZ-2)**.

Hazard Control Hierarchy

CHG procedures specify that hazard controls be specified in the hierarchy required by regulations and DOE orders. However, implementation of the hierarchy was weak in that personal protective equipment was specified without adequate consideration of engineering controls in some cases. This issue is addressed in the Operations (OP) section of this report.

Training

During the assessment, the assessment team found weaknesses in the training and qualification processes for personnel involved in USQ evaluations. Training of personnel is addressed in the Management (MG) section of this report.

AB/TSR Implementation

A Documented Safety Analysis (DSA) Technical Working Group (TWG) meeting was attended to assess the interaction of ORP and CHG in analyzing hazards and developing controls, and observe the progress in DSA development. The DSA TWG was established earlier this year, as an enhancement to the ORP and CHG Nuclear Safety Working Group, to provide focused management in developing DSA documentation guidance and a resource loaded Critical Path Method schedule for a safety basis amendment. The Tank Farms DSA shall be compliant with 10 CFR 830 while addressing the Secretary of Energy's announcement for accelerated cleanup. At the TWG meeting, the proposed plan for acceleration of DSA review, approval and implementation was presented. There was appropriate representation at the meeting, including members of CHG, ORP, and Nuclear Safety & Licensing (NS&L). The schedule appeared to be reasonable and members were actively engaged in discussing hazards and developing controls.

Control decision meetings are conducted to support DSA TWG activities by assuring that all hazards are analyzed and controls are developed for the new risk bins associated with 10 CFR 830. A control decision meeting on Flammable Gas Hazards was observed. Once again, appropriate representation and discussion existed to support the DSA development. Field workers discussed current hazards as an input to the process. As a result of the meeting, action items were assigned to review supporting engineering calculations, and conduct a hazards operability to better understand field activities, analyze hazards associated with those field activities, and ensure the appropriate controls are developed for implementation. Initiation of the TWG is an improvement in Authorization Basis (AB) hazards analysis since the July 2001 EH-22 Focused Review, and appears to be a good process in development of the DSA **(HAZ-S-2)**.

There was a Flammable Gas Data Review Group Meeting held to discuss the specifics of the SY-103 Gas Release Event. Gas release events have been observed in six Double-Shell Tanks, one of which has been remediated. Flammable gas deflagrations are an analyzed hazard in the Final SAR and TSR controls are established. The Flammable Gas Data Review Group is chartered to evaluate the tank behavior prior to all dome intrusive, waste intrusive, and waste disturbing activities on the five remaining tanks. The activities of this group were designed to serve as a defense-in-depth measure to the ventilation, monitoring, and ignition source controls placed in the tank farms AB for the management of the flammable gas hazard. The group developed

action items to verify operability of the monitoring equipment. Later, review of the gas release event was presented to the Plant Review Committee (PRC). The PRC identifies and resolves potential unreviewed safety question (USQ) issues and other matters for safe operation of the tank farm facilities. In the PRC meeting, further actions were assigned through use of the Problem Evaluation Request (PER) system. The PRC provides another level of defense in safe operation of the tank farm facilities.

The process for implementing AB changes, as explained by the Safety Analysis Acting Manager, is adequate. An AB implementation checklist is created, consisting of pre-implementation and post-implementation actions. The responsible managers sign the checklist for the pre-implementation items, and then the items are verified with signatures shown. Post-implementation items are tracked by the PER process. This checklist and associated verifications ensure that AB changes should be incorporated into working documents.

USQ Process

Implementation of the USQ process was identified as a problem in the July 2001 EH-22 Focused Report. Enhanced training for USQ evaluators is under development, as discussed in the Management (MG) section of this report. Management attention was appropriately placed on this area of concern, to include reconsideration of certain individuals as screeners and evaluators, supplemental training for specific individuals, monitoring of USQ Determination performance by NS&L, and to some extent, elimination of excessive conservatism in the AB. Despite these improvements, ORP and CHG have reported continuing problems with the quality of the USQDs. In July 2002, DOE ORP drafted a Safety Evaluation Report for the Calendar Year 2001 Annual Update of Tank Farms Final SAR and the Fiscal Year 2001 Annual USQ Report, and met with CHG to explain issues they had with inadequate determinations. Interviews with ORP revealed recent examples of inadequate USQ determinations, including the following:

- The revised Safety Equipment List did not properly classify items whose failure could increase the probability of an accident, TF-01-0709
- USQ evaluation did not adequately demonstrate that the installation of flexible ducts on passive ventilation risers did not pose a USQ, TF-01-0688

In addition to the ORP review, a percentage of the screenings and determinations prepared each month are reviewed by NS&L with respect to the deficiencies noted in the July 2001 EH-22 Focused Review **(HAZ-S-3)**. A 30% sample of the screenings (17) and determinations (45) completed during May 2002 was examined. Two screens lacked adequate technical information within the screening questions bases to justify a negative response. Four USQDs were regarded as containing a substantive deficiency and one USQD was identified as containing excessive editorial deficiencies. However, trending has indicated that improvement has occurred since the July 2001 - EH-22 Focused Review. Although management attention has improved implementation of the USQ process, CHG recognizes that use of the USQ process still needs significant work. One item under consideration is use of NS&L as a second screener/evaluator of all USQDs.

Three USQ screeners/evaluators demonstrated their use of the process. No deficiencies were noted, however all of these individuals worked in the NS&L group. The procedure that provides instructions for conducting USQ evaluations for the Tank Farm Contractor nuclear facilities revealed that USQ screeners and evaluators must go through numerous safety basis documents to perform a USQD. Attachment A of this procedure lists 9 pages of Tank Farm AB document references that must be reviewed, some dating back to 1994, in addition to the Final Safety Analysis Report, Technical Safety Requirements, and several USQ bulletins containing AB changes. The Licensing Manager stated that one contributor to the long AB reference list was the backlog of AB amendments (approximately 8 at the current time) waiting for ORP approval. According to the ORP safety analysis subject matter experts, the quality of the AB amendments is not up to par and often requires extensive input into the Safety Evaluation Report (SER) written by DOE to substantiate the approval. Thus, the SERs add to the references listed in Attachment A. This leads to a cumbersome review process and increases the potential for errors in missing a document needed for the review or not being clear on what the current AB includes **(HAZ-3)**.

Training of USQ screeners and evaluators was identified as an issue in the July 2001 EH-22 Focused Review. CHG has addressed this deficiency, but deficiencies remain. (See Management (MG) section of this report).

Conclusion

The objectives have been met. The full spectrum of hazards associated with the Scope of Work is identified, analyzed, and categorized. Those individuals responsible for the analysis of the environmental, health and safety, and worker protection hazards are integrated with personnel assigned to analyze the processes. An integrated process has been established and is utilized to develop controls that mitigate the identified hazards present within a facility or activity. The set of controls ensure adequate protection of the public, worker, and the environment and are established as agreed upon by DOE. These mechanisms demonstrate integration, which merge together at the workplace.

Issues

HAZ-1 Better preparation prior to Enhanced Work Planning sessions could improve hazard analysis efficiency.

HAZ-2 Required radiological hold points are not always formally specified in work procedures.

HAZ-3 The current AB for the Tank Farms is excessively complex which increases the potential for inadequate USQ screens and reviews.

Strengths

HAZ-S-1 CHG has a comprehensive process for planning work that is defined in procedures.

The new Hazards Review Module is improving the way hazard controls are specified in work instructions.

HAZ-S-2 Initiation of the Technical Working Group is an improvement in AB hazards analysis since the July 2001 - EH-22 Focused Review, and appears to be a good process in development of the DSA.

HAZ-S-3 Nuclear Safety & Licensing continues to issue monthly reports on the effectiveness of enhanced training for USQ evaluators, to improve the quality of USQ determinations and evaluate the need for further corrective actions.

Submitted		
David H. Brown	Linda Quarles	Team Leader T. Zack Smith

Functional Area: MG	Objectives MG.1, MG.2, MG.3 Date: 09/16/02

Objectives:

MG.1 An integrated process has been established and is utilized to identify and prioritize specific mission discrete tasks, mission process operations, modifications and work items. (Appendix 3, MG.1, DOE-HDBK-3027-99)

MG.2 Clear and unambiguous roles and responsibilities are defined and maintained at all levels within the facility or activity. Managers at all levels demonstrate a commitment to ISMS through policies, procedures, and their participation in the process. Facility or activity line managers are responsible and accountable for safety. Facility or activity personnel are competent commensurate with their responsibility for safety. (Appendix 3, MG.2, DOE-HDBK-3027-99)

MG.3 An integrated process has been established that ensures mechanisms are in place to ensure continuous improvements are implemented through an assessment and feedback process, which functions at each level of work and at every stage in the work process. (Appendix 3, MG.3, DOE-HDBK-3027-99)

Records Reviewed:

- USQ Qualification Program Description, HNF-IP-0842-III-10.8
- Industrial Hygiene Technician Qualification Program Description, HNF-IP-0842-III-10.15
- Safety And Health Management Program Description, RPP-MP-614
- Job Hazard Analysis, TFC-ESHQ-S_SAF-C-02
- Pre-Job Briefing, HNF-IP-0842-5-4.2
- Performance Indicator Program, TFC-PRJ-PC-C-11, Rev A
- EH-22 Report on "Focused Review of the River Protection Project" dated August 9, 2001
- ORP Response to the EH-22 Report dated April 2, 2002
- USQ Qualification Program (Manual HNF-IP-0842)
- USQ Evaluator Qualification List
- Operations Engineer Qualification Card and Guide
- Operations Engineer Qualification List
- TFC Safety Basis Training – Enhanced Training Plan
- RPP Authorization Basis Training Program (Course 350933)
- RPP Authorization Basis and Unreviewed Safety Question Program (Course 350935)
- CHG Self-Assessment and Trend of USQ Performance (April 2002, May 2002)
- Program Integration – Management Directive
- Program Interface Meeting agendas (6)
- Baseline Change Request Process Procedure – DRAFT
- Technical Categorization Criteria Procedure – DRAFT

- CHG Technical Categorization of Scope (Work Prioritization List)
- TFC-PLN-03, Rev A, Engineering Program Management Plan
- HNF-IP-0842-2-2.7, REV 0, 12-Week Rolling Schedule
- TFC-OPS-MAINT-C-01, Tank Farm Contractor Work Control
- Monthly Performance Indicators for May – July 2002
- Tank Farm Restoration and Safe Operations Monthly Performance Report for May and June 2002
- W-314 Tank Farms Restoration and Safe Operations P-3 Schedule dated 9 Sep 2002
- Draft Occurrence Report for PER-2002-4943 issue
- W-314 Project Meeting Minutes regarding discussions of configuration control problems with modifications in the Tank Farms.
- W-314 MPS Impact Status matrix prepared during post-incident investigation
- HNF-IP-0842-2.8 Operations Human Performance Event-Free Clock
- HNF-IP-0842-4.6.4 Event Investigation And Critique Process
- HNF-IP-0842, Volume 11, Section 1.7, Rev 0b, Problem Evaluation Request
- TFC-PLN-05, Rev A, Conduct Of Operations Implementation Plan
- TFC-OPS-OPER-C-03, Senior Management Observation Program
- TFC-PRJ-PC-C-11, Rev A, Performance Indicator Program
- EH-22 Report on "Focused Review of the River Protection Project" dated August 9, 2001
- OPR Response to the EH-22 Report dated April 2, 2002
- EIT On Call Schedule for June 24 - October 7, 2002
- Senior Safety Review Board Report Number 4 dated April 8, 2002
- Senior Safety Review Board Report Number 5 dated July 12, 2002
- Root Cause Analysis PER-2002-3966
- Root Cause and PER Resolution Grading Summary, CARB Meeting 2002-24, PER 2002-3966
- Audit Report RPP-A-02-03, Rev 0, River Protection Project, Audit of Quality Improvement
- Management Self Assessment Report on Lessons Learned Program dated March 21, 2002
- Focused Review of the River Protection Project Safety Issues Corrective Action Plan DOE/ORP-2001-23
- MEMORANDUM DOE/ORP Subject: Focused Review of the River Protection Project Safety Issues Corrective Action Plan (CAP), Revision 1 to: Jessie Hill Roberson, Assistant Secretary for Environmental Management, EM-1, HQ, dated 4/2/2002
- DNFSB letter from J.T. Conway, Chairman to Jessie Hill Roberson, Assistant Secretary for Environmental Management, EM-1, HQ dated October 2, 2001
- MEMORANDUM DOE Subject: Focused Review of the River Protection Project Safety Issues Corrective Action plan (CAP) to: Harry L. Boston, Manager, Office of River Protection (ORP) dated 3/8/2002
- Root Cause Analysis – Cold Test Facility Electrician Burned
- Thompson Mechanical Contractors, Inc – Corrective Action Plan (TMCI-380363-2002-01)
- Briefing to Senior Management on Radiological/Chemical Contamination at TX Tank Farm
- Causal Evaluation on Radiological/Chemical Contamination at TX Tank Farm Problem Evaluation Request (PER) – PERs of varying subject matter (approximately 50)

Observations:

- Weekly planning meetings for Double Shell Tanks, Interim Stabilization, and Characterization
- 12-week Rolling schedule Update
- Weekly status updates for current work
- Daily planning meetings for all work centers
- Senior Management Meetings on Investigation of Project W-314 Loss of Configuration Control
- Monday morning Tailgate meeting for Single Shell Tank Farms
- CARB (Corrective Actions Review Board) Meeting on September 9, 2002
- PER Screening Meeting on September 10, 2002
- Morning Management Meeting on September 11, 2002
- Special Meetings of Senior Management to Investigate W-314 Loss of Configuration Control (2)

Interviews:

- Deputy General Manager
- Double Shell Tank Farm Facilities Director
- Single Shell Tank Farm Facilities Director
- Single Shell Operations Manager
- A, AX, & AY Complex Manager
- AN and AP Complex Manager
- W-314 Project Manager
- SY-101 Project Manager
- C-104 Retrieval Project Manager
- Design Engineering Manager
- Chief Financial Officer
- Deputy Chief Financial Officer
- Baseline Planning Lead
- System Engineering Director
- Nuclear Safety Services Manager
- Industrial Hygiene Manager
- Waste Transfer Containment System Engineer
- 702-AZ System Engineer
- Instrument and Service Air System Engineer
- Industrial Hygiene Technician
- Vice President for Operations
- Assessment Program Manager
- Corrective Action Manager
- Corrective Action Management Project Manager
- Lessons Learned Program Manager
- EIT Team Leader

- Lessons Learned Coordinator
- Corrective Action Management Staff Member
- Root Cause Analyst

Prioritization of Major Work Activities and Projects

CHG work is prioritized using good practices. Hierarchy of work activities is based on hazard to public, worker and environment. Major work activities and projects have been categorized into hierarchy groups such as Mission Minimum Safety, Regulatory Compliance, Mission Support and Operational Enhancements. This categorization and prioritization was reviewed in the CHG Technical Categorization of Scope. The categories are appropriate for the planned work activities. The Program Integration Group (PIG), established by management directive establishes contractor priorities based on sound principles; however, the process of prioritization is not controlled by manual or procedure. Additionally, other activities affecting work prioritization such as the proposed improved Baseline Change Request process have not been formalized by procedure (**MG-1**). CHG does have mature drafts of the procedures needed to formalize these activities. No issues were identified during this review that resulted in improper prioritization of work that directly affected the safety of operations.

Special project priorities are established to meet milestones in the Tri-Party Agreement or in DOE-provided Performance Incentives. Each Project Manager is responsible for keeping the project on schedule. Formal tracking of all tank farm activities is accomplished through a formal computer tracking system. Each work center uses a specific schedule to coordinate work activities and is integrated through the central work control center.

The 12-Week Rolling Schedule and Tank Farm Contractor Work Control procedures establish the roles and responsibilities for performance of Tank Farm mission-related tasks. Interviews with CHG staff indicated that personnel understood the prioritization process, what work had highest priorities, and which work was of lower priority. Interviews with tank farm managers demonstrated they understood operational priorities and were keeping their staff informed of changes when necessary.

Weekly and Daily planning meetings were observed for implementation of the work control process, establishing work priorities, and scheduling work activities. The Work Week Manager controls all work within the tank farms (both normal and Project). At the weekly planning meetings, the Work Week Manager updated the latest input from Projects, craft support, special external support (cranes, cement trucks, etc.) to establish the weekly and daily work activities. Conflicts within the work areas were resolved through a discussion between Complex Managers, Planners, craft supervisors, and the Work Week Manager. The process was mature and appropriately implemented (**MG-S-1**).

For additional detail regarding short-range work prioritization see discussion provided in the OP discussion.

Training and qualification program

CHG has a training and qualification program for the disciplines that identify hazards and specify controls. The program is managed by a training organization that issues qualification cards and conducts most training. Managers of the disciplines provide the majority of the input used in developing the qualification cards.

For some disciplines, such as USQ screeners and evaluators, a qualification process has been in place for several years. For other disciplines, such as industrial hygiene technicians, qualification cards were developed following the July 2001-EH-22 Focused Review. The System Engineer qualification program is a little more than a year old, and many system engineers have only completed an interim qualification process. The director of System Engineering anticipates all system engineers will be fully qualified within the next three months.

The qualification processes described in the qualification cards were coherent, combining education, classroom training, and practical experience. The qualification processes for USQ screeners and evaluators specified a requalification period of two years. Others, such as for industrial safety and industrial hygiene personnel, did not specify continuing training requirements. Some managers review the qualifications of their people periodically, but this was not specified in a procedure. Several managers also stated that they reviewed qualifications about once per year and specified refresher or additional training activities.

USQ Evaluations and Evaluator Training

The CHG self-assessment of the Unreviewed Safety Question (USQ) program was reviewed. CHG identified that deficiencies in USQs and Unreviewed Safety Question Determinations (USQDs), related to technical content, is continuing to occur; however, the frequency of errors is declining, indicating that the quality of the USQs and USQDs is improving. For example, the technical content error rate for USQDs for October 2001 was 48% and decreased to 9% for May 2002 **(MG-S-5)**. Cognizant DOE-ORP personnel concurred with the CHG assessment that improvements are occurring. CHG has implemented a tracking system that identifies USQ evaluators with high USQ/USQD error rates. Evaluators with high error rates are provided additional training. If error rate performance is not improved, the poor performers are removed from the qualified list of evaluators.

During review of the USQ Evaluator Training Program, it was determined that USQ evaluators are not required by the current training program requirements to complete training on the process and systems they are preparing USQ screens and determinations on **(MG-2)**. However, this training is required for Operations Engineers. This training program weakness is a likely contributor to the USQ/USQD technical errors. Although most of the evaluators demonstrate knowledge of the process and systems, process and system training should be a requirement of the USQ Evaluator qualification program to ensure that evaluators are competent commensurate with their responsibilities.

Industrial Hygiene Technician Training

The recently implemented qualification programs for Industrial Hygiene Technician (IHT) and Industrial Hygiene Professional (IHP) were reviewed and determined to be adequate. Both programs specified entry requirements such as a Bachelor of Science in Industrial Hygiene for the IHP. The qualification cards also specified training requirements that are consistent with the support an IHT/IHP would provide for the high level waste tank farm operations. IHTs that were present on observed work activities were interviewed. The IHTs were knowledgeable in the use and limitations of the monitoring instruments used (organic vapor and ammonia monitors and flammable gas detection) and had a good understanding of basic industrial hygiene principles. The IHTs indicated they have professional industrial hygienists that provide the overall monitoring strategy for each particular job and provide additional consultation when needed.

Problem Evaluation Requests

The Problem Evaluation Request (PER) System has been in use at the Hanford Tank Farms since February 2002. It is a zero-threshold process that enables all personnel the ability to initiate a PER for any quality related deficiency or process improvement evaluation. The PER process directly addresses the lack of feedback and improvement in the CHG ISMS noted by recent evaluators.

The web-based system is user-friendly. Anyone can easily go to the CHG website and originate a PER. Currently there are 600+ PERs generated monthly at the Hanford Tank Farms. This is a considerable administrative burden to which CHG Management devotes significant resources. The delinquency rate for corrective actions required from PER processing is 41% overall with Engineering at 57% as of September 9, 2002. The trend is coming down but this is still a significant overdue rate **(MG-3)**. The average time from PER origination to Senior Management review and approval by the Corrective Action Review Board (CARB) of action(s) taken for significant issues (~1% of all PERs generated) is approximately 40 days. This is a great improvement over earlier review periods and the trend is improving. The quality of the reviews is also improving. The CARB grades each issue and the percentage of processed issues getting passing grades has significantly improved since the start of the PER program **(MG-S-3)**.

A daily PER Review Committee meeting was attended on September 10, 2002. The meeting was conducted by the Corrective Actions Manager and meeting attendees were from specific organizations with special interest in maintaining high standards within the process. Each PER was reviewed before the meeting by the participants, and a thorough discussion of the importance of the request was conducted. A decision was made in this meeting to either refer the PER to a manager for resolution or trend the item.

A daily management meeting was attended on September 11 where the PERs from the previous days PER Review Committee meeting was presented by the Corrective Action Manager and was discussed by Tank Farm Directors and Senior Management. The Corrective Action Manager discussed the recommendation of the Review Committee and the Managers could accept the decision or change it based on management's perspective of the importance of the PER. In nearly all cases, management accepted the Committee's recommendation.

A meeting of the CARB was attended. All personnel attending were professional and freely participated in the discussion. The issue that was reviewed was the root cause analysis of the failure to prevent unauthorized dome loading of a waste tank after implementation of corrective and compensatory actions to prevent it. The meeting proceeded in an orderly manner and effectively dealt with the issues.

Lessons Learned

The Lessons learned manager demonstrated strong knowledge and ownership of the program. The manager demonstrated the ability to prioritize lessons learned so that the most important lessons receive the highest level of attention. A process is in place for differentiating between the applicability of lessons learned. The Lessons Learned manager and coordinator ensure that lessons learned are distributed to the appropriate work groups. This practice ensures work groups are provided with lessons learned information relevant to their work activity, while preventing excessive distribution of material that may overwhelm them. The capability exists for lessons learned information for specific work packages (including post-job review information) to be placed in a database and accessed by work planners during work package preparation. However, work planners demonstrated difficulty in using the database and often were not able to retrieve relative lessons learned information on the proposed work activity. This deficiency was identified in a program self-assessment. The self-assessment deficiency was subsequently closed based on a change to an administrative procedure; however, the problem continues to exist. A similar PER was generated the week prior to the ISMS Review regarding this issue. The PER identified the non-use of the Post Job Review information.

CHG did conduct a thorough self-assessment of their lessons learned program. The assessment evaluated the program internally and also compared performance against a commercial nuclear utility and another DOE site. The assessment identified several valid opportunities for program enhancement. Although some weaknesses in the lessons learned program were identified as discussed above, the CHG Lessons Learned Program concept is sound and should improve with maturity, additional interface with end-users and training of end-users **(MG-S-5)**.

Tailgate Safety Meetings

Each Monday morning each work center conducts a "Tailgate" meeting with craft and staff to discuss safety topics, recent events, and issues management deems necessary to communicate to the staff. Recent Tailgate topics were reviewed and found to be relevant and timely. The process has matured and appears to be well accepted by craft and staff **(MG-S-2)**.

Change Control/Configuration Management

During the ISMS assessment, an issue was identified that resulted in a stop work order for one of the large projects in the Tank Farm. It was discovered that a portion of the project work on the Master Pump Shutdown System (MPSS, W-314 Project), which was being done outside the oversight of the operations organization, actually modified some safety related equipment **(MG-**

4). This was discovered when the operations organization (Double Shell Tank Organization) could not perform the Leak Detector Test for AW Tank Farm.

When management learned of the problem, a stop work order was issued. A senior level mangers meeting was convened to initially determine the potential breadth and depth of the problem. A Problem Evaluation Request (PER) was prepared on the incident and an Event Investigation Team was formed. The ISMS Team followed the handling of this issue closely.

The CHG Deputy General Manager handled the issue personally. He convened a meeting of his direct reports to quickly determine plant status and the fundamental cause of the loss of configuration control of the operational plant. Over the span of two days the Senior Managers analyzed the situation, determined the extent of the problem, and proposed a remedy to avoid similar problems in the future. This entire effort was strongly driven from the Deputy General Manager level and therefore received the highest priority and detailed attention. The fundamental problem, however, was not new. It was well known that there were similar change control problems associated with the W-314 Project at least since April 2002 when a PER was prepared (PER-2002-2025). This PER sites an effort to "set up a configuration management system for major projects that modify existing facilities and their affected drawings has been ongoing for more than 3 years".

Senior management determined that the existing procedures were adequate to prevent the loss of configuration control that occurred but they were not adhered to in all instances. A Memorandum of Understanding that had been prepared to deal with the lack of configuration control appears to have been more of a cause for the problem than a solution in that it diluted responsibilities and confused requirements. A Standing Order was prepared to deal with the problem in the short term. The long-term solution will be changes to existing procedures and/or generation of new procedure(s) to clarify the Program/Engineering/Operations interface so that positive configuration control is maintained at all times **(MG-4)**.

Response to EH-22 Assessment

The DOE HQ Office of Environment, Safety and Health completed an independent assessment of the CHG in July 2001. A DNFSB criticism from an October 2, 2001 letter to EM-1 regarding the Hanford Tank Farms included the statement "To date, the corrective action plan (CAP) for the EH-22 Assessment has not been put in place". Since then, a corrective action plan has been implemented and reported to and approved by the Assistant Secretary for Environmental Management. The CAP is comprehensive in that it addresses all areas of concern in the EH-22 report. Presentations have been made to the DNFSB regarding the CAP implementation. Progress meetings are held weekly with ORP regarding the corrective action status of the items in the plan. The CAP is receiving appropriate management attention by both CHG and DOE/ORP Management.

Safety Initiative

Five safety events, which were determined by CHG to be the five most significant events during the past six months, were reviewed with the Acting Vice President of Nuclear Operations to

assess management actions taken to evaluate, resolve and prevent recurrence. Each of the events was thoroughly investigated and adequate actions were taken to evaluate, resolve and prevent recurrence. For example, on May 20, 2002, approximately 2 liters of liquid from a waste tank were spilled from the end of a water lance assembly onto a worker (rigger). The event was investigated on the day of the event and follow-up investigations were completed. The event was evaluated by CHG to assess the cause of the spill and the response to the employee following the event. Design modifications to the lance were completed to prevent recurrence. As a result of follow-up investigations, CHG determined that management response to the affected employee was inadequate. Senior management received briefings on the event and the necessary corrective actions to ensure a better response to chemical and/or radiological contamination events.

In an event on July 15, 2002 involving access to an energized panel (PER 2002-3797), a subcontractor electrician received burns while attempting to place a 60-amp breaker in the main electrical distribution panel at the Cold Feeds Test Facility. CHG required the subcontractor to prepare a corrective action plan for CHG approval and implement the specified corrective actions. The corrective action plan prepared by Thompson Mechanical Contractors Incorporated (TMCI) provided provisions such as:

- All TMCI subcontractor personnel will receive retraining on job hazard analysis
- All TMCI subcontractor personnel will receive retraining on attendance requirements for Plan-of-the-Day.
- Subcontractor employee performing work without lockout installed is barred from TMCI worksites for minimum of 6 months
- Increased detail in POD meetings for subcontractor personnel

Additionally, CHG has scheduled management assessments of work control practices employed by subcontractor personnel at CHG facilities. This action demonstrates CHG's recognition of responsibility for subcontractor activities and is consistent with DOE's Safety Management System Policy and the DOE Acquisition Regulations **(MG-S-4) (MG-S-6)**.

Conclusion

The objectives for this functional area have been met. An integrated process has been established and is utilized to identify and prioritize major work activities and projects. Clear and unambiguous roles and responsibilities are defined and maintained. Managers demonstrate a commitment to ISMS through policies, procedures, and their participation in the process. Facility or activity line managers demonstrate responsibility and accountability for safety. Facility or activity personnel are competent commensurate with their responsibility for safety. An integrated process ensures continuous improvements are implemented through an assessment and feedback process.

Issues

MG-1 The process for Integrated Priority Planning should be formalized by procedural requirements.

MG-2 USQ Evaluators are not required to complete training on the processes and systems they are preparing USQ screens and determinations on.

MG–3 The delinquency rate for corrective actions coming from the PER System is excessive.

MG-4 Configuration management and work control coordination between Projects and Operations needs improvement.

Strengths

MG-S-1 The work prioritization and control process appears to be mature, well understood, and integrated into normal CHG activities.

MG-S-2 Tailgate safety meetings are relevant and timely.

MG-S-3 The PER process provides a comprehensive method to document and track problems with the operation of the tank farms. Progress has been made in implementing the system.

MG-S-4 Management has shown the desire to find and fix problems. This willingness to correct errors is the basis for recent improvements.

MG-S-5 Improvements in the management assessment program have provided good returns in the USQ Process review and the Lessons Learned Program review.

MG-S-6 Senior personnel changes by CHG are having a positive influence on attention to detail and safety integration at the tank farms.

Submitted **Chris Bosted**	**Team Leader** T. Zack Smith **T. Zack Smith**

Functional Area: OPERATIONS	Objectives OP.1 Date: 09/16/02

Objective:
OP.1 An integrated process has been established and is utilized to effectively plan, authorize and execute the identified work for the facility or activity. (Appendix 3, OP.1, DOE-HDBK-3027-99)

The Criteria and Approach used in this assessment of this functional area are provided in the Criteria, Review and Approach Document (CRADs). See Volume II of this report (Attachment A of the Review Plan).

Records Reviewed

- Authorization Agreement, CHG-5980
- Tank Farm Contractor Work Control, TFC-OPS-MAINT-C-01
- Job Hazard Analysis, TFC-ESHQ-S_SAF-C-02
- Senior Management Observation Program, TFC-OPS-OPER-C-03
- Conduct of Operations Implementation Plan, TFC-PLN-05, Rev A
- Safety Meetings, TFC-ESHQ-S_SAF-C-02
- Performance Indicators – Development, Analysis, and Reporting, TFC-PRJ-PC-C-01
- CHG Project Control System Description, RPP-7725
- Tank Farm Health and Safety Plan, HNF-SD-WH-HSP-002
- Technical Procedure Format & Preparation Standard, HNF-IP-0731
- Industrial Hygiene Technician Qualification Program, HNF-IP-0842, Vol. 3, Sec. 10.15
- Pre-Job Briefing, HNF-IP-0842, Vol. 5, Sec. 4.1
- Hazard Communication, HNF-IP-0842, Vol. 9, Sec. 4.1
- Respiratory Protection, HNF-IP-0842, Vol. 9, Sec. 4.2
- Electrical Safety, HNF-IP-0842, Vol. 9, Sec. 4.28
- Industrial Hygiene Personal Monitoring Program Plan, HNF-IP-0842, Vol. 9, Sec. 4.4
- Walking/Working Surfaces, HNF-IP-0842, Vol. 9, Sec. 4.33
- Occupational Medical Monitoring, HNF-IP-0842, Vol. 9, Sec. 4.34
- Standing Job Hazard Analyses (various) based on the Hazard Review Module
- Plan-of-the-Week Schedules (4)
- Daily (Work) Release Sheets
- Work package instructions and procedures for observed work activities
- RPP Routine Work Request Form
- Management Observation Program (MOP) Checklist Form
- Senior Management Observation Program (SMOP) Input Form
- Monthly Operations Report summarizing SMOP, MOPs, and Management Assessment Reports
- Problem Evaluation Requests (several)

- CHG Performance Indicators Report for July 2002

Interviews Conducted

- CHG Work Planners for Interim Stabilization (IS), Characterization, Single Shell Tanks (SST) and Projects
- CHG Field Work Supervisors
- CHG Nuclear Chemical Operators, Health Physics, Instrument and Industrial Hygiene Technicians, and Electricians
- CHG Maintenance Supervisors (First Line Supervisor)
- CHG Maintenance Hazard Analysis Facilitator
- CHG Maintenance Managers (Double Shell Tanks (DST) East, SST West, and Crafts)
- CHG ESH&Q Senior Technical Advisor
- CHG Shift Directors (2), Shift Managers (2), and a Shift Operations Engineer

Observations

- CHG Tailgate Meeting
- CHG Maintenance Safety Meetings for DST, SST and IS
- CHG Plan of the Day Meetings
- CHG Pre-job Briefings
- CHG Shift Turnover (Midnight)
- Transfer from 244-BX DCRT to 241-AP-102 (Procedure TO-270-013) (Swing Shift)
- Installation of Hose-In-Hose Transfer Line into S-C Valve Pit (Work Package WS-00-218)
- Pit 241-AN-103 Preparation and Application of Special Protective Coating (Work Package ES-02-00046)
- Function Test 241-AW Primary Exhauster HEPA Filter Differential Pressure Interlock System (TSR Surveillance Procedure TF-FT-239-018) (Swing Shift)
- Replace FIC at 241-AZ-102 with ENRAF Level Indicator (Work Package 2E- 98-00696)
- Replace Single Shell Tank Breather HEPA Filter (Work Package 2W-02-01116) and Aerosol Testing of HEPA Filters (TSR Surveillance Procedure 3-VB-157) (two Tank Farms)
- Monthly CAM Source Checks (TSR Surveillance Procedure TF-OPS 012) and Record Sampler Filter Changes (TF-OPS-006) and Daily CAM Operability Checks (TSR Surveillance Procedure TF-OPS-005)
- Install Exhauster at Tank C-103 – (Work Package WS-02-0236) (Swing Shift)
- CHG Building 2703E Interim Stabilization Maintenance Facility
- CHG Building 272AW Maintenance Shops
- CHG Building 272WA Maintenance Shops
- CHG 2707-SX Craft Shops
- CHG Central Command and Control

Discussion of Results

Work Planning

CHG has effective procedures to ensure operational and maintenance work is planned, scheduled, and authorized. The Tank Farm Contractor Work Control procedure, TFC-OPS-MAINT-C-01, provides a reasonable graded approach to the level of rigor applied to the planning and control of work based on the work complexity and hazards that may be present. Work instructions are captured in detailed work packages, operating and maintenance procedures, written routine work requests, or verbal direction. Work is authorized by the Shift Manager in the Central Command and Control organization using the Daily Release Sheets.

One field activity suffered from insufficient work planning. When the Characterization group attempted to perform a work package to connect a portable exhauster to single-shell tank C-103, field work was stopped prematurely when the crew discovered that the actual riser configuration differed from what had been assumed during planning. Non-specific engineering drawings for risers in this particular tank farm and metallic tape covering much of the riser cover contributed to the lack of precise understanding. The job-specific radiological work permit was not written to address the actual contamination levels found in the field. Only one industrial hygiene technician was assigned for the job, when two would have been more appropriate for this tank because of its high vapor emissions.

Procedure Development

The review team found that CHG requirements for procedure step sequencing were not always followed. CHG administration and conduct of operations procedures require that work procedure steps be performed in sequence. The only exception allowed by the "Technical Procedure Format and Preparation Standard", HNF-IP-0731, is when the work procedure includes a statement within a section specifying individual steps that may be performed in parallel or out of sequence. Contrary to the requirement of HNF-IP-0731, section 7.9.3, several procedures had blanket statements allowing all steps to be performed out of sequence. For example, the Tank Farm operating procedure titled, "Clean Level Indicating Transmitter Tapes, Plummets, and Displacers," TO-020-420, Rev. E-22, contained a general information note 2.2.7 that stated, "Sections or steps within this procedure may be performed out of sequence, as required for maintenance or plant conditions." When the review team brought this to the attention of the CHG management, CHG found four other maintenance procedures with the same statement. Other procedures evaluated by the review team addressed step sequencing correctly.

Readiness to Work

CHG employed sufficient mechanisms to ensure the facility was in an adequate state of readiness prior to authorizing the performance of work. The Shift Director, Shift Manager, and Shift Operations Engineer worked together in the Central Command and Control station to maintain current status of tank farm conditions and evolutions. Work packages and procedures that would impact Technical Safety Requirement (TSR) controlled equipment contained specific steps to

obtain Shift Manager authorization prior to removing such equipment from service. This communication link allowed the Shift Manager to take the appropriate actions to maintain compliance with the TSR. Recent improvements included a computerized action tracking system with a wall projector to provide a real-time status of important actions with due dates and times. To ensure waste tank domes are not overloaded with portable equipment, the Shift Manager used a convenient dome loading program that quickly provided allowable load margins – a significant improvement over past methods that resulted in several TSR non-compliances.

CHG supervisors were inconsistent in verifying that personnel assigned to a task were trained and qualified to perform that task. In response to the July 2001, EH-22 Focused Review, CHG committed to verify that all personnel are properly trained prior to conducting the work, and included this in a new requirement in the "Pre-Job Briefing" procedure, HNF-IP-0842, Vol. 5, Section 4.1, paragraph 3.1, step 1. This verification requirement is a precursor to conducting the actual pre-job briefing; however, only one field work supervisor reported using the training web site and making contact with applicable supervisors to verify worker training prior to the work. This particular field work supervisor also reported that he identified a craft worker without the required training and excluded the worker from the job. Some field work supervisors observed during the remaining pre-job briefings simply asked their assigned personnel for the job if they were trained per the prerequisites section of the work instructions and performed no further verification. One supervisor believed that the Access Control Entry System (ACES) would verify the training was current, but this system does not track all the necessary training and qualifications. Some did not verify training at all, but because many tank farm tasks are performed repeatedly with the same working crews, supervisors may have relied on past training checks **(OP-1)**.

Field work supervisors demonstrated capable leadership and control of the field work. The review team observed several work activities and observed timely direction from the supervisors as well as good procedure compliance. The pre-job briefings were typically comprehensive, covering the hazards, the controls and the work activities to be conducted **(OP-S-1)**.

One field work supervisor failed to obtain an accurate status of in-progress tank farm transfers prior to initiating a transfer from the 244-BX Double Contained Receiver Tank to double-shell tank AP-102. Due to misinformation and incorrect assumptions, one safety-significant valve was not checked shut and independently verified in accordance with TSR requirements prior to the transfer.

Hazard Control

The review team observed two safety hazards. These hazards were previously recognized by CHG personnel, but there had been no urgency to correct the unsafe conditions. The first hazard was encountered during a job to paint special sealant in a waste tank valve pit surrounded by a temporary enclosure. The walking/working surface around the pit was strewn with excess material and electrical bonding wires that caused tripping hazards (actual tripping occurred at the time of the observation without injury). An equipment box had been on order for an extended period to provide a storage place for the excess material, but had not yet been received. The second hazard was worker exposure to unguarded electric (110 volt) terminals on an open HEPA

filter exhaust differential pressure interlock panel in 241-AW Tank Farm. While a qualified electrician was present at the panel, technicians worked in close proximity (within 1 foot) to the exposed terminals for approximately 2 hours. The hazard had been previously recognized by the instrument technicians, and insulating material for use as an engineering control was procured, but it was not yet installed as a guard. No Problem Evaluation Requests (PERs) were submitted to assist in the tracking of the planned corrective actions **(OP-2)**.

Work Authorization

CHG has a mature process for authorization of field work. CHG Facility Managers meet daily with first line supervisors, planners, and schedulers to promulgate work priorities for the next day. Once the planned work is compiled and listed on the Daily Release Sheet, the applicable work packages are delivered to Central Command and Control for review by the Shift Manager. The Shift Manager reviews the bulk of work packages awaiting release during the night shift, and this review is the final verification of procedure adequacy following reviews by facility management, safety professionals, and operations engineers. By procedure, the Shift Manager must ensure the work log is kept up to date, that hold points and TSR-related actions are clearly indicated, that the appropriate energy isolations, such as a Lockout/Tagout, are in place, and that any plant condition conflicts between individual work packages are resolved. Authorization to perform work is indicated for each package on the Daily Release Sheet. The Shift Manager briefs Work Release Operations Engineers in the morning on the approved work packages, and these Operations Engineers conduct the morning work release meetings with facility management and first line supervisors. There is limited opportunity for day shift personnel to review and release urgent work packages, but due to the higher operations tempo, this was kept to a minimum. The review team observed several instances where specific additional authorization by the Shift Manager was required prior to certain steps in the procedure, primarily for work steps that would impact the TSR controls, and these additional authorizations were completed satisfactorily.

Safety Integrated into Work Performance

CHG has improved its procedures and methods for integrating safety into maintenance and operations work. The "Work Control" procedure, TFC-OPS-MAINT-C-01, and the "Job Hazard Analysis" procedure, TFC-ESHQ-S_SAF-C-02, procedure were effective August 1, 2002 and August 28, 2002, respectively, and together provide a methodology to integrate the hazard analysis and the development of hazard controls into work control documents. The Hazard Review Module (HRM) is a new tool designed to assist work planners and Enhanced Work Planning (EWP) participants to identify hazards associated with the work activities and materials to be used. The HRM is an improvement over the Automated Job Hazard Analysis program previously used, and can help planners build safety controls (including Technical Safety Requirements) directly into the work instructions. The HRM also identifies when the work instructions require review by safety and health subject matter experts (SMEs). Work packages identified SME participation in EWP activities or document reviews when required.

While this new hazard identification process is an improvement, the review team observed a heavy reliance on the use of personal protective equipment (PPE) as hazard controls, e.g., use of

supplied-air breathing apparatus when opening a tank riser. The "Worker Safety and Health Management for DOE and Contractor Employees" order, DOE O 440.1A, specifies a hierarchy of controls that requires consideration of engineering controls and work practice and administrative hazard control methods prior to consideration and use of PPE. The effectiveness of PPE to control the hazard depends on many factors including user training, proper fit testing protocols, matching the PPE to the hazard, and medical qualifications evaluations. The use of PPE also can impact the performance of the worker. PER-2002-4964, submitted during this ISM review, highlighted problems with reliance on PPE. This PER reported that workers, wearing air-purifying respirators with new cartridges designed to protect against organic vapors "smelled" organic vapors during the application of a special protective coating in a waste tank valve pit. The cause for this event was still under investigation. The HRM primarily leads work planners and other users to identify PPE as default controls, rather than consideration for the hierarchy of controls required by DOE Order 440.1A **(OP-3)**.

CHG's incorporation of human factors in procedure design is a noteworthy practice. During this review, operating and maintenance procedures clearly displayed consideration of human factors. For example, verbs were presented in a bold font to identify the action in each step. Also, the procedure-writing standard required hold points to be presented in a very distinctive style **(OP-S-2)**.

Performance Measured

CHG's "Performance Indicators – Development, Analysis, and Reporting" procedure, TFC-PRJ-PC-C-01 established the process for developing and tracking performance measures for the conduct of safe work. The July 2002 monthly performance indicator report provided a comprehensive set of indicators including safety and operations. Each performance indicator with an adverse trend included a corrective action(s) that is to be tracked in the PER system.

Worker Participation

Workers interviewed indicated they had opportunities to be involved in activities to develop work instructions and identify hazards and controls for most work. Crafts and trades involved in any work with a risk ranking of 3 or 4 (on a scale of 1 to 4 with 4 indicating the highest risk work) are included in EWP meetings. For lower risk work activities however, a maintenance supervisor reported some of his workers felt they were not being involved in the Standing Job Hazard Analysis (SJHA) development. The software developer assigned to design and train on the SJHA indicated that this new hazard analysis approach was recently implemented and that worker involvement will increase as the SJHA development activities progress.

The observed weekly tailgate and safety meetings provided timely and useful information and provided an avenue for feedback on safety and health issues. The feedback and discussions appeared to be more interactive in the smaller groups than the Interim Stabilization safety meeting in a large conference room filled to capacity; however, both met the objective.

Feedback and Improvement Systems

CHG has developed a number of computerized systems and mechanisms to provide work planners, engineers and others with feedback and improvement information. These systems include the post-job review (PJR) database, CHG specific lessons learned web page, and the Problem Evaluation Request (PER) system. Work planners interviewed indicated they are starting to use the PJR and lessons learned web page, but they demonstrated only a basic ability to use these tools. None of the planners interviewed indicated they used the PER system as they planned a work package **(OP-4)**. The PER database was well populated with feedback information, but the PJR and lessons learned web page had very little usable information at the time of the review. For example, there was no information in the PJR/lessons learned web page for work at 241-TX-116 where the interior of a water lance became contaminated with tank liquid and later spilled onto a worker (rigger) while being moved. The planners and the field work supervisors will need to make a concerted effort to ensure useful lessons learned information is entered into the PJR and lessons learned web page **(OP-5)**.

The review team noted several instances where workers displayed dissatisfaction with procedures – such as the trend to lengthen Health Physics Technician TSR surveillance procedures with no apparent gain in safety or operability. However, workers had not submitted a PER to start the corrective action process.

CHG has significantly improved the management oversight of tank farm work through a combination of programs. Management assessments provided a more in-depth review of aspects of tank farm operations than previous assessments. The Senior Management Observation Program (SMOP) involves over 35 managers with one manager spending at least four hours per day examining relevant topics according to a quarterly schedule. Under the Management Observation Program (MOP), supervisors complete at least two reports per month on topics pertinent to their area of responsibility. A Senior Technical Advisor developed a feedback process whereby each report is graded and the evaluation is provided to the next applicable level of management. Managers are providing better reports with more significant issues for entry into the PER system. All reports are compiled each month into a summary report for upper management that summarizes and analyzes the results **(OP-S-3)**.

Conclusion

The objective has been met. CHG has established and implemented an integrated process to effectively plan, authorize and execute safe work at the Tank Farms.

Issues

OP-1 Supervisors were inconsistent in whether or how they verified that personnel assigned to a task were trained and qualified to perform that task.

OP-2 Two identified safety hazards (noncompliance with standards) were not promptly abated nor were planned corrective actions tracked.

OP-3 The hazard analysis and control development processes used for work planning do not sufficiently identify the use of engineering controls and work practices and administrative controls as the preferred control methods before consideration of personal protective equipment.

OP-4 Work planners are not proficient in the use of the improved feedback and improvement tools designed to identify lessons learned that should be addressed in work instructions.

OP-5 Field work supervisors and planners are not yet effectively populating the new Post-Job Review and Lessons Learned web page with useful feedback information to facilitate improvements in subsequent work.

Strengths

OP-S-1 Observed field work supervisors demonstrated strong leadership and control of the work activities, as well as exhibiting a comprehensive understanding of the safety and operational requirements.

OP-S-2 Operating and maintenance procedures clearly consider human factors in their style.

OP-S-3 Management oversight of tank farm work has improved structure, scheduling, results, and focus on a feedback process that enables the managers to improve their oversight abilities.

Submitted		Team Leader
Steve Pfaff	Terry Krietz	T. Zack Smith

Team Biographies

Team Leader	**T. Zack Smith**
Senior Advisor	**Tom Pestorius**
DOE	**JJ Hynes**
Hazards	**David H. Brown** **Linda Quarles**
Management	**Chris Bosted**
Operations	**Terry E. Krietz** **Stephen H. Pfaff**

Team Biographies

T. Zack Smith is the Director for the Nuclear Materials Operations Division at the Savannah River Site where he is responsible for the oversight of all activities associated with nuclear materials processing operations. Mr. Smith has 16 years of engineering experience, including 14 years of nuclear experience. He holds a Bachelors of Science in Marine Engineering from the U. S. Merchant Marine Academy.

Previously, as Director of the Laboratory Research Division, Mr. Smith was responsible for oversight of all laboratory research and development conducted by the Savannah River Technology Center that supported multiple sites within the DOE complex and other external government agencies. He also was a senior facility representative (FR) for the DOE High Level Waste Operations Division at the Savannah River Site. He fully qualified as a DOE FR and held FR positions at multiple DOE Hazard Category II nuclear facilities. He has coordinated the oversight for numerous successful nuclear facility construction activities and operational startups. Mr. Smith was the Operational Readiness Review (ORR) Team Leader for the October 2001 Savannah River Site 2H-Evaporator resumption of operations and the June 1996 West Valley Demonstration Project initial startup. He has also held various positions on other ORRs including the Rocky Flats Plutonium Storage and Packaging System, the Waste Isolation Pilot Plant (WIPP) and Pantex Building 12-116. Additionally, he served as a board member on the Savannah River Site F-Canyon Plutonium Intake Type-B Investigation. He has participated in multiple Integrated Safety Management System reviews. Prior to joining DOE, Mr. Smith held positions in nuclear reactor refueling for naval reactors at Charleston Naval Shipyard.

Chris Bosted is the Director of the ORP Operations and Safety Oversight Division where he is responsible for the direction of seven qualified facility representatives, three authorization basis engineers, and the Occurrence Reporting and Processing System program manager. His division provides the majority of the safety and operations oversight of the Hanford Tank Farm Contractor. Mr. Bosted has over thirty-seven years of nuclear experience in Navy, Commercial, and DOE. He holds a Bachelor of Science degree from Idaho State University in Physics. While in the Navy, Mr. Bosted operated several different submarine and prototype nuclear power plants. At the S5G prototype, he qualified on all in hull watch stations. He also qualified as a Reactor Shift Supervisor at EBR-II, where he was also the Reactor Engineer. In the commercial nuclear field, he has worked as a Senior Reactor Engineer for Babcock & Wilcox Co. There he established the post event evaluation program for the B&W NSSS systems. He has also worked as a Senior Engineer at Indiana Power Co. and as a Plant Director for Cincinnati Gas & Electric Co. In 1984, he joined the Nuclear Regulatory Commission at the Palo Verde Nuclear Generating Station and was promoted in 1987 to be the Senior Resident Inspector at WNP-2 near Richland Washington. In 1991, he joined DOE as the Chief of the Quality Assessment and Nuclear Safety Branch. In this position he established the initial independent oversight of the DOE and Contractors organization. He later acted as

the Acting Director of the Performance Assessment Division. In 1995, he was appointed as the Program Manager for the RL Facility Representatives. In 1997, he was promoted to Director of the Waste Operations Division and in 1999 he was moved to the Director of the RL Authorization Basis Division. In 2001, he transferred to the Office of River Protection as the Director of the Operations and Safety Oversight Division. In February 2002, the ORP Authorization Basis Team was included in the OSO Division. Mr. Bosted has certified as an NQA-1 Lead Auditor, ISO-9000 Lead Auditor, and Instructor for MORT and Reasons Root Cause Analysis. He has also taught the NQA-1 Lead Auditor course for the Hanford Quality Training Resource Training Center.

David H. Brown is a quality assurance engineer with the Quality Assurance Office of the Office of River Protection. In this capacity he serves as a lead quality assurance auditor, accident investigator, and operational readiness review team leader among other duties. He has thirty-one years of engineering experience in the nuclear field. He holds a Bachelor of Science degree in nuclear science from the State University of New York, Maritime College.

Prior to coming to work for DOE in 1986, Mr. Brown was a nuclear reactor plant test engineer at Pearl Harbor Naval Shipyard. For five of his 15 years at the shipyard, he served in the capacity of Chief Test Engineer. Since coming to DOE he has been certified as a lead quality assurance auditor under the Richland Operations Office and Office of River Protections NQA-1 program. He is also a trained accident investigator and has completed the DOE Technical Qualification Program requirements in the quality assurance and nuclear safety disciplines. Mr. Brown has served as team leader during four DOE operational readiness reviews and as team member during two DOE operational readiness reviews. He has led an average of about three major quality assurance or other DOE assessments per year for the 16 years he has been with DOE. He has also served as chairman for two DOE Type B accident boards of investigation and has served as the accident investigator for one DOE Type B accident board of investigation. He has also been team lead during various employee concern and management troubleshooting investigations.

J.J. Hynes is the Senior Facility Representative for H-Canyon in the Nuclear Materials Operations Division at the Savannah River Operations Office. Mr. Hynes graduated from Virginia Tech with a B.S. in Biology and a minor in Health Physics and has 20 years of experience in the nuclear field. Prior to coming on board with DOE-SR, Mr. Hynes was employed at the Charleston Naval Shipyard where he served in the Nuclear Engineering Department as a Shift Refueling Engineer, Assistant Chief Refueling Engineer, and Chief Refueling Engineer. Mr. Hynes assumed his present position with DOE in June 1991 and has previously been assigned as a Facility Representative in all Nuclear Materials Operations facilities. Mr. Hynes served as a team member for the Idaho National Engineering and Environmental Laboratory ISMS Phase II, Part II verification and the Phase I and II ISMS verification at Wackenhut Services, Inc. at the Savannah River Site. Additionally, he has been a team leader and team member for several Operational Readiness Reviews and Readiness Assessments for Nuclear Material Stabilization

facilities at SRS. Mr. Hynes served 3 years as Chairman of the Savannah River Facility Representative Council.

Terry E. Krietz is the Safety and Health Site Liaison for the Office of Safety, Health and Security. He has 23 years experience in the safety management field. Eleven of those years were spent developing DOE-wide worker safety and health policy and providing technical assistance to the DOE field elements. He earned Bachelor of Science degrees in biology and geo-environmental studies at Shippensburg University.

Before coming to DOE, Mr. Krietz served as Safety Director at the Sierra Army Depot and the Senior Safety Manager for the U.S. Army Depot System Command. He completed the U.S. Army Materiel Command Safety Management Intern Program and technical training in the chemical, explosives, nuclear, and radiological areas. Mr. Krietz has served as lead, co-lead, or participant on over 40 comprehensive safety and health program evaluations of U.S. Army Depot System Command installations. He has also been accident investigation board chairman for fatality investigations at Anniston and Tobyhanna Army Depots. He has been the lead, co-lead, or participant on pre-operational surveys of toxic chemical weapon operations at Anniston, Blue-Grass, Pueblo, Tooele, and Umatilla Army Depots, and has been the lead for Army safety and health inspections of industrial, explosives and construction operations at U.S. Army Depots. With DOE, he has served as an evaluator for the DOE Voluntary Protection Program evaluations at Savannah River and INEEL and has been an evaluator for DOE EH/EM reviews of site safety and health programs.

Tom Pestorius has 32 years experience with the nuclear industry and government including management, policy, and marketing positions. He has experience as a Naval Officer aboard nuclear powered naval ships, managing projects for nuclear utility power plants, government assignments in Congress and the White House dealing with nuclear regulatory and appropriation issues and extensive experience with the Department of Energy nuclear facilities both in the field and at Headquarters. He has been on Operational Readiness Review (ORR) Teams for K Reactor, HB Line, RTF, DWPF, Bldg. 707 and 371 at RFETS, Pantex Stage Right, Pantex AT400A, F Canyon, FB Line, ITP, SRS Evaporators, TA-55 and the B696R Waste Facility at LLNL. He has been both a Team Leader and a Senior Safety Advisor on ORRs. He has been a Senior Mentor at the RFETS and at Los Alamos National Laboratory Plutonium Facilities (TA-55 and CMR) and at the Plutonium Facility at Lawrence Livermore National Laboratory (B332). He has participated in Integrated Safety Management (ISM) Assessments at the Defense Waste Processing Facility at Savannah River Site, the Waste Isolation Pilot Plant in Carlsbad New Mexico and at the LLNL. He has provided contractor support to the Advisory Committee for Nuclear Facility Safety (ACNFS), which reported to the Secretary of Energy, and to the Director of the DOE Liaison Office to the Defense Nuclear Facility Safety Board (DNFSB). He has testified multiple times at public meetings before the DNFSB regarding ORR results and mentor activities. Mr. Pestorius is also a Past Senior Vice President of the American Society of Mechanical Engineers (ASME), the current Chairman of the ASME Committee on Finance and Investment and

CEO of the Engineering Services Firm H&P, Inc.

Stephen H. Pfaff is a qualified facility representative at the Office of River Protection where he is responsible for oversight of contractor nuclear safety activities at the Hanford Tank Farms. Mr. Pfaff has sixteen years experience in the naval nuclear and DOE non-reactor nuclear fields. He holds a Bachelor of Science degree in business administration and naval science from Oregon State University.

While a Naval officer, Mr. Pfaff qualified as prospective Engineer Officer for the D2G nuclear propulsion plant. After coming to work for DOE, he qualified as facility representative at the Rocky Flats and Hanford nuclear sites. He is an AMSQ-qualified assessment team member and is certified as an NQA-1 lead auditor. He has served as team member during three major technical assessments of Tank Farms vital safety systems in support of the DOE implementation plan for DNFSB Recommendation 2000-2. He has also served as assessment team leader and team member during a variety of quality assurance audits, nuclear safety assessments, and operational readiness reviews. This included serving as team leader for the ORP line management readiness review prior to phase II assessment of tank farm contractor's ISM system.

Linda Quarles has served as Senior Facility Representative for HB-Line Plutonium Processing Facility at Savannah River Site for the last four years. She served as Senior Facility Representative for the laboratory facilities at Savannah River Site for 1 1/2 years where she led a team of two facility representatives who provided oversight of operations in the Savannah River Technology Center, Analytical Laboratories, and TNX facilities. From 1995 to 1997, Ms. Quarles managed the Technical and Operations Assessment Programs, Management Walkthrough Program, and Conduct of Operations Program for the site. For 3 years, she managed the Facility Representative Program. Ms. Quarles led the teams for the startup of Low Assay Plutonium at HB-Line, restart of Zeolite Bed Recovery operations in the tritium facilities, startup of the Health Physics Instrument Calibration Facility, and startup of the Americium/Curium Melter at TNX. Last year, she led the validation review of the WSRC Operational Readiness Review for startup of HB-Line Phase II (Neptunium/Plutonium Oxide Facility). She has also been on the assessment teams for the restart of H-Canyon First Cycle Solvent Extraction, startup of the Non-nuclear Reconfiguration Program (Environmental Conditioning, Functional Test Station, Sample Assay Station, and Vacuum Bakeout) at the tritium facilities, startup of Load Line 6 in the tritium facilities, startup of Container Management Facility in 234-H, tritium facilities "Special Program" startup, and the renovation/startup of DuPont Water facility in D-Area. She has qualified as a facility representative in the tritium facilities, where she worked from 1991 to 1995, and is fully qualified in HB-Line at the present time. Additional operations oversight experience included almost three years as a General Engineer in M-Area Liquid Effluent Treatment Facility and D-Area Heavy Water Reprocessing Operations, prior to her work as a facility representative. Before coming to work for DOE in 1989, Ms. Quarles spent five years as a Petroleum Engineer and Oil & Gas Inspector with the Department of the Interior in Wyoming. She received a B. S. in Chemical Engineering from the University of Pittsburgh.

Appointment Letter

RL-675 (03/99)

United States Government **Department of Energy**

memorandum

Office of River Protection

DATE: AUG 0 9 2002

REPLY TO ATTN OF: AMSR:JHS 02-AMSR-023

SUBJECT: APPOINTMENT AS TEAM LEAD FOR CH2M HILL HANFORD GROUP, INC. (CHG) SEPTEMBER 2002 INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) ASSESSMENT

TO: Thomas Z. Smith, SR

During the period September 9, 2002, through September 20, 2002, the U.S. Department of Energy, Office of River Protection (ORP) will perform an ISMS Assessment of the CHG Contract for Tank Farm Operations. You have been selected to be the Team Leader for the assessment. Attached is a description of this task, prepared in accordance with Appendix 4 of DOE-STD-HDBK-3027-99.

If you have any questions, please call me, (509) 376-6677.

Roy J. Schepens
Manager

Attachment

cc w/attach:
J. M. Allison, SR
T. A. Wyka, Jr., EH-9

CH2M Hill Hanford Group, Inc. (CHG)
September 2002
Integrated Safety Management System (ISMS) Assessment

1.0 Description of Facility/Activity

In accordance with Contract DE-AC27-99RL14047, CHG is responsible for the planning, management, and execution of Tank Farm projects, operations, and other activities. The Tank Farm Facility includes:

- 177 underground single shell (149) and double shell (28) tanks in the 200 East and West Hanford areas,
- Waste transfer systems,
- 204-AR Waste Unloading Facility,
- 244-AR Vault,
- 242-T and 242-S Evaporators,
- Grout Facility, and
- Other miscellaneous equipment items, inactive storage facilities, waste storage pads, etc. as described in the Final Safety Analysis Report (FSAR) (HNF-SD-WM-SAR-067).

This assessment will:

- Determine the effectiveness of CHG's actions to correct deficiencies in their Integrated Safety Management (ISM) implementation, with emphasis on Core Function 5 – Feedback and Continuous Improvement, and
- Evaluate the effectiveness of Department of Energy (DOE) Office of River Protection (ORP) processes, mechanisms, and contractor oversight activities that ensure proper implementation of the CHG ISMS.

Due to the number of corrective actions CHG has implemented in response to prior assessments, this assessment will be performed consistent with the requirements of DOE-HDBK-3027-99 for an ISMS verification.

2.0 Background and History

CHG has a fully mature ISMS. Both Phase I (October 1998) and Phase II (August 1999) verifications have been performed and ORP recently approved Revision 4 of the ISMS Description (RPP-MP-003). Facilities and activities are covered by approved authorization agreements that include a FSAR and technical safety requirements (TSR) documents. A timeline of major ISMS implementation milestones for the Tank Farm Contractor is provided below.

- October 1998, ISMS Phase I Verification.
- May 1999, DOE-ORP Line Management Readiness Review.
- August 1999, ISMS Phase II Verification.
- June 2000, DOE-ORP declares ISM fully implemented at River Protection Project.
- April to July 2001, DOE ES&H Oversight Focused Review (EH-22 assessment).

- October 2001, Defense Nuclear Facilities Safety Board (DNFSB) Letter summarizing concerns with CHG implementation of ISM.
- April 2002, Revision 1 of the corrective action plan developed in response to EH-22 assessment issued.
- June 2002, Revision 4 of CHG ISMS Description issued.

3.0 Scope for September 2002 ISMS Assessment

The purpose of this assessment is to determine the effectiveness of CHG's actions to correct deficiencies in their ISM implementation, with emphasis on Core Function 5 – Feedback and Continuous Improvement. Additionally, this assessment will evaluate the effectiveness of DOE ORP processes, mechanisms, and contractor oversight activities that ensure proper implementation of the CHG ISMS. Due to the number of corrective actions CHG has implemented in response to prior assessments, a focused ISMS assessment will be performed consistent with the guidance of DOE-HDBK-3027-99 for an ISMS verification. The results of this assessment will provide the ORP and CHG with a measure of the effectiveness of corrective actions CHG has implemented to improve its ISM Program and determine if ORP efforts are best focused on supporting effective implementation of ISM by CHG.

Results of the assessment will be structured around the five Core Functions of ISMS in a manner similar to the EH-22 assessment performed in the spring of 2001. Team member qualifications, protocols, assessment plan, final report, and other aspects of this task will be prepared and implemented in accordance with the appropriate guidance of DOE-HDBK-3027-99 and ORP M 220.1. Separate criteria and review approach documents (CRAD) will be prepared using some of the same objectives as those established within DOE-HDBK-3027-99 for an ISMS verification. The criteria and review approach established for each of these objectives will be tailored to specific focus areas based on special considerations for the assessment and results of prior (recent) assessments (see below for details). The CRADs will be included with the draft assessment plan to be submitted for ORP Manager review and approval prior to commencement of the field work portion of the assessment.

Special Considerations for Assessment

- Requirements Basis: DOE directives, Department of Energy Acquisition Regulation clauses, and other applicable requirements are listed in and invoked through CHG Contract DE-AC27-99RL14047. How CHG implements these requirements is further defined by the Authorization Basis, Standards/Requirements Identification Documents, CHG ISMS Description for each core function (Revision 4), and CHG administrative implementing procedure (HNF-IP-0842). Implementing procedures should ensure the requirements of higher tier documents are satisfied.

- Effectiveness of the EH-22 Assessment Corrective Actions: Some corrective actions implemented in response to the EH-22 assessment have recently been closed (see Focused Review of the River Protection Project Safety Issues Corrective Action Plan, DOE/ORP-2001-23, Revision 1, March 2002). As such, it may be too early to fully assess the effectiveness of their implementation. However, in such cases, actions initiated prior to full

corrective action completion should be sufficiently effective to ensure acceptable ISMS implementation in the interim. The assessment of these areas can proceed from this perspective.

- ORP Implementation of ISMS: The scope of this assessment should focus on CHG implementation of ISMS, effectiveness of actions implemented by CHG in response to the EH-22 assessment, and on the effectiveness of ORP processes, mechanisms, and contractor interface activities that ensure effective implementation of ISM by CHG.

4.0 Assessment Plan

The Team Leader is to prepare an ISMS assessment plan for approval by the ORP Manager, confirm with the ORP point of contact that all ORP assigned team members are either qualified Facility Representatives and/or qualified assessors per ORP M 220.1, and confirm readiness to conduct the assessment. The following documents should be considered during development of the Assessment Plan:

- Integrated Environmental, Safety, and Health Management System Description for the Tank Farm Contractor, RPP-MP-003, Revision 4,
- ORP M 220.1, Revision 1, ORP Integrated Assessment Program,
- Office of ES&H Oversight Focused Review of the River Protection Project, July 2001,
- Letter from J. T. Conway, DNFSB (with enclosure), to J. H. Roberson, DOE-EM, dated October 2, 2001,
- Letter from J. H. Roberson, DOE-EM, to J. T. Conway, DNFSB, dated January 2, 2002, and
- CHG Contract DE-AC27-99RL14047, Section C (Statement of Work) and Section J, Appendix C (List of DOE Directives).

Additionally, the following recent reviews should also be considered during development of the Assessment Plan:

- Vital Safety System (VSS) Assessments: ORP recently completed a series of three Phase II assessments of Tank Farms VSSS in response to DNFSB Recommendation 2000-2. The assessment reports contain considerable information bearing on the condition of the CHG ISMS program.

- Special Report Order (SRO) Assessment: ORP recently completed a review of CHG actions taken in response to the EH-10 SRO. The SRO was an enforcement action initiated by EH-10 in October 2001, and the SRO assessment measured CHG progress in complying with the requirements of the SRO.

- ORP Facility Representative Review of Completed EH-22 Assessment Corrective Actions: An ORP Facility Representative completed a review (Surveillance Report S-02-OSO-TANKFARM-042) on July 16, 2002, of completed corrective actions by CHG as a result of the EH-22 assessment. The review confirmed that all corrective actions were complete, but it did not assess the effectiveness of the corrective actions.

5.0 Desired Deliverables from the Assessment

The Team should document results of the assessment in a report written in accordance with the guidance of Appendix 7 to DOE-HDBK-3027-99 and ORP M 220.1, "ORP Integrated Assessment Program." The report should describe any concerns, findings, or observations. Additionally, the report should state any recommended actions that the team considers necessary or desirable to ensure work is done safely.

6.0 Prerequisites for the ISMS Assessment

There are no readiness reviews or ISMS verifications required prior to completing this assessment. As noted previously, both Phase I and Phase II verifications were performed and the authorization agreements include an approved FSAR and TSR. Due to concerns regarding the effective implementation of ISMS during the spring of 2001 (EH-22 assessment), this assessment should focus on the effectiveness of CHG actions implemented to correct the previously identified deficiencies.

7.0 Estimated Date for Commencement

In accordance with the recent notification provided to CHG, the field work portion of this assessment will commence on September 9, 2002, and be complete by September 20, 2002 with the draft and final reports to be issued shortly thereafter. All preparatory activities, such as preparation of the assessment plan for ORP Manager approval, shall occur prior to September 9, 2002.

8.0 Points of Contact

The local points of contact for assisting in preparation activities, obtaining required documents and other information, and coordinating and scheduling meetings with the contractor are:

- DOE ORP: Stephen H. Pfaff, Facility Representative.
  (509) 373-7856 or (509) 544-8380 (cell)
  Stephen_H_Pfaff@rl.gov (email).

- CHG: John C. Fulton, Senior Vice President, Environmental, Safety, Health, and Quality.
  (509) 373-0531 or (509) 539-8443 (cell)
  John_Fulton@rl.gov (email)
  OR
  John W. Hobbs, Radiological Control Director
  (509) 372-8676 or (509) 531-1718 (cell)
  John_Hobbs@rl.gov (email)

AMSR:JHS
8/7/02

Review Plan
Criteria and Review Approach Document

Focused Review of CH2M Hill(CHG) Integrated Safety Management System (ISMS)

September 2002

Review Plan

Office of River Protection

T. Zack Smith
Team Leader

Approved: _____
Roy J. Schepens, Manager
Office of River Protection

Table of Contents

1.0 INTRODUCTION 2
2.0 FACILITY DESCRIPTION 3
3.0 CHG ISMS BACKGROUND AND HISTORY 4
4.0 OBJECTIVES AND SCOPE 4
5.0 APPROACH AND DELIVERABLES 6
6.0 SCHEDULE 8
7.0 TEAM MEMBERS 8
8.0 REFERENCES 8

Attachment A: Criteria and Review Approach Documents (CRADs)

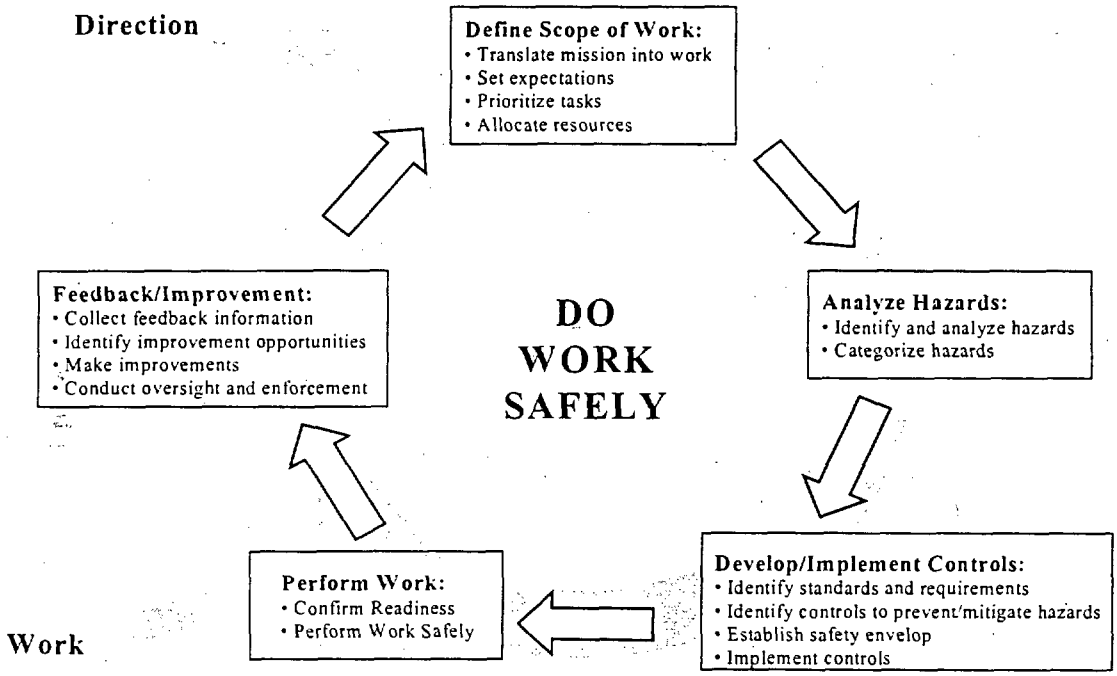
1.0 INTRODUCTION

A review of CH2MHILL Hanford Group, Inc. (CHG) Integrated Safety Management System (ISMS) implementation will be performed by the U. S. Department of Energy (DOE) from September 9 through September 20, 2002 (Refs. 1 and 2).

The review will involve a concentrated effort by a qualified and experienced team to evaluate CHG Integrated Safety Management (ISM) performance and DOE Office of River Protection (ORP) activities that ensure proper implementation. This review will be performed consistent with the requirements of DOE-HDBK-3027-99 (Ref. 6) for an ISMS verification. The review will focus on the effectiveness of feedback and continuous improvement, effectiveness of corrective actions implemented in response to the July 2001 EH-22 assessment (Ref. 4), and improvements in areas of noted concern in prior Defense Nuclear Facilities Safety Board (DNFSB) correspondence (Ref. 5).

The assessments conducted during this review will be based on the program and performance requirements for implementing the objectives, guiding principles, and core functions of Integrated Safety Management (ISM) as described in DOE Policy 450.4 (Ref. 7). The policy describes five core functions, which provide a structured approach to safely perform work with the rigor commensurate with hazards. These core functions are: define the scope of work; analyze the hazards; develop and implement hazards controls; perform work within controls; and provide feedback and continuous improvement (See Figure 1). The policy also identifies seven guiding principles that include: line management responsibility for safety; clear roles and responsibilities; balanced priorities; competence commensurate with responsibilities; identification of safety standards and requirements; hazards controls tailored to work being performed; and operations authorization.

Figure 1. Integrated Safety Management Core Functions



2.0 FACILITY DESCRIPTION

In accordance with Contract DE-AC27-99RL14047 (Ref. 8), CHG is responsible for the planning, management, and execution of Tank Farm projects, operations, and other activities. The Tank Farm Facility includes:

- 177 underground single shell (149) and double shell (28) tanks in the 200 East and West Hanford areas,
- Waste transfer systems,
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- 244-AR Vault,
- 242-T and 242-S Evaporators,
- Grout Facility, and
- Other miscellaneous equipment items, inactive storage facilities, waste storage pads, etc. as described in the Final Safety Analysis Report (FSAR) (HNF-SD-WM-SAR-067).

Per Contract DE-AC27-99RL14047, CHG is obligated to integrate safety and environmental awareness into all activities, including those of subcontractors at all levels consistent with Integrated Safety Management principles.

3.0 CHG ISMS BACKGROUND AND HISTORY

CHG has a mature ISMS. Both Phase I (October 1998) and Phase II (August 1999) verifications have been performed and ORP recently approved revision 4 of the ISMS Description (RPP-MP-003) (Ref. 9). Facilities and activities are covered by approved authorization agreements that include a FSAR and technical safety requirements (TSR) documents. Additionally, the FSAR is undergoing an update to meet the requirements of 10CFR830.207 by the April 10, 2003 deadline. A timeline of major ISMS implementation milestones for the Tank Farm Contractor is provided below:

- October 1998, ISMS Phase I Verification.
- May 1999, DOE-ORP Line Management Readiness Review.
- August 1999, ISMS Phase II Verification.
- June 2000, DOE-ORP declares ISM fully implemented at River Protection Project.
- April to July 2001, DOE ES&H Oversight Focused Review (EH-22 assessment).
- October 2001, Defense Nuclear Facilities Safety Board (DNFSB) Letter summarizing concerns with CHG implementation of ISM.
- April 2002, revision 1 of the corrective action plan developed in response to EH-22 assessment issued.
- June 2002, revision 4 of CHG ISMS Description issued.

4.0 OBJECTIVES AND SCOPE

The objectives of this review are to:

- Perform a focused ISMS verification to determine the effectiveness of CHG's actions to correct deficiencies in their ISM implementation, with emphasis on Core Function 5 – Feedback and Continuous Improvement, and
- Evaluate the effectiveness of DOE ORP processes, mechanisms, and contractor oversight activities that ensure proper implementation of the CHG ISMS.

Due to the number of corrective actions CHG has implemented in response to prior assessments, a focused ISMS assessment will be performed consistent with the guidance of DOE-HDBK-3027-99 for an ISMS verification. The results of this assessment will provide the ORP and CHG with a measure of the effectiveness of corrective actions CHG has implemented to improve its ISM Program and determine if ORP efforts are best focused on supporting effective implementation of ISM by CHG.

Results of the assessment will be structured around the five Core Functions of ISMS in a manner similar to the EH-22 assessment performed in Spring 2001. Team member qualifications, protocols, assessment plan, final report, and other aspects of this task are being prepared and implemented in accordance with the appropriate guidance of DOE-HDBK-3027-99 and ORP M 220.1 (Ref. 11). Criteria and Review Approach Documents (CRADs) have been prepared (see Attachment A) using some of the same objectives and criteria as those established within DOE-HDBK-3027-99 for an ISMS verification. The

review approach established within each CRAD have been tailored to specific focus areas based on special considerations for the assessment and results of recent assessments (see below for details). The Review Plan, with CRADs attached will be submitted for ORP Manager review and approval prior to commencement of the field work portion of the assessment.

Special Considerations for Assessment

- Requirements Basis: DOE directives, Department of Energy Acquisition Regulation clauses, and other applicable requirements are listed in and invoked through CHG Contract DE-AC27-99RL14047. How CHG implements these requirements is further defined by the Authorization Basis, Standards/Requirements Identification Documents, CHG ISMS Description for each core function (Revision 4), and CHG administrative implementing procedures. Implementing procedures should ensure the requirements of higher tier documents are satisfied.

- Effectiveness of the EH-22 Assessment Corrective Actions: Some corrective actions implemented in response to the EH-22 assessment (Ref. 3) have recently been closed. As such, it may be too early to fully assess the effectiveness of their implementation. However, in such cases actions initiated prior to full corrective action completion should be sufficiently effective to ensure acceptable ISMS implementation in the interim. The assessment of these areas can proceed from this perspective.

- Defense Nuclear Facilities Safety Board (DNFSB) Concerns: In letter from J. T. Conway, DNFSB, to J. H. Roberson, DOE HQ, concerns were expressed regarding weaknesses in the CHG ISMS. The DNFSB expressed concerns with problems in the implementation of the CHG feedback and continuous improvement process and the magnitude of completed and planned modifications to the ISMS, indicating a focused verification review of the revised program may be warranted. These areas of concern will be evaluated as part of this assessment.

Additional documents considered in the development of this assessment plan and the CRADs are listed in Section 5.0.

5.0 APPROACH AND DELIVERABLES

In addition to notifying CHG of the review schedule and scope and appointing the Team Lead, other major elements of the assessment, consistent with the guidance of DOE-HDBK-3027-99 and ORP M 220.1, include:

- Preparation of the Assessment Plan and CRADs,
- Selection of Assessment Team,
- Pre-Visit Activities,
- Field Work Activities, and
- Development of the Final Report.

Development of the Review Plan and CRADs:

This Review Plan has been prepared for ORP Manager review and approval. In addition to the objectives and scope, the following documents were considered during the development of the Review Plan:

- Integrated Environmental, Safety, and Health Management System Description for the Tank Farm Contractor, RPP-MP-003, Revision 4,
- ORP M 220.1, Revision 1, ORP Integrated Assessment Program (Ref. 11),
- Office of ES&H Oversight Focused Review of the River Protection Project, July 2001,
- Letter from J. T. Conway, DNFSB (with enclosure), to J. H. Roberson, DOE-EM, dated October 2, 2001,
- Letter from J. H. Roberson, DOE-EM, to J. T. Conway, DNFSB, dated January 2, 2002 (Ref. 12), and
- CHG Contract DE-AC27-99RL14047, Section C (Statement of Work) and Section J, Appendix C (List of DOE Directives).

In addition to Special Considerations for the Review, the following recent reviews were considered during development of the CRADs (and will be further used during the assessment):

- Vital Safety System (VSS) Assessments: ORP recently completed a series of three phase II assessments of Tank Farms vital safety systems in response to DNFSB recommendations 2000-2. The assessment reports contain information regarding the condition of the CHG ISMS program.

- Special Report Order (SRO) Assessment: ORP recently completed a review of CHG actions taken in response to the EH-10 SRO. The SRO was an enforcement action initiated by EH-10 in October 2001, and the SRO assessment measured CHG progress in complying with the requirements of the SRO.

Selection of Assessment Team:

Team members were selected based on a number of criteria and are listed in Section 7.0, including:

- Prior ISMS experience,
- Prior assessment experience,
- Knowledge of and experience with CHG and/or similar contracted operations at other DOE sites, and
- ORP management and Team Lead recommendations.

Biographies summarizing capabilities and experience of each assessor will be included in the final report.

Pre-Visit Activities:

A pre-visit, three to four weeks prior to the fieldwork, was performed to:

- Meet with CHG to obtain their perspective on performance in each area to be assessed,
- Finalize the CRADs and assessment plan,
- Identify CHG interview candidates and routine tank farm activities to observe during the field work portion of the assessment,
- Determine which team members will support the various CRAD lines of inquiry, and
- Perform some preliminary document reviews.

Field Work Activities:

Fieldwork activities will begin in September for an approximate two-week period. The team will convene at the Tank Farms to observe field activities, interview select CHG personnel, and review documents. Some fieldwork may be done after the pre-visit but prior to the September 9th start date in order to maximize observation opportunities and to minimize tank farm schedule disruptions.

The team will hold an entrance meeting with CHG management. During the period of onsite work, the team will hold daily meetings to review and discuss observations from the day's activities and identify areas requiring follow up. Additionally, the Team Leader will provide daily status briefings to a senior CHG management representative on the team's activities, observations, and emerging issues. Both strengths and weaknesses will be noted. If program or performance weaknesses are identified, the team will identify potential opportunities or areas for improvement. Potential issues and weaknesses will be verified and validated with CHG staff and management as they are identified throughout the course of the assessment. A formal exit briefing will be performed.

Development of the Final Report:

Assessment results will be documented by the team in accordance with the guidance of Appendix 7 to DOE-HDBK-3027-99 and ORP M 220.1. The report will describe any concerns, findings, or observations. Additionally, the report will state any actions that the team considers necessary or desirable to ensure work is done safely.

6.0 SCHEDULE

In accordance with the recent notification provided to CHG, the fieldwork portion of this assessment will commence on September 9, 2002 and be complete by September 20, 2002 - with the draft and final reports to be issued shortly thereafter. All preparatory activities, such as approval of this Review Plan by the ORP Manager, shall occur prior to September 9, 2002.

7.0 TEAM MEMBERS

An experienced and capable team has been assembled to complete this assessment. Individual biographies will be included in the Final Report. The team includes some personnel from outside ORP who have no prior involvement assessing CHG or reviewing CHG/ORP corrective actions. These personnel will provide external perspective on the effectiveness of both corrective actions and overall ISMS performance.

Team Leader:	T. Zack Smith, DOE, Savannah River Operations Office
Senior Advisor:	Tom Pestorius, H&P, Inc.
Administrative:	Lynda C. Autry, DOE, Savannah River Operations Office
Team:	Dave H. Brown, DOE, ORP J. J. Hynes, DOE, Savannah River Operations Office Terry E. Krietz, DOE, Headquarters (EM-5) Stephen H. Pfaff, DOE, ORP Linda M. Quarles, DOE Savannah River Operations Office David E. Sexton, GTI

8.0 REFERENCES

1. ORP memorandum from R. J. Schepens to T. Z. Smith, SR, "Appointment as Team Lead for CH2M HILL Hanford Group, Inc. (CHG) September 2002 Integrated Safety Management System (ISMS) Assessment," 02-AMSR-023, dated August 9, 2002.

2. ORP letter from R. J. Schepens to E. S. Aromi, CH2M HILL Hanford Group, Inc., "Contract No. DE-AC27-99RL14047 – Schedule and Scope Change of the Integrated Assessment," 02-ORP-067, dated July 26, 2002.

3. "Focused Review of the River Protection Project Safety Issues Corrective Action Plan," DOE/ORP-2001-23, Revision 1, March 2002.

4. Office of ES&H Oversight Focused Review of the River Protection Project, July 2001.

5. DNFSB letter from J. T. Conway to J. H. Roberson, HQ, dated October 2, 2001.

6. DOE Handbook, "Integrated Safety Management System (ISMS) Verification, Team Leader's Handbook," DOE-HDBK-3027-99, June 1999.

7. DOE P 450.4, "Safety Management System Policy," 10-15-96.

8. CHG Contract DE-AC27-99RL14047, Section C (Statement of Work) and Section J, Appendix C (List of DOE Directives).

9. Integrated Environmental, Safety, and Health Management System Description for the Tank Farm Contractor, RPP-MP-003, Revision 4.

10. 10 CFR 830.207, DOE approval of safety basis.

11. ORP M 220.1, Revision 1, ORP Integrated Assessment Program.

12. Letter from J. H. Roberson, DOE-EM, to J. T. Conway, DNFSB, dated January 2, 2002.

Attachment A

Criteria and Review Approach Documents (CRADs)

Objective: DOE.1 ORP procedures and mechanisms should ensure that work is formally and appropriately authorized and performed safely. ORP line management should be involved in the review of safety issues and concerns and should have an active role in authorizing and approving work and operations. (Appendix 3, DOE.1, DOE-HDBK-3027-99)

A. Criteria

1. ORP procedures and/or mechanisms are in place that establish a process for confirming readiness and authorizing operations. (Appendix 3, DOE.1, DOE-HDBK-3027-99)

2. ORP procedures and/or mechanisms ensure that the safety management system is properly implemented and line management oversight of the contractor's worker, public, environment, and facility protection programs is performed. (Appendix 3, DOE.1, DOE-HDBK-3027-99)

3. ORP procedures and/or mechanisms require day-to-day operational oversight of contractor activities through Facility Representatives. (Appendix 3, DOE.1, DOE-HDBK-3027-99)

4. ORP procedures and/or mechanisms ensure the implementation of quality assurance programs and ensure that contractors implement quality assurance programs. (Appendix 3, DOE.1, DOE-HDBK-3027-99)

B. Approach

Document Reviews:

1. Review recent ORP reports, such as quarterly assessment reports completed by the line organization regarding TFC performance. Verify ORP assessment activities are focused and prioritized to ensure the safety of the public, environment, workers, and the facility. Verify that assessment activities are balanced and place greatest emphasis on the most important aspects of operational safety such as authorization basis application. As necessary, verify issues are raised to appropriate ORP Subject Matter Experts (e.g., Authorization Basis Engineering, Safety and Health, etc.) for resolution and evaluation for site wide applicability. Review recently approved occurrence reports and verify that ORP only approves reports with appropriate evaluation of events, identification of root cause and appropriate corrective actions. Evaluate contractor responses to ORP assessment activities and determine if the feedback process is improving the safety of operations.

2. As available, review completed ORP readiness reviews, restart assessments, and/or startup assessments of Tank Farm Contractor (TFC) operational activities for effectiveness in evaluating contractor readiness for operations.

Observations:

1. Observe key routine TFC, TFC/ORP, and ORP meetings (e.g., daily Facility Representatives phone call) for meeting content, action assignment, and issue resolution.

2. Observe select Facility Representative and ORP oversight activities for fulfillment of assigned oversight responsibilities.

Interviews:

1. Interview some Facility Representatives and ORP program owners to confirm: clear understanding of: oversight responsibilities, work activities requiring DOE authorization, processes for implementing responsibilities, importance of work safety as part of work authorization, availability/use of TFC performance data to focus oversight efforts, and TFC responsiveness to ORP identified issues/concerns.

2. Interview some TFC management personnel to confirm there is a clear understanding of when DOE work authorization is required and obtain feedback on the quality (value) of ORP oversight in assisting the TFC in the identification of ISMS implementation issues. Determine if oversight is adequate or excessive.

3. Interview ORP line management to confirm that line management is responsible for safety and is cognizant of day-to-day activities, issues, and issue resolution.

Objective: DOE.2 ORP procedures and mechanisms ensure that hazards are analyzed, controls are developed, and that feedback and improvement programs are in place and effective. DOE line managers are using these processes effectively, consistent with FRAM (ORP 411.1-1, R1) requirements. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

A. Criteria

1. ORP procedures and/or mechanisms are in place to ensure that the TFC's hazard analysis covers the hazards associated with the work and is sufficient for selecting standards. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

2. ORP procedures and/or mechanisms are in place in which ORP directs the TFC to propose facility or activity-specific standards tailored to the work and the hazards. ORP procedures require that appropriate safety requirements in necessary functional areas are included in the contract. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

3. ORP procedures and/or mechanisms are in place that direct DOE line manager oversight to ensure that implementation of hazards mitigation programs and controls are established. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

4. ORP procedures and/or mechanisms are in place that direct the preparation of the authorization basis documentation and oversee the implementation by the TFC. Procedures for development, review, approval, maintenance, and utilization of Authorization Agreements are implemented. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

5. ORP procedures and/or mechanisms require that contractors develop a lessons-learned program and monitor its implementation. A process is established for reviewing occurrence reports and approving proposed corrective action reports. An ORP process is established and effectively implemented to continuously improve efficiency and quality of operations. Corrective actions are developed, implemented, and tracked in order to profit from prior experience and the lessons learned. ORP provides effective line oversight of the TFC's self-assessment programs. (Appendix 3, DOE.2, DOE-HDBK-3027-99)

B. Approach

NOTE: The procedures and mechanisms described above (e.g., CHG Contract, Authorization Basis Documents, Standards/Requirements Identification Documents, CHG ISMS Description, ORP controlling directives) were previously established. Therefore, this assessment will focus on the results from using these procedures and mechanisms through a sampling review of the end products (e.g., FSAR changes).

Document Reviews:

1. Obtain sample of recent FSAR and TSR submittals to ORP for review and ORP responses for adequacy. Confirm the appropriate criteria (thresholds) have been established within ORP and Tank Farm Contractor (TFC) procedures for when ORP reviews and approvals are required. Confirm ORP utilizes an integrated approach to review and approve Authorization Basis changes, such as appropriate SME's, program personnel, and Facility Representatives.
2. Review a sampling of DEAR Clause flowdowns for subcontractor work. Review a contract for a subcontractor (inclusive of Special Provision 5) to ensure appropriate safety requirements are specified to safely perform work.
3. Confirm the effectiveness and efficiency of ORP's process for review and approval of TSR changes. Evaluate the adequacy of ORP oversight of the contractor's USQ process.

Observations:

1. If occurring during the assessment period, attend and observe meetings on authorization basis changes between ORP and the TFC.

Interviews:

1. Interview personnel responsible for review of authorization basis changes, lessons learned, and operations information. Confirm their understanding of the processes, solicit their input on TFC performance in this area, and gather any data on planned or in progress actions to improve performance in these areas as needed.

Objective: HAZ.1 The full spectrum of hazards associated with the Scope of Work is identified, analyzed, and categorized. Those individuals responsible for the analysis of the environmental, health and safety, and worker protection hazards are integrated with personnel assigned to analyze the processes. (Appendix 3, HAZ.1, DOE-HDBK-3027-99)

A. Criteria

1. Procedures and/or mechanisms are in place and utilized by personnel to ensure hazards associated with the work throughout the facility have been identified and analyzed. The resulting documentation is defined, complete, and meets DOE expectations. The execution of these mechanisms ensure that personnel responsible for the analysis of environmental, health and safety concerns are integrated with those assigned to analyze the hazards for the facility or activity. These mechanisms ensure direction and approval from line management and integration of the requirements.

2. Procedures and/or mechanisms are in place and utilized by personnel that describe the interfaces, roles and responsibilities of those personnel who identify and analyze the hazards of the scope of work. Personnel assigned to accomplish those roles are competent to execute those responsibilities.

B. Approach

Document Reviews:

1. Review a sample of facility documents and document changes, such as engineering change notices, administrative manual changes, and drawings with emphasis on recent projects and/or modifications. Determine if the various sources of change that could result in the need for a safety evaluation have been identified and screened or evaluated through the USQ process.

2. Review a sample of completed hazard identification and analysis documents such as job hazard analyses, TSR changes to determine the adequacy of the hazard analysis and technical review.

3. Review qualification and training records for a sample of personnel involved in work planning and hazards identification. Verify that they are appropriately trained and qualified for their tasks.

Observations:

1. Observe the performance of a USQ screening and if possible, a USQ determination to verify how effectively contractor personnel can evaluate potential new hazards against the analyzed set of hazards in the safety basis.

2. Observe development of job hazard analysis documentation during enhanced work planning sessions, and use of the hazard review module tool for work planners as well as any other mechanisms to incorporate appropriate work and technical safety requirement (TSR) controls into the work packages.

Interviews:

1. Interview technical support, work planning, and operations staff responsible for the preparation, review and approval of hazard identification and analysis documents. Determine level of knowledge of personnel involved in hazard analysis and technical reviews. Assess AB knowledge of work planners.

Objective: HAZ.2 An integrated process has been established and is utilized to develop controls that mitigate the identified hazards present within a facility or activity. The set of controls ensure adequate protection of the public, worker, and the environment and are established as agreed upon by DOE. These mechanisms demonstrate integration, which merge together at the workplace. (Appendix 3, HAZ.2, DOE-HDBK-3027-99)

A. Criteria

Procedures and/or mechanisms are in place to develop, review, approve and maintain current all elements of the facility Authorization Basis Documentation with an integrated workforce.

1. Procedures and/or mechanisms that identify and implement appropriate controls for hazards mitigation within the facility or activity are developed and utilized by workers and approved by line managers. These procedures/mechanisms reflect the set of safety requirements agreed to by DOE.

2. Standards and requirements are appropriately tailored to the hazards.

3. Procedures and/or mechanisms are in place to develop, maintain, and utilize Authorization Agreements.

4. Procedures and/or mechanisms are in place to effectively and accurately implement all aspects of the Authorization Basis.

B. Approach

Document Reviews:

1. Review a sample of hazard control documents such as authorization agreements, the final safety analysis report, technical safety requirements, work packages, radiation work permits, and operating procedures. Verify safety controls are provided for the hazards identified and that the control strategy encompasses a hierarchy of 1) hazard elimination, 2) engineering controls, 3) administrative controls, and 4) personnel protective equipment. Hazards addressed should include radiological control, industrial hygiene, and industrial safety issues.

2. Review a sample of work documents prepared using the Hazardous Review Module. Verify that they appropriately identify hazards and specify meaningful controls. Verify that the controls are correctly integrated into the work package.

3. Review contractor procedures and mechanisms in place to ensure accurate and effective implementation of authorization basis requirements in the work planning process.

Observations:

1. Verify effective implementation of a sample of recent authorization basis changes.

2. Observe any activities such as worker training and procedure modification conducted with the purpose of implementing an authorization basis change. Verify that material and presentations are technically accurate and effectively implement the change.

3. Observe implementation of hazard controls derived from a sample of routine work documents such as lockout/tagout authorization forms, confined space entry permits, energized work permits, radiological work permits, and job hazard analyses. Verify that these are executed properly and they effectively protect workers, the public, and the environment from the hazard.

Interviews:

Interview technical support, facility management and operations personnel responsible for the development of hazard controls to evaluate integration of development, review, approval and implementation.

Interview a sample of personnel who have used the new Hazardous Review Module. Determine that any weaknesses in the new process have been identified for correction.

Objective: MG.1 An integrated process has been established and is utilized to identify and prioritize specific mission discrete tasks, mission process operations, modifications and work items. (Appendix 3, MG.1, DOE-HDBK-3027-99)

A. Criteria

1. CHG procedures and/or mechanisms that require line management to identify and prioritize mission-related tasks and processes, modifications, and work items are in place and utilized by personnel. (Appendix 3, MG.1, DOE-HDBK-3027-99)

2. CHG procedures and/or mechanisms are in place and utilized by personnel that define the roles and responsibilities for the identification and prioritization of mission-related tasks and processes, facility or process modifications, and other related work items. Personnel assigned to the roles are competent to execute these responsibilities. (Appendix 3, MG.1, DOE-HDBK-3027-99)

3. CHG procedures and/or mechanisms are in place and utilized by personnel that ensure identified work (i.e., mission-related tasks and processes, facility or process modification, maintenance work, etc.) can be accomplished within the standards and requirements identified for the facility. (Appendix 3, MG.1, DOE-HDBK-3027-99)

B. Approach

Document Reviews:

1. Review the CHG Systems Engineering Management Plan, monthly progress reports, and performance indicators (such as work age, and backlog). Review procedure requirements for prioritization of maintenance work requests, projects, and modifications. Review outstanding work requests and planned modifications. Verify work activities and projects are appropriately prioritized.

Observations:

1. Attend long range planning and work planning/scheduling meetings, both CHG and CHG/ORP, to confirm appropriate consideration of Mission requirements and the integrated baseline in the prioritization and planning of work activities.

Interviews:

1. Interview personnel responsible for the planning and prioritization of work and interview personnel responsible for equipment and tank farm operational performance. Confirm work critical to Mission objectives and tank farm operational performance are receiving appropriate priority and that a formal process exists for identifying, evaluating, and scheduling work critical to Mission Requirements.

Objective: MG.2 Clear and unambiguous roles and responsibilities are defined and maintained at all levels within the facility or activity. Managers at all levels demonstrate a commitment to ISMS through policies, procedures, and their participation in the process. Facility or activity line managers are responsible and accountable for safety. Facility or activity personnel are competent commensurate with their responsibility for safety. (Appendix 3, MG.2, DOE-HDBK-3027-99)

A. Criteria

1. CHG procedures and/or mechanisms are in place that define clear roles and responsibilities within the facility or activity to ensure that safety is maintained at all levels. (Appendix 3, MG.2, DOE-HDBK-3027-99)

2. Facility or activity procedures specific that line management is responsible for safety. (Appendix 3, MG.2, DOE-HDBK-3027-99)

3. CHG procedures and/or mechanisms are in place that ensure that personnel who supervise work have competence commensurate with their responsibilities. (Appendix 3, MG.2, DOE-HDBK-3027-99)

4. CHG procedures and/or mechanisms are in place that ensure that personnel performing work are competent to safely perform their work assignments. (Appendix 3, MG.2, DOE-HDBK-3027-99)

B. Approach

Document Reviews:

1. Review the effectiveness of CHG actions taken in response to the EH-22 assessment on training and qualifications. Specifically, review operations proficiency requirements and the industrial hygiene technician program for adequacy of proficiency/training requirements against job responsibilities. (NOTE: field observations of Operator proficiency will be completed as part of the OP.1).

2. Review recent safety events (e.g., work on energized equipment) to assess management actions taken to evaluate, resolve, and prevent future events.

3. Review existing requirements for authorization basis training and adequacy of training content in support of CHG operations, work planning, and Engineering roles. Review recent CHG operating experience for events that may have resulted from insufficient Operator, Industrial Hygienist, or Authorization Basis training and resulting corrective actions.

Observations:

1. Attend a CHG safety meeting to observe meeting content including discussion of responsibilities for safety. Confirm ISMS tailgate session materials are used (available on the LAN). Review any trends/repeat safety issues and determine if these issues are being addressed at standing safety meetings.

NOTE: Observations of Operator proficiency, knowledge/application of Authorization Basis by CHG personnel, and knowledge of applicable safety hazards. will be reviewed as part of the HAZ CRADs.

Interviews:

1. Interview senior line management responsible for integrating field work activities and select ESH&Q personnel and Field Work Supervisors. Assess their understanding of any recent safety events and actions taken to prevent recurrence (both for CHG and any sub-contractors working for CHG).

Objective: MG.3 An integrated process has been established that ensures mechanisms are in place to ensure continuous improvements are implemented through an assessment and feedback process, which functions at each level of work and at every stage in the work process. (Appendix 3, MG.3, DOE-HDBK-3027-99)

A. Criteria

1. CHG procedures and/or mechanisms are in place and utilized by personnel to collect feedback information such as self assessment, monitoring against performance objectives, occurrence reporting, and routine observation. Personnel assigned these roles are competent to execute these responsibilities. (Appendix 3, MG.3, DOE-HDBK-3027-99)

2. CHG procedures are in place that develop feedback and improvement information opportunities at the site and facility levels as well as the individual maintenance or activity level. The information that is developed at the individual maintenance or activity level is utilized to provide feedback and improvement during future similar or related activities. (Appendix 3, MG.3, DOE-HDBK-3027-99)

3. CHG procedures and/or mechanisms are in place and utilized by managers to identify improvement opportunities. Evaluation and analysis mechanisms should include processes for translating operational information into improvement processes and appropriate lessons learned. (Appendix 3, MG.3, DOE-HDBK-3027-99)

4. CHG procedures and/or mechanisms are in place and utilized by managers to consider and resolve recommendations for improvement, including worker suggestions. (Appendix 3, MG.3, DOE-HDBK-3027-99)

5. CHG procedures and/or mechanisms are in place, which include a process for oversight that ensures that regulatory compliance is maintained. (Appendix 3, MG.3, DOE-HDBK-3027-99)

B. Approach

Document Reviews:

1. Select a sample of recent CHG Problem Evaluation Reports (PERs) and the associated evaluations and corrective actions. Review documentation and confirm:
   - Problems are screened promptly for their effect on safety, reliability, operability, and reportability,
   - Problems are evaluated in a timely fashion commensurate with their significance to determine cause,

- Until significant problems are evaluated, interim corrective actions are established to prevent recurrence,
- Evaluations review problems for root cause, contributing cause, extent of condition and corrective actions to prevent recurrence,
- Corrective actions are approved, prioritized, tracked, and completed in a timely manner commensurate with their significance,
- Problems are trended to identify repeat occurrences, generic issues, and lower-level issues to evaluate and correct the condition prior to a significant problem, and
- Corrective actions are effective in preventing recurrence and, for significant problems, are checked for effectiveness.

Additionally, review established process indicators for overall program performance and determine if indicators are accurate, meaningful and useful in affecting program improvements.

2. Select a sample of recently prepared CHG lessons learned evaluations. Review adequacy of evaluation, identification of corrective actions, and confirm actions are tracked to closure. Confirm lessons learned information is incorporated into maintenance work requests.

3. Review a sample of recently completed CHG independent assessments, senior management organized management assessments, management observations, and Senior Safety Review Board (SSRB) meeting minutes. Verify that assessments and proposed corrective actions are useful. Confirm actions are managed to completion.

4. Review the effectiveness of CHG actions taken in response to the EH-22 assessment, on feedback and improvement processes.

Observations:

1. Attend key meetings of the CHG PER Process (e.g., issue screening and classification, Corrective Action Review Board, etc.) to verify issues are properly ranked, assigned, evaluated, and managed to closure.

2. Attend a CHG management observation or senior management organized management assessment activity to verify observations are effective in identifying, correcting, and providing feedback in areas that require improvement.

Interviews:

1. Interview personnel responsible for implementation of the Lessons Learned Program to evaluate their knowledge and understanding of the program and effectiveness of program implementation (including timeliness of reviews and development/implementation of any required corrective actions).

2. Interview personnel responsible for the PER process to evaluate their knowledge and understanding of the program and effectiveness of process implementation (e.g., timeliness and quality of evaluations, number of repeat occurrences, performance trends, etc.). Contact some personnel who have written PERs to obtain their insights on obtaining feedback on issues they identified.

3. Interview Field Work Supervisors to determine the quality, use, effectiveness of post-job critiques and availability/use of lessons learned information in pre-job briefs.

Objective: OP.1 An integrated process has been established and is utilized to effectively plan, authorize and execute the identified work for the facility or activity. (Appendix 3, OP.1, DOE-HDBK-3027-99)

A. Criteria

1. Procedures and/or mechanisms are in place to ensure that work planning is integrated at the individual maintenance or activity level, fully analyzes hazards, and develops appropriate controls.

2. Procedures and/or mechanisms are in place which ensure that there is a process used to confirm that the facility or activity and the operational work force are in an adequate state of readiness prior to authorizing the performance of the work.

3. Procedures and/or mechanisms are in place which ensure that there is a process used to gain authorization to conduct operations.

4. Procedures and/or mechanisms are in place which ensure that safety requirements are integrated into work performance.

5. Procedures and/or mechanisms are in place which ensure that adequate performance measures and indicators, including safety performance measures are established for the work.

6. Workers actively participate in the work planning process.

7. Procedures and/or mechanisms demonstrate effective integration of safety management.

B. Approach

Document Reviews:

1. Review contractor administrative procedures for work planning and work control – both for prime contractor work and for sub-contractor construction projects – to verify procedure adequacy against the above assessment criteria.

2. Review a sample of in-progress and completed work packages and verify compliance with contractor procedures and worker training requirements. Also verify proper completion of required work documentation with emphasis on information provided to improve safety and work performance as well as to demonstrate operability of safety class and safety significant systems.

3. Review post-job reviews, critiques, occurrence reports, event investigation reports, contractor trend analysis results and subsequent corrective actions to determine if the feedback process is effective.

4. From a list of PERs describing work stoppages due to work package problems or employee stop-work actions, review a sample of the applicable work packages to verify use of post-job reviews and development of corrective actions.

Observations:

1. Observe work planners' development of work packages to determine if the necessary information from job hazard analyses, technical safety requirement (TSR) controls, lessons learned, post-job reviews, ALARA management worksheets and any other tools or mechanisms are included in the work package in an understandable manner.

2. Observe shift operations review of work packages, review of lockout/tagouts and other types of work permits, review of facility readiness to perform work, consideration of TSR controls, and authorization of the work to determine if contractor operations management maintains satisfactory control of facility configuration, conduct of operations, and worker safety.

3. Observe a sample of pre-job safety briefings to verify supervisors ensure worker training requirements are met, and that supervisors and workers possess sufficient understanding of safety precautions, procedure steps, important prerequisites and plant conditions, hold points, related TSR controls, and response to abnormal and emergency conditions.

4. Observe field performance of routine and non-routine work to determine contractor and subcontractor adherence to safety precautions, applicable TSR controls, and work steps.

5. Observe operations evolutions and verify operators demonstrate proficiency in the performance of tasks for which they are specifically qualified to perform.

6. Observe performance of management oversight of work in the tank farms including any follow-on activities to report and resolve issues to determine effectiveness of line management oversight.

Interviews:

1. Interview work planners to evaluate understanding of facility hazards and appropriate work controls including TSR controls. Also evaluate their integration with safety subject matter experts.

2. Interview work supervisors and workers when possible prior to, during, or after performance of work activities to verify participation in work planning, and understanding of job hazards and controls, work control requirements, and specific work instructions for their given tasks.