

**Independent Oversight  
Inspection of Environment,  
Safety, and Health Programs at the**



# **East Tennessee Technology Park**

**November 2008**

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Office of Environment, Safety and Health Evaluations  
Office of Independent Oversight  
Office of Health, Safety and Security  
Office of the Secretary of Energy



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## Abbreviations Used in This Report

|                 |  |
|-----------------|--|
| <b>AMEM</b>     | <i>Office of the Assistant Manager for Environmental Management (Oak Ridge Office)</i> |
| <b>ARAR</b>     | <i>Applicable or Relevant and Appropriate Requirements</i>                             |
| <b>BJC</b>      | <i>Bechtel Jacobs Company, LLC</i>   |
| <b>CFR</b>      | <i>Code of Federal Regulations</i>   |
| <b>D&amp;D</b>  | <i>Decontamination and Decommissioning</i>   |
| <b>DOE</b>      | <i>U.S. Department of Energy</i>   |
| <b>EM</b>       | <i>Environmental Management (Headquarters)</i>   |
| <b>ES&amp;H</b> | <i>Environment, Safety, and Health</i>   |
| <b>ETTP</b>     | <i>East Tennessee Technology Park</i>  |
| <b>HSS</b>      | <i>Office of Health, Safety and Security</i>   |
| <b>ISM</b>      | <i>Integrated Safety Management</i>  |
| <b>ORO</b>      | <i>Oak Ridge Office</i>  |
| <b>PPE</b>      | <i>Personal Protective Equipment</i>   |
| <b>RWP</b>      | <i>Radiological Work Permit</i>  |
| <b>SAC</b>      | <i>Specific Administrative Control</i>   |
| <b>TSR</b>      | <i>Technical Safety Requirements</i>   |

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# 1 Introduction

The U.S. Department of Energy (DOE) Office of Independent Oversight, within the Office of Health, Safety and Security (HSS), inspected environment, safety, and health (ES&H) programs at the DOE East Tennessee Technology Park (ETTP) during August through September 2008. HSS reports directly to the Office of the Secretary of Energy, and the ES&H inspection was performed by Independent Oversight's Office of Environment, Safety and Health Evaluations. The inspection was performed concurrently with an inspection of emergency management at the Oak Ridge National Laboratory, performed by Independent Oversight's Office of Emergency Management Oversight, and an inspection of nuclear safety at Oak Ridge National Laboratory, performed by the Office of Environment, Safety and Health Evaluations.

At DOE Headquarters, the DOE Office of Science is the landlord for the Oak Ridge Reservation. The Office of Environmental Management (EM) has primary line management responsibility for the closure project at ETTP. As such, EM has overall Headquarters responsibility for programmatic direction, funding of activities, and ES&H at the site. At the site level, line management responsibility for the Oak Ridge Reservation (which includes ETTP and several other DOE sites) falls under the Manager of the Oak Ridge Office (ORO). Within ORO, the Office of the Assistant Manager for Environmental Management (AMEM) is responsible for ETTP. Site decontamination and decommissioning (D&D) activities at ETTP are managed by Bechtel Jacobs Company, LLC (BJC) under contract to DOE.

The current missions of the ETTP site include managing radioactive wastes, maintaining facilities pending their disposition, characterizing hazardous materials and conditions, and performing D&D of facilities and environmental cleanup and restoration for the eventual site transition to public use. In addition, selected facilities at ETTP are currently leased or have been transferred to private-sector companies as part of the site reindustrialization effort.



Aerial View of ETTP

ETTP activities involve various potential hazards that need to be effectively controlled, including exposure to external radiation, radiological contamination, hazardous chemicals, and various physical hazards associated with facility operations (e.g., machine operations, high-voltage electrical equipment, hoisting and rigging heavy loads, and noise). Radiological materials and hazardous chemicals are present in various forms at ETTP.

The purpose of this Independent Oversight inspection was to assess the effectiveness of ES&H programs at ETTP as implemented by BJC under the direction of ORO and EM. Independent Oversight evaluated a sample of activities at ETTP, including:

- Implementation of the core functions of integrated safety management (ISM) for selected activities at the K-25/K-27 D&D project (which covers D&D of these buildings) and the ETTP site D&D project (which covers a variety of other sitewide D&D efforts), focusing on work planning and control systems at the activity and facility levels.
- ORO's and ETTP's effectiveness in managing and implementing selected aspects of the ES&H program that Independent Oversight has identified as focus areas, including hazardous waste management and specific administrative controls (SACs) for nuclear facilities. Although these topics are not individually rated, the results of focus-area reviews are integrated with or considered in the evaluation of other ISM elements. In examining these areas, Independent Oversight focused primarily on the application of institutional programs to ETTP at the activity and facility levels.
- ORO's and ETTP's feedback and continuous improvement systems. The review of feedback and improvement systems also constitutes the Independent Oversight evaluation of the effectiveness of ORO and ETTP's implementation of DOE Order 226.1A, *Implementation of DOE Oversight Policy*, which is a long-term Independent Oversight focus area.

Sections 2 and 3 discuss the key positive attributes and weaknesses, respectively, identified during this inspection. Section 4 presents a summary assessment of the effectiveness of the major ISM elements that were reviewed. Section 5 provides Independent Oversight's conclusions regarding the overall effectiveness of ORO's and BJC's management of ES&H programs, and Section 6 presents the ratings assigned during this inspection. Appendix A provides supplemental information, including team composition.

Appendix B presents the findings identified during this Independent Oversight inspection. The findings are also referenced in the applicable portions of Sections 3 and 4 of this report. In most cases, the findings listed in Appendix B were derived from multiple individual deficiencies that are described in the detailed results provided to the site in a separate document.

In accordance with DOE Order 470.2B, *Independent Oversight and Performance Assurance Program*, EM must develop a corrective action plan to address each of the findings identified in Appendix B, including the associated individual deficiencies, and provide appropriate causal analyses, corrective actions, and recurrence controls for each finding. The weaknesses in Section 3 provide a management-level summary of the findings; these weaknesses do not need to be addressed separately in the EM corrective action plan because the findings encompass the scope of the weaknesses.

# 2

## Positive Attributes

Positive attributes were identified in several ES&H programs, particularly in certain aspects of worker safety programs and controls for offsite waste shipments.

**Programmatic controls in the areas of fall protection, respiratory protection, and heat stress monitoring at the K-25/K-27 D&D project are notably robust and effective.** Fall protection is particularly important at ETTP because of facility conditions, such as aging and deteriorating structures and the extensive and complex D&D activities that are occurring. Thus, BJC has devoted particular attention to fall protection, and the systems and requirements at K-25/K-27 are particularly rigorous. A specially designed and engineered fall arrest system was installed to provide lifelines and suitable tie off points, and there is extensive use of fall protection whenever workers are required to work at heights greater than six feet. Respiratory protection is used extensively for many work activities at K-25/K-27, and BJC applies a conservative approach to issuance and use of respirators. Respirators and cartridges are single use only, with cartridges being disposed and masks being sent to a cleaning facility for inspection, cleaning, and repackaging in a sealed bag. In addition to full face respirators for specific work, a minimum requirement for any entry into the K-25/K-27 building is a disposable filtering face piece that is required because of potential mold concerns. BJC implements a unique fit testing program that includes quantitative fit testing for all personnel wearing disposable face pieces; in most industrial applications that use disposable face pieces or dust masks, fit testing is not required or routinely performed. The Independent Oversight team also noted that the BJC industrial hygiene function has developed an effective individual-specific heat stress monitoring and control technique that uses personal heart rate as an indicator and a limiting criterion. This approach has the advantage of tailoring the work schedule and period to the individual and does not restrict anyone based on another's or group limitations. This technique also allows individual workers to monitor themselves

and empowers workers to take responsibility for maintaining body parameters within safe limits. Additionally, the K-25/K-27 project has implemented "cool rooms" in which workers can doff gloves and shoe covers, be surveyed, and then rest and rehydrate in cooler temperatures.

**BJC has effectively implemented rigorous controls to ensure that wastes are acceptable for disposal before being shipped from ETTP.** ETTP performs several independent reviews to confirm that waste streams will be within the disposal limits defined during negotiations with external regulators before



Aerial View of ETTP

waste is sent from ETTP for disposal. BJC requires all waste packaging activities to be reviewed by deployed waste packaging specialists prior to releasing the waste container so that they can certify that the waste meets the disposal requirements for offsite disposal. For waste being sent to the Environmental Management Waste Management Facility at the Oak Ridge Reservation, pads are used as an additional control to spread out and sort through waste to ensure removal of anomalous items. For waste being sent to the Nevada Test Site, a waste certification official must inspect the waste container and the specific items being placed in that container. These processes also ensure that radiological surveys have been performed on the waste items to confirm conformance to disposal limits.

**ORO-AMEM has made a number of enhancements in certain aspects of its oversight programs.**

Although further improvements are needed, ORO-AMEM has strengthened its Facility Representative program since the most recent Independent Oversight inspection of ORO and has implemented some new processes to provide ORO and AMEM managers with information about the status of ES&H programs and issues at ETTP. These include implementation of twice weekly safety briefings, weekly Facility Representative reporting, K-25/K-27 watch list meetings (which include a strong focus on ES&H issues and concerns), and the ORO Safety Attainment Board (chaired by ORO senior managers, focusing on safety and continuous improvement).



# 3 Weaknesses

Although some aspects of ES&H are effective, there are weaknesses in ETTP ES&H programs in a number of areas, most significantly in implementation of site work control and feedback and improvement systems.

**In some instances, BJC and K-25/K-27 management and supervision have not strictly enforced established processes in the areas of work scope definition and activity-level hazard analysis and controls, and have not ensured that certain conduct-of-operations requirements have been implemented with sufficient rigor for repetitive work performed under standing work packages.** Much work at K-25/K-27 is repetitive in nature, and work packages for these types of activities generally lack sufficient work scope definition to ensure proper implementation of the five core functions of ISM. Repetitive work packages do not always have clear start and end points, define the major items to be completed as the work progresses, or have a defined work scope that can be closed out and completed in a reasonable time period, as required by BJC institutional work planning requirements and as necessary to permit effective hazard analysis and control of work. In some cases, application of the activity hazard assessment process lacks sufficient rigor and was not performed in accordance with institutional requirements to ensure that all hazards and controls associated with the work were sufficiently tailored to the work being performed, clearly identified, understood, and communicated to workers. A similar concern exists with respect to application of the radiological work permit (RWP) and bioassay programs. Development of RWPs has not been in full accordance with institutional requirements, so the RWPs do not always accurately convey specific requirements for discrete job evolutions/tasks and ensure that controls are clearly defined and tailored to the work being performed. In addition, bioassay protocols in place for K-25/K-27 workers are not in full accordance with institutional policies and procedures, resulting in fewer bioassays than may be

necessary and a need to deviate from existing procedures to properly evaluate positive results. Similar process and conduct-of-operations weaknesses were evident in the development and implementation of SACs. Some observed work activities indicated that line management has not sufficiently ensured that work processes and procedures are adequate before work commences, that procedures are developed or modified to control new work or changes in conditions, and that work is performed in strict conformance with applicable safety requirements. (See Findings #C-1, #C-2, and #C-3.)



Transite Removal

**BJC has not established and implemented fully effective feedback and continuous improvement processes to drive continuous safety improvement at ETTP.** Planning and performance of assessments of safety-related programs, activities, and performance have been limited in number, scope, and rigor. Although many issues are adequately managed using the site issues management process and tracking tool, issues and actions from most occupational injuries and events not reportable to the DOE Occurrence Reporting and Processing System (ORPS) are not formally managed or tracked to completion. Causal and extent-of-condition analyses and identification of recurrence controls are often insufficient, especially with respect to work control and latent organizational weaknesses. Consequently, corrective actions target the direct causes (e.g., personnel retraining or correction of the involved deficient work package) rather than identifying similar conditions and addressing root causes with effective recurrence controls. The injury and illness reporting and investigation procedure does not describe the BJC process of screening of non-emergency occupational injuries, including cuts, scrapes, punctures, and insect bites performed by project Safety and Health staff to determine whether first aid or medical attention is required. Many minor injuries are being classified as “notice only” cases without examination by medical professionals. The ISM core functions for work planning and control are not always evaluated and addressed, and recurrence controls are not always adequately identified. Requirements and processes for managing events that do not meet ORPS reporting thresholds are insufficiently defined and inconsistently managed. Deficiencies in the investigation, analysis, and management of problems exist in each of the contractor assurance elements reviewed; these deficiencies were also identified during prior Independent Oversight inspections in 2003 and 2006. Corrective actions and recurrence controls have not been sufficient to prevent recurrences. (See Findings #D-4, #D-5, and #D-6.)

**ORO-AMEM oversight of the contractor assurance system has not been sufficient to ensure previously identified deficiencies are adequately addressed.** Corrective actions for the closure of some of the findings from the 2006 Independent Oversight ES&H inspection (both ORO-AMEM and BJC findings) were not adequate to prevent recurrence of the same deficiencies, as identified during this 2008 inspection, in the areas of assessments, self-assessments, and corrective action management. Several of the findings against BJC from previous Independent Oversight inspections have not been adequately addressed in such areas as work planning and control and feedback and improvement, and ORO-AMEM has not adequately verified the effectiveness of corrective actions before closing findings. Senior management attention at EM Headquarters and at ORO will be needed to ensure the adequacy of corrective action plans, verification of closure, and conduct of effectiveness reviews.

# 4

## Results

The following sections provide a summary assessment of the OR and ETP activities that Independent Oversight evaluated during this inspection.

### 4.1 Work Planning and Control

The Independent Oversight review of the ISM core functions focused on ES&H programs and work planning and control systems as applied to D&D work activities at ETP. Currently, most of the facility D&D work being performed at ETP is associated with the K-25/K-27 building demolition. Work activities were reviewed at the K-25/K-27 building D&D project and the ETP site D&D project.

For the activities observed by the Independent Oversight team that are governed by job-specific work packages, the scopes of work are well defined for D&D activities. However, much work at K-25/K-27 is repetitive and governed by a set of standing work packages that is subdivided into discrete work packages and re-used for different areas of the building. For these standing work packages, work scopes are not sufficiently defined and do not specify information required by BJC procedures such as clear start and end points, the major items to be completed as the work progresses, and a defined work scope that would be closed out and completed in a reasonable time period. These weaknesses have contributed to insufficient definition of work scopes in standing work packages at K-25/K-27, which contributes to weaknesses in application of activity-level hazard analysis processes to identifying hazards that need to be controlled for specific work tasks and also hinders effective application and implementation of other ISM core functions. (See Finding #C-1.)

The activity hazards assessment and RWP processes are used to analyze activity-level hazards at ETP. Other mechanisms, such as comprehensive radiological and industrial hygiene air sampling and monitoring, are performed to ensure that airborne hazards are tracked and understood. The activity hazards assessment process provides suitable mechanisms for identifying and analyzing activity-level hazards. However, the implementation lacks sufficient rigor and has resulted in some hazards not being appropriately identified, analyzed, and communicated so that appropriate controls for discrete work activities can be effectively implemented. (See Finding #C-2.)

BJC uses a variety of engineering and administrative controls, coupled with personal protective equipment to mitigate hazards. Some programmatic controls at the K-25/K-27 D&D project, such as fall protection, respiratory protection and heat stress monitoring, are comprehensive. However, at the task level, there is insufficient integration between activity hazards assessment controls and work instructions to ensure that all controls are clearly and accurately specified and communicated to workers. Work instructions have

not always been developed in strict compliance with corporate expectations and do not always include appropriate step sequencing for completion or required hold points. Work packages with incorrect controls have also been used to govern work activities rather than developing a new work package that accurately conveys the scope, location, and appropriate controls. In addition, implementation of the BJC RWP and bioassay processes has not been sufficient to ensure that all institutional expectations are delineated and followed and that radiological controls are adequately defined, tailored to the work, and effectively implemented. (See Findings #C-2 and #C-3.)

General safety requirements were followed for most work observed at ETTP. However, there were a variety of instances of poor work practices and task work being performed outside the bounds of specified controls, indicating a need for additional rigor in conduct of operations to ensure the continued safety of personnel. (See Finding #C-2.)

Overall, some aspects of the ETTP work planning process are effective, some hazards are adequately analyzed and controlled, and some ETTP controls are rigorous. However, there are systemic weaknesses in the application of work control processes for repetitive work activities, and workers and supervisors do not always rigorously and strictly adhere to controls and/or correct work documents when the specified controls are inadequate or cannot be strictly followed.

## 4.2 Focus Areas

**Hazardous Waste Management.** Environmental compliance requirements for hazardous waste management were established during negotiations with Federal and state regulators. These requirements use the Resource Conservation and Recovery Act (RCRA) as applicable or relevant and appropriate requirements (ARARs), under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). These hazardous waste requirements were used to establish and define controls for hazardous waste management areas. In providing direct support to the D&D projects in meeting these requirements, BJC has deployed environmental compliance and waste management expertise to work directly with project personnel. As a result, in almost all cases, hazardous waste is effectively managed within the BJC centrally located hazardous waste management areas that support D&D projects.

The D&D work planning and control process has not always been effective in adequately incorporating hazardous waste management controls into work packages. During performance of work, a few instances were identified in which hazardous waste was not managed in accordance with the requirements defined by the ARARs. In addition, newly generated waste was not sent for disposal in a reasonable time. As a result, a number of waste containers that could go to disposal have remained in storage for several years; for hazardous waste in two buildings awaiting D&D, this waste could remain for many more years, thus increasing the potential risk of a release and impacting waste management operations. (See Finding #C-1.)

**Specific Administrative Controls.** This Independent Oversight review focused on effectiveness of processes for implementing SACs at K-25/K-27. To assess effectiveness, Independent Oversight reviewed recent SAC-related events, ongoing activities at the field level, and a sample of technical safety requirements (TSRs) that delineate SACs. Most of the SACs are compensatory measures to control unique, short-term hazards associated with D&D activities.

BJC has established processes for translating SACs to work instructions (e.g., procedures, work packages). However, these processes are not sufficiently effective in ensuring that workers understand the actions

needed to comply with the SAC. The primary concern is that BJC processes typically result in work instructions that repeat the SAC verbatim rather than translating it into clear and simple instructions that can be readily understood and implemented by workers at the activity/task level. The BJC approach to work instructions is not effective and is not consistent with DOE standards, which specify that work instructions provide action steps in simple and direct language. (See Findings #E-1 and #C-2.)

Some aspects of SAC implementation are effective. For the most part, ETTP personnel are adequately trained and able to satisfactorily perform surveillance tests and inspections for SAC-related items. In addition, the BJC process for controlling combustibles is robust, with some exceptions. However, ETTP has experienced several SAC-related TSR violations at K-25/K-27, and the Independent Oversight team observed deficiencies in implementing the SACs at the activity level in some cases. These deficiencies are largely attributable to the deficiencies in translating the SACs into instructions that are suitable for workers. (See Finding #E-1.)

BJC has implementation verification reviews, and ORO-AMEM and BJC assessments have identified a number of implementation deficiencies and prompted corrective actions for these identified deficiencies. However, BJC implementation verification reviews and other BJC and ORO-AMEM assessments have not resulted in improvements that address an important root cause of some implementation deficiencies (i.e., verbatim use of SACs/TSRs that can result in work instructions that are not readily understood by D&D workers). BJC is currently re-examining at the implementation verification reviews process to ensure robust SAC implementation and plans a special assessment of the implementation verification review process. These process improvements are positive steps, and the causal analysis of performance deficiencies is under way. (See Finding #D-1 and Finding #D-4.)

Overall, there are weaknesses in processes for translating SACs to work at K-25/K-27, leading to some deficiencies in implementing SACs at the activity level. BJC and ORO feedback processes have identified and corrected some implementation deficiencies, but they have not adequately addressed some causes of these deficiencies.

### 4.3 Feedback and Improvement

**EM and ORO-AMEM.** EM has adequate processes to maintain awareness of ES&H issues at ETTP. However, EM has not been effective in ensuring that deficiencies are adequately addressed.

ORO-AMEM has made a number of improvements since the 2006 Independent Oversight inspection and has a number of effective elements of an adequate line management oversight program. ORO-AMEM has made progress in defining an adequate baseline assessment program, and the technical rigor and quality of assessments has improved. Most assessments that were reviewed were adequate and added value. As part of its improvement efforts, ORO-AMEM has initiated development of a program for trending ES&H information. ORO-AMEM holds monthly project watch list reviews (for the ETTP K-25/K-27 D&D Project) that include appropriate information on ES&H issues and concerns. ORO-AMEM's other mechanisms for maintaining operational awareness include monthly project performance review meetings to discuss ES&H information (as well as project cost and schedule information), such as information on injuries, illness, and skin contaminations. The ORO-AMEM technical qualification program is well documented and mature. The ORO-AMEM Facility Representative program has been improved since the 2006 Independent Oversight inspection, and ORO-AMEM has placed a high priority on increasing Facility Representative staffing. The recently implemented Facility Representative weekly reports identify

valid ES&H concerns and issues and are widely disseminated within ORO and AMEM. The AMEM safety system oversight program has improved since the last inspection and is functioning adequately. The ORO operating experience and lessons learned program, Federal employee occupational safety and health (FEOSH) program, and employee concerns program meet applicable requirements and are adequately implemented.

However, ORO-AMEM has not been sufficiently effective in addressing some longstanding and recurring weaknesses in oversight and ETTP ES&H programs. There are continuing weaknesses in the ORO-AMEM assessments and corrective action management programs. Corrective actions for closing some of the findings from the 2006 Independent Oversight ES&H inspection were not adequate to prevent recurrence of the same deficiencies, as identified during this 2008 inspection in the areas of assessments, self-assessments, and corrective action management. ORO-AMEM has not ensured adequate and timely verification of closure of BJC corrective actions before closing findings in such important areas as work planning and control and BJC feedback and improvement. (See Finding #D-1.)

Some assessment results have not been documented as required, and some assessments and walkthroughs were not performed as required. ORO-AMEM has postponed or cancelled a number of scheduled BJC technical assessments that cover important elements of ISM (i.e., unreviewed safety question determinations, and the contractor assurance program), citing shortages of technical resources. Information in the site corrective action management tracking system is not complete because data has not been entered in accordance with procedures. In addition, the ORO-AMEM self-assessment program is not sufficiently defined and is not rigorously implemented. (See Finding #D-1.)

ORO and AMEM have not developed an adequate differing professional opinion program and have not performed required assessments of the employee concerns program. ORO-AMEM recognizes that further improvement is needed in some areas, such as issue and corrective action documentation, tracking, and evaluation of corrective actions. (See Findings #D-2 and #D-3.)

**ETTP/BJC.** BJC conducts a variety of independent and management assessment and inspection activities. Although some assessment activities are effective in evaluating programs and performance and driving improvement, some assessment processes have not been sufficiently defined or demanding. Planning and performance for both internal independent and management assessments often lack sufficient rigor to effectively monitor and evaluate safety performance. Independent assessment planning has not been formally performed or documented. Such management systems as the assessment and occupational injury and illness investigation programs have not been assessed. Line organizations have not assessed their implementation of many safety management systems, such as assessments, issues management, event and injury investigation, and lessons learned. Many assessments, both independent and management, are too limited in scope, focusing on single documents, conditions, or activities. There is insufficient focus on observation of work and verification of effective process and program implementation through review of performance records. Many lines of inquiry identified in the scope and plans are not addressed, and the bases for conclusions are frequently not documented. (See Finding #D-4.)

Although BJC has established a generally adequate program for managing safety issues from identification to verification of effectiveness, process and implementation deficiencies hinder the effectiveness of this assurance system program. Deficiencies in issues management were found to be common to every feedback and improvement area at ETTP. Issues and actions for injuries and illnesses, safety inspections, and incidents that do not meet ORPS reporting thresholds are typically not formally managed or tracked to completion. Causal analysis is not consistently rigorous or well documented, and recurrence controls are too often insufficient. (See Finding #D-5.)

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Many operational incidents and events are identified, reported, and investigated at ETTP, and related issues are being resolved. Processes for identifying, responding to, reporting, investigating, and managing events and associated issues are detailed in formal BJC procedures. Critiques and fact-finding meetings are frequently held for timely identification of the circumstances of events. However, in many cases, event, critique and fact-finding reports do not provide sufficient descriptions of all conditions and pertinent information about the incidents/event, especially the identification of all work planning and control aspects. Investigations and causal analyses sometimes lack sufficient rigor to identify all contributing causes or fail to go far enough to identify underlying root causes. Consequently, effective recurrence controls have not been identified or implemented. Recurring injuries and operational events related to work control deficiencies persist. (See Finding #D-6.)

Processes and performance for the investigation of occupational injuries and illnesses and management of corrective actions and recurrence controls lack sufficient rigor to demonstrate appropriate and effective analysis and response to these safety events. The ISM aspects of injuries and exposures are often insufficiently identified or analyzed. Corrective actions and recurrence controls are not formally tracked to completion. The accident/incident investigation and reporting procedure does not accurately detail the process and requirements for identifying, screening, and reporting occupational injuries and exposures. (See Finding #D-7.)

BJC employees have various mechanisms to report and obtain resolution of safety concerns. In addition, BJC has established and implemented a lessons learned program that provides a user friendly database of information on the intranet, dissemination of external operating experience to line and support organizations, and generation and dissemination of internal lessons learned. There is much evidence of the use of lessons learned by line organizations, and BJC shares many lessons learned with the DOE complex. However, there are some process and performance weaknesses in these programs. For example, there is no formal screening, subject matter evaluation, or targeted distribution of external operating experience, either at the institutional level or by line and support organizations, except for product recalls and similar hardware issues. Also, not all aspects of some concerns are addressed, and the justifications for final resolutions are not always adequately documented.

Overall, BJC has established and implemented processes for the various elements of a contractor assurance system as delineated in DOE Order 226.1A. Although some of these processes are adequately defined and in many cases are implemented effectively, there are process and procedure weaknesses and implementation deficiencies in several areas that hinder fully effective safety oversight. Some procedures lack sufficient detail, clear responsibilities, and process controls, and some have not been maintained to reflect the way work is performed. Implementation of assurance system programs lacks sufficient rigor in identifying, investigating, and implementing recurrence controls for program and performance deficiencies. Evident in every feedback and improvement program evaluated was the lack of rigor in investigating and analyzing deficiencies to accurately identify root causes and to establish recurrence controls. Line management has not sufficiently taken ownership of or been sufficiently held accountable for assurance system performance. Longstanding work control issues persist, and little progress has been made to address some of them. Most of the identified process and performance deficiencies in each feedback and improvement area were previously documented by Independent Oversight in the 2003 and 2006 inspection reports.

# 5

## Conclusions

ETTP has some effective safety program elements, such as notably effective programs for fall protection, respiratory protection, and heat stress. In addition, ORO-AMEM has made a number of improvements in various aspects of its oversight program.

However, ORO-AMEM's and BJC's progress in addressing the longstanding deficiencies in their oversight programs and work planning and control processes has been slow, and in some cases progress has been limited and/or corrective actions were not effective. Many of the current weaknesses in ORO oversight, BJC feedback and improvement processes, and BJC work control processes were identified during previous Independent Oversight inspections and ETTP self-assessments, but they have not been adequately addressed. A significant contributing factor is that ORO-AMEM and BJC have closed previous findings without performing adequate reviews to verify the effectiveness of corrective actions.

Increased EM, ORO, and BJC attention is needed to develop a strategic and risk-based approach to making the needed improvements. Priority attention needs to be placed on significantly enhancing ORO-AMEM and BJC corrective action management processes and ensuring that ETTP line management is sufficiently engaged in safety management and is held accountable for safety program compliance and performance.



# 6 Ratings

The ratings reflect the current status of the reviewed elements of ETTP ES&H programs.

| <b>WORK PLANNING AND CONTROL – CORE FUNCTIONS #1-4</b>        |                   |
|---|-------------------|
| Core Function #1 – Define the Scope of Work                   | NEEDS IMPROVEMENT |
| Core Function #2 – Analyze the Hazards                        | NEEDS IMPROVEMENT |
| Core Function #3 – Develop and Implement Controls             | NEEDS IMPROVEMENT |
| Core Function #4 – Perform Work Within Controls               | NEEDS IMPROVEMENT |
| <b>FEEDBACK AND CONTINUOUS IMPROVEMENT – CORE FUNCTION #5</b> |                   |
| OR Feedback and Continuous Improvement Processes              | NEEDS IMPROVEMENT |
| ETTP Feedback and Continuous Improvement Processes            | NEEDS IMPROVEMENT |

## Purpose of Ratings

The Office of Independent Oversight uses a three-tier rating system that is intended to provide line management with a tool for determining where resources might be applied toward improving ES&H. It is not intended to provide a relative rating between specific facilities or programs at different sites because of the many differences in missions, hazards, and facility life cycles, and the fact that these reviews use a sampling technique to evaluate management systems and programs. The rating system helps to communicate performance information quickly and simply. The three ratings are:

- Significant Weakness (Red)
- Needs Improvement (Yellow)
- Effective Performance (Green).

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## APPENDIX A

### Supplemental Information

#### A.1 Dates of Review

|                                |                       |
|--------------------------------|-----------------------|
| Planning Visit                 | August 4-7, 2008      |
| Onsite Inspection Visit        | August 18-28, 2008    |
| Report Validation and Closeout | September 16-18, 2008 |

#### A.2 Review Team Composition

##### A.2.1 Management

Glenn S. Podonsky, Chief Health, Safety and Security Officer  
 Michael A. Kilpatrick, Deputy Chief for Operations, Office of Health, Safety and Security  
 William Eckroade, Director, Office of Independent Oversight  
 Thomas Staker, Director, Office of Environment, Safety and Health Evaluations  
 William Miller, Deputy Director, Office of Environment, Safety and Health Evaluations

##### A.2.2 Quality Review Board

|                    |                  |                 |                |
|--------------------|------------------|-----------------|----------------|
| Michael Kilpatrick | William Eckroade | Thomas Staker   | William Miller |
| Dean Hickman       | Robert Nelson    | William Sanders |                |

##### A.2.3 Review Team

|                             |              |                |                |
|-----------------------------|--------------|----------------|----------------|
| William Miller, Team Leader |              |                |                |
| Phil Aiken                  | Jimmy Coaxum | Vic Crawford   | Ivon Fergus    |
| Bob Compton                 | Ed Greenman  | Gordon Quillin | Mario Vigliani |

##### A.2.4 Administrative Support

Laura Crampton  
 Tom Davis

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## APPENDIX B

### Site-Specific Findings

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

| FINDING STATEMENTS |  |
|--------------------|--|
| C-1                | K-25/K-27 D&D project management has not ensured that work scopes for repetitive tasks are sufficiently documented and/or tailored to specific work evolutions such that associated hazards can be properly identified and controlled, and all core functions of ISM can be effectively implemented, as required by BJC-FS-1001 and DOE Policy 450.4, <i>Safety Management System Policy</i> .   |
| C-2                | In some instances, BJC management and supervision have not strictly or adequately enforced established safety requirements and processes in the areas of hazards analysis and control, including activity hazards assessment process implementation, development of work instructions, and conduct of operations requirements, with sufficient rigor, as required by institutional procedures and DOE Policy 450.4, <i>Safety Management System Policy</i> . |
| C-3                | BJC management and supervision have not ensured effective implementation and flowdown of some radiological requirements and policies associated with RWPs and bioassays to ensure that adequate radiological control of work activities can be maintained, as required by the BJC radiation protection program; DOE Policy 450.4, <i>Safety Management System Policy</i> ; and 10 CFR 835.   |
| D-1                | AMEM has not sufficiently developed or implemented effective assessment, self-assessment, and corrective action programs in accordance with DOE Order 226.1A, <i>Implementation of DOE Oversight Policy</i> .  |
| D-2                | ORO has not defined roles and responsibilities for the implementation of a differing professional opinion program in accordance with DOE Policy 411.1, <i>Safety Management Functions, Responsibilities, and Authorities</i> .   |
| D-3                | ORO has not ensured adequate implementation of the BJC employee concerns program and the ORO employee concerns program by formal oversight in accordance with DOE Order 442.1A, <i>Employee Concerns</i> .   |
| D-4                | BJC has not implemented a sufficiently comprehensive and effective self-assessment program that evaluates safety activities and management systems at appropriate frequencies or with the rigor needed to identify process and performance deficiencies as required by DOE Order 226.1A and ETPP ISM program documents.  |
| D-5                | BJC has not implemented a sufficiently effective issues management program that rigorously analyzes problems and identifies appropriate and effective recurrence controls as required by DOE Order 226.1A and ETPP ISM program documents.  |
| D-6                | BJC has not implemented a sufficiently effective event investigation and reporting program that thoroughly and accurately identifies root causes, establishes effective recurrence controls, and ensures formal tracking of actions to closure as required by DOE Order 226.1A and ETPP ISM program documents.   |

|     |  |
|-----|--|
| D-7 | BJC has not established and implemented an effective program for the management of occupational injuries and illnesses that ensures medical evaluation of all injuries, rigorous investigation and analyses of conditions and causes, identification of recurrence controls, and formal tracking of corrective and preventive actions to closure as required by DOE Order 226.1A and ETTP ISM program documents. |
| E-1 | BJC has not ensured that some SAC-related requirements are adequately translated to effective work instructions and are effectively implemented at the activity level, as required by 10 CFR 830 and DOE Order 5480.19, <i>Conduct of Operations Requirements for DOE Facilities</i> .   |



