5.0 CORRECTIVE ACTION PLAN

This section summarizes the corrective actions developed by DOE-ORO and BJC to address the root causes of the identified issues. As the assessments and reviews were completed, compensatory measures were implemented where needed to assure the safety of ongoing operations. Tables 5.1 and 5.2 provide summaries of immediate corrective actions initiated or completed by DOE-ORO and by BJC, respectively. Initial actions and compensatory measures included:

- Implementation of facility-specific compensatory measures or operational limitations where needed to assure continued safe operations for all DOE-ORO EM nuclear facilities.
- Completion by BJC of comprehensive flowdown assessments for all nuclear facilities to identify any concerns related to technical adequacy, flowdown of requirements, implementation, and compliance.
- Completion by DOE-ORO of an independent verification of the SB flowdown assessments performed by BJC.
- Completion of a joint DOE-ORO BJC technical adequacy review of SB hazards and accident analyses.
- Revocation of DOE-ORO and BJC ISMS verification and initiation of planning for a comprehensive re-verification of ISMS programs, including management systems beyond SB.
- Allocation of additional experienced resources to supplement ORO and BJC staff in the performance of essential nuclear safety functions.
- Modifications of the M&I contract for areas where gaps in the WSS were identified.

This CAP presents more than 100 corrective actions to address specific issues, findings, and observations cited by the DNFSB, the DOE-HQ Independent SB Assessment, DOE-ORO assessments and BJC self assessments. However, DOE-ORO and BJC have focused the actions collectively to attain an overall objective. DOE-ORO and BJC view the completion of this CAP as an opportunity to realize significant improvements to their respective nuclear safety and ISM programs. The overall objective is to assure the protection of the public, workers, and environment through implementation of technically adequate and 10 CFR 830 Subpart B-compliant SB documents, tailored to current missions and hazards, with an effective, enabling ISMS and supporting Safety Management Programs (SMPs).

The DOE-ORO and BJC analyses have identified the conditions and factors that contributed to areas of concern and issues, and have provided a basis for definition of corrective actions. Implementation of these actions will achieve the overall DOE-ORO/BJC objective. Upon completion of these corrective actions, the following improvements will have been implemented:

- Current SB documents will be controlled, their technical adequacy and implementation confirmed, with compensatory measures applied where needed to assure safety and corrective actions effected for identified findings. (Table 5.4-1)
- DOE-ORO roles, responsibilities, authorization, and accountabilities will have been clarified, and actions completed to address staffing deficiencies and to confirm technical competence. (Table 5.7)
- The M&I contract WSS will have been modified to incorporate orders and standards determined to be needed for effective safety management. (Tables 5.5 and 5.6)
- DOE-ORO and BJC management system improvements needed to support SB development, renewal, approval, and implementation will be in place. (Tables 5.3 and 5.4-3)
- SMP improvements will have been implemented to complement and support Documented Safety Analysis (DSAs). (Table 5.4-2)
- DOE-ORO and BJC training/qualification process will have been implemented and training completed. (Tables 5.7 and 5.8)

- DOE-ORO ISMS process improvements will have been implemented, providing a basis for re-verification. (Table 5.9)
- BJC ISMS process improvements will have been implemented to promote maturity and provide a basis for DOE re-verification. (Table 5.10)
- Categorization of facilities will have been verified to be compliant with DOE Standard 1027-92. (Table 5.4-4)
- BJC will have developed and submitted for DOE review and approval 10 CFR 830 Subpart B-compliant DSAs for all EM nuclear facilities. (Table 5.4-4)

DOE-ORO and BJC believe that completion of the improvements summarized above will meet our stated objective.

For each corrective action summary table presented in Sections 5.1 through 5.4, links are provided to the DNFSB area of concern, the issue, the root cause(s), and causal factors. The tables also provide action completion dates and reference to the applicable DOE-HQ independent SB assessment findings and recommendations. For reference, Table 5.0 provides a crosswalk from the root causes to the corrective action tables (Tables 5.3 through 5.10).

Table 5.0 Crosswalk from Root Causes to Corrective Action Tables

Root Cause	DOE-ORO Corrective Actions	BJC Corrective Actions
The DOE-ORO and BJC processes and organizational alignment for management of AB documents have not been fully integrated, nor well documented.	Table 5.3	Tables 5.4-1, 5.4-2, 5.4-3, 5.4-4
The WSS process failed to identify an adequate set of nuclear safety standards.	Table 5.5	Table 5.6
The BJC training and qualification for personnel involved in nuclear facility operations did not meet the expectations of DOE Order 5480.20A, which was not included in the BJC contract.	—	Table 5.8
The ORO belief that the nuclear safety risks for the BJC work were not significant.	Tables 5.3, 5.5, 5.7	—
Lack of management accountability and consequences for not having approved SB documents.	Table 5.3, 5.7	—
The maintenance of ISMS was not effective.	Table 5.9	Table 5.10
Lack of management priority and accountability for closing ISMS system deficiencies.	Table 5.9	—

5.1 SB CORRECTIVE ACTIONS

EM manages 118 Category 2 and 3 nuclear and 256 radiological facilities at five sites in three states. Facility types include inactive burial grounds, waste storage facilities, waste treatment facilities, materials storage facilities, and D&D facilities. EM nuclear facilities are governed by 32 current sets of SB documents, with 148 separate SB documents (both bases documented safety analyses and associated DOE approval documents).

The SB corrective actions defined below respond to the internal and external assessments described in Section 2.0. Figure 5.1 illustrates the key assessment activities conducted and planned to assure the adequacy of the SB for each nuclear facility for authorized operations and activities. These

actions will confirm and assure continued safe operations for all EM nuclear facilities. In addition, upon completion of the SB upgrades by April 2003, EM will have developed 10 CFR 830 Subpart B-compliant DSA.

This section summarizes the corrective actions developed by DOE-ORO and BJC to address the findings and recommendations that are specific to the SB process, and to address the causal factors and root cause defined in Section 3.0.

The defined corrective actions include those already underway as part of the earlier NTS report and the ISMS Improvements effort, and several new actions developed to address findings and recommendations from the various assessments completed.

5.1.1 DOE CORRECTIVE ACTIONS

DOE corrective actions are summarized in Tables 5.3. Appendix A provides further detail for these corrective actions.

Table 5.1 Summary of Immediate Corrective Actions Initiated or Completed by DOE-ORO

SAFETY BASIS
DOE-ORO suspended fissile material handling at ETTP, pending resolution of R/CAAS TSRs issues
All ORO-EM SB documents require concurrence by ORO NSD prior to submittal to EM-1
Recommendations from HQ Independent SB Review Team incorporated into SB Flowdown Assessments
DOE-EM performed independent verification of BJC SB Flowdown Assessment, including review by Senior DOE-ORO Board
DOE-ORO performed joint review with BJC of SB Technical Adequacy for Operating Cat. 2/3 Facilities
DOE-ORO performed a review of BJC Hazard Categorization Process
Established joint DOE/BJC SB Working Group for SB updates and 830 upgrades
DOE ORDERS OF INTEREST TO THE BOARD
OR directed BJC incorporation of DOE Orders 5480.19, 5480.20A, 420.1 Change 3 (Section 4.2, *Fire Protection*), and DOE STD 1120.98
DOE-HQ conducted an independent review of M&I Contract Requirements Adequacy
OR-directed BJC prepare 17 Type I and 4 Type II changes
EFFECTIVENESS OF ISMS IMPLEMENTATION
DOE-ORO Manager revoked ORO and M&I ISMS Verification
Approval authority for Category 3 and higher facilities pulled back to EM-1
DOE-ORO initiated re-evaluation of previous ISM OFI
DOE-ORO issued Nuclear Criticality Program Description
Integrated ISMS Improvements Project Team established with DOE-ORO Deputy Manager or Project Manager
ROLES & RESPONSIBILITIES/TECHNICAL COMPETENCY
Director of High Level Waste Operations at Savannah River Site detailed to ORO to provide technical support
Two Excepted Service positions posted for EM and NSD
OR EM Program Managers received AB training
OR modified training/qualification requirements to include nuclear safety training for Program Managers
EM Facility Representatives (FRs) report weekly to the Oak Ridge Deputy Manager for Operations regarding BJC Nuclear Facilities
DOE-ORO issued Formal Instructions for the review and approval of AB documents
DOE-ORO hired Nuclear Criticality Safety (NCS) Engineer
ORO is revising its Functions, Roles, and Accountability Matrix (FRAM) to reflect current EM Authorities

Table 5.2 Summary of Immediate Corrective Actions Initiated or Completed by BJC

SAFETY BASIS
NTS Report issued with Root Cause and CAP
Nuclear Facility Safety Assessment completed for all Category 2 and 3 nuclear facilities
Continued Operations Assessment Review conducted with DOE-EM and DNFSB representative Suspended actions at 13 facilities; 5 remain suspended
SB Review Board established
Nuclear Facility SB Documentation List issued and approved by DOE-ORO
Radiological Facility List issued
SB Flowdown Assessments completed for all Category 2 and 3 nuclear facilities
Joint DOE/BJC SMP Assessment initiated (Fire Protection & Emergency Management [FP&EM])
Joint DOE/BJC SB Technical Adequacy Assessment completed
Ongoing operations safety assessment issued to DOE
DOE ORDERS OF INTEREST TO THE BOARD
Review of DOE Orders of interest to DNFSB completed
Early implementation of four orders initiated
Began preparation of DOE-directed Type I (17) and Type II (4) changes
EFFECTIVENESS OF ISMS IMPLEMENTATION
Managers of Projects' (MOPs) Assessment of ISMS Implementation completed
Complete re-evaluation of previous ISM OFI
Corporate Independent Oversight Team established
Integrated ISMS Improvements Project Team established with Project Manager, Deputy Project Manager, and Team Leads
ROLES & RESPONSIBILITIES/TECHNICAL COMPETENCY
Senior Nuclear Safety Technical Advisor named
Update of Nuclear Facility Training and Qualifications Program initiated
Hired senior BJC Nuclear Safety Manager
Hired two additional Nuclear Safety staff

Figure 5.1 Confirm Nuclear Facility SB for Operations

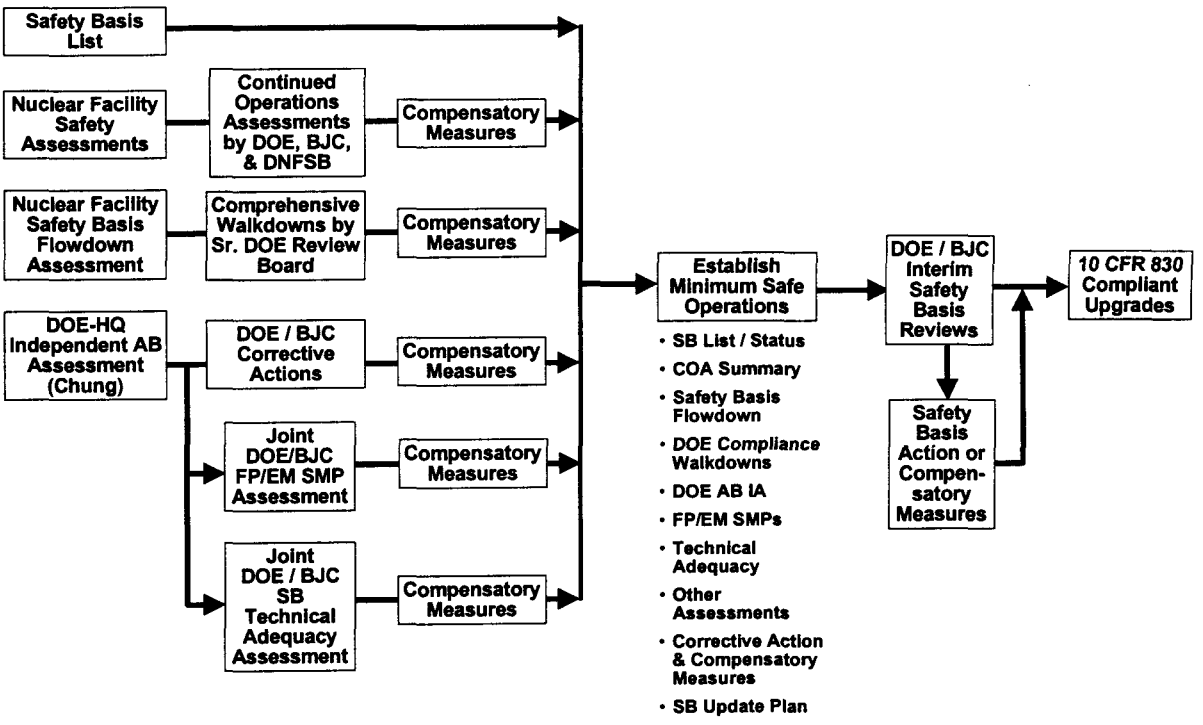

Table 5.3 ORO Corrective Actions for SB Improvements

DNFSB AREA OF CONCERN: Safety Basis

ISSUE(S): Inadequate SB authorization and management system for AMEM nuclear facilities managed by BJC.

ROOT CAUSE(S):

- A belief that the nuclear safety risks for the BJC work were not significant.
- A lack of accountability and consequences for not having approved SB documents.

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/ORSB-2 No consequences for not having an approved SB documents. ***CF/ORSB-3*** Lack of management priority and accountability.	Determine root causes for the SB issues identified and corrective actions.	OR/MG1-1	MG1	April 2, 2002 (complete)
	Identify missing management systems and processes needed to adequately review and approve SB documents.	OR/MG1-2	MG1	April 30, 2002
	Design and codify the necessary management systems and processes.	OR/MG1-3	MG1	May 15, 2002
	Issue organization-specific procedures, as needed, to implement the necessary management systems and processes (AMESH, AMEM, Assistant Manager for Assets Utilization [AMAU], Assistant Manager for Laboratories [AML]).	OR/MG1-4 OR/MG1-5 OR/MG1-6 OR/MG1-7	MG1	May 30, 2002
	Implement organization-specific procedures, as needed, to implement the necessary management systems and processes (AMESH, AMEM, AMAU, AML).	OR/MG1-8 OR/MG1-9 OR/MG1-10 OR/MG1-11	MG1	July 1, 2002
	Verify implementation and adequacy of the necessary management systems and processes.	OR/MG1-12	MG1	October 1, 2002
	Manager M1-Issues expectation for manager accountability for SB and incorporate into M-1 and M-2 performance standard.	OR/MG4-1	MG4	April 30, 2002

Table 5.3 ORO Corrective Actions for SB Improvements (continued)

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/ORSB-4 Lack of an ORO wide procedure for development, review, and approval of SB documents. Roles and responsibilities for AMEM and AMESH were not clear. ***CF/ORSB-6*** Lack of an independent SB assessment function. ***CF/ORSB-8*** SB decisions are expert-based, relying on key individuals, rather than a standards-based system driven by requirements and supported by established systems and procedures.	Incorporate expectations into AMEM, AMESH, AML, and AMAU performance standards.	OR/MG4-2 OR/MG4-3 OR/MG4-4 OR/MG4-5	MG4	March 29, 2002 (complete)
	Independently assess the effectiveness of the accountability process.	OR/MG4-6	MG4	April 1, 2003
	Evaluate effectiveness of implemented process to identify overlaps, gaps, and metrics.	OR/MG2-7	MG2	November 15, 2002
	Interim: Issue roles and responsibilities under M-2 signature.	OR/MG2-8	MG2	December 20, 2001 (complete)
	Long-term: Define roles and responsibilities in an ORO Directive.	OR/MG2-9	MG2	May 31, 2002
	Assess and implement compensatory measures to ensure safety of current operations.	OR/SB3-1	SB3	May 30, 2002
	Ensure DSAs are updated in accordance with 10 CFR 830.	OR/SB3-2	SB3	April 1, 2003
	Establish ORO Criticality Safety Program Description and generic implementing procedure.	OR/SB4-1	SB4	March 28, 2002 (complete)
	Review and accept BJC generic SMP descriptions.	OR/SB4-2	SB4	June 5, 2002
	Develop strategies for SMP implementation in SB documents.	OR/SB4-3	SB4	July 1, 2002
	Review and comment on BJC DSA implementation guides/manuals.	OR/SB4-4	SB4	July 1, 2002

Table 5.3 ORO Corrective Actions for SB Improvements (continued)

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
	Close out open CATS items regarding criticality safety.	OR/SB4-5	SB4	November 1, 2002
	Ensure incorporation of DOE O 420.1 in BJC WSS as appropriate.	OR/SB7-1	SB7	March 29, 2002 (complete)
	Ensure FHAs are conducted at BJC facilities and integrated into BJC SB documents, as appropriate.	OR/SB7-2	SB7	April 1, 2003
	Verify the FHAs are appropriately incorporated into SBs for UT Battelle and BNFL.	OR/SB7-3	SB7	August 1, 2002

5.1.2 BJC CORRECTIVE ACTIONS

BJC SB corrective actions have been organized into the following general areas:

Nuclear Facility SB Assessments – In response to internally identified findings and concerns associated with the DNFSB letter, BJC has initiated actions and assessments to assure the adequacy of current BJC SB documents. These corrective actions are defined in Table 5.4-1, Nuclear Facility Safety Assessments. As individual assessments are completed, the associated findings and observations are evaluated to determine safety significance, corrective actions defined, entered into the BJC I/CATS, and actions tracked to completion. Where needed, compensatory measures are implemented. Any conditions that meet applicable criteria are addressed through the DOE Occurrence Reporting System and/or are documented as a potentially inadequate safety analysis (PISA).

SMP Improvements – In response to identified issues and or concerns from internal and external reviews, BJC has initiated actions to achieve needed improvements in BJC SMPs and their implementation. These corrective actions are defined in Table 5.4-2, SMP Improvements.

SB Process Improvements – Based on the scope of work associated with updating and upgrading BJC SB documents. BJC has initiated actions to improve BJC SB development process and tools for use in development, maintenance, and implementation of SB documents and to support actions to achieve compliance with 10 CFR 830 Subpart B. These corrective actions are defined in Table 5.4-3, SB Process Improvements.

SB Document Updates and Upgrades – BJC has initiated actions to manage and control updates and upgrades to BJC SB documents to address findings and issues from the SB assessments and to achieve 10 CFR 830 Subpart B compliance. These corrective actions are defined in Table 5.4-4, SB Updates and Upgrades.

The BJC corrective actions defined in Tables 5.4-1 through 5.4-4 address the findings and recommendations from the DOE-HQ Independent Assessment related to the BJC SB process and associated documents. These tables provide a comprehensive listing of SB corrective actions, and provide a cross-reference (as applicable) to the associated finding from the DOE-HQ Independent Assessment Report, the applicable causal factor(s) described in section 3, and the NTS report. Many of these SB corrective actions were initiated by BJC based on internal assessments or as defined in the NTS report prior to the issuance of the DOE-HQ Independent Assessment Report. In some instances, the scope and/or focus of actions underway were revised based on input from the DOE-HQ Independent Assessment review team. Appendices B and C provide further detail for these corrective actions.

Table 5.4-1 BJC Corrective Actions for Nuclear Facility Safety Assessments

DNFSB AREA OF CONCERN: Safety Basis

ISSUE(S): Development, maintenance, and implementation of SB documents has not been managed to consistently assure adequat implementation.

ROOT CAUSE: The DOE-ORO and BJC processes and organizational alignment for management of AB documents have not been full integrated, nor well documented.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-1 Facility hazard documents were developed by multiple organizations from multiple prime contractors at five sites over many years to varying standards/procedures with varying DOE expectations, reviewers, and review processes.	Issue and obtain DOE approval of a single SB list identifying all SB documents for Category 2 & 3 Nuclear Facilities for the five sites.	BJC/MG5c-79	MG5c	December 12, 2001 (complete)
CF/BJCSB-2 Expectations and requirements with respect to AB and facility hazard document development, maintenance, and implementation have evolved and changed from DOE orders to WSS to 10 CFR 830 Subpart B, while the base documents have remained unchanged. "Old" documents are sometimes reviewed per new standards and found lacking.	Verify that Nuclear Facility SB documents and the SB list are in the BJC records management center.	BJC/MG5c-81	MG5c	April 30, 2002
CF/BJCSB-3 Traditional AB document structures (SARs , BIOs etc.) and associated safety analysis requirements, e.g., natural phenomena, were developed/designed for operating facilities and have not been "readily applicable" to many EM facilities (shutdown, inactive facilities, burial grounds, contaminated sites, etc.) and activities (facility S&M, environmental remediation, D&D, etc.). Many of these issues will be resolved as documents are updated to 10 CFR 830, Subpart B, Safe Harbor Methodology.	Conduct reviews of AB documents for all Category 2 and 3 nuclear facilities to assess flowdown of requirements into subcontracts and implementing documents, technical adequacy of AB documents, knowledge and understanding of BJC and subcontractor staff, and implement compensatory measures if needed.	BJC/SA1d-56 BJC/SA3a-65	SA1d SA3a	March 21, 2002 (complete)

Table 5.4-1 BJC Corrective Actions for Nuclear Facility Safety Assessments (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-4 In some instances, the technical basis supporting AB documents is not clearly documented and does not meet current expectations. ***CF/BJCSB-5*** Updating AB documents has been viewed by some DOE, BJC, and subcontractor personnel to be lesser importance for some EM facilities due to their shutdown, inactive status and planned disposition, resulting in a lack of rigor in AB management and implementation. ***CF/BJCSB-6*** While AB documents, i.e., SARs and BIOs, have been maintained via the USQD process, periodic updates/revisions have not been processed, resulting in some AB documents having numerous USQDs and being difficult to understands, implement, and utilize. ***CF/BJCSB-7*** DOE and BJC have been reluctant to expend resources to update AB documents for shutdown, inactive facilities planned for demolition/disposition/ remediation. Instead, resources have been allocated to development of safety documents needed for S&M, remediation, and D&D projects. ***CF/BJCSB-9*** The basis for facility categorization developed by the prior prime contractor, has not been maintained current, and have not been well understood by DOE-ORO and BJC managers. Although the due diligence report submitted by BJC in October 1998 identified that the AB documents had been prepared by the prior contract and not BJC, DOE-ORO EM and BJC relied on the adequacy of those documents for continued EM activities.	Conduct assessments of FP&EM SMP implementation to supplement SBFD	BJC/SA1a-1 BJC/SA1a-19 BJC/SA1a-55 BJC/SA3a-66	SA1a SA3 SA1c	April 30, 2002
	Conduct SB technical adequacy assessment to supplement SBFD assessment, document results, and define corrective actions.	BJC/SA1c-54 BJC/SB1a-97 BJC/SB2a-101	SA1c SB1a SB2a	March 1, 2002 (complete)
	Conduct a joint DOE/BJC Nuclear Facility Safety Assessment of SB for each BJC nuclear facility to ensure that the current SB provides an adequate foundation for ongoing operations and activities pending completion of updates to the SB documents in accordance with 10 CFR 830 Subpart B.	BJC/MC1-1	NA	June 30, 2002
	Validate facility categorization and inventory controls.	BJC/MC2-1	NA	August 1, 2002
	For all BJC category 3 facilities, issue to DOE for approval an updated hazards assessment document with updated hazard categorization.	BJC/SB5a-113	SB5	April 10, 2003

Table 5.4-1 BJC Corrective Actions for Nuclear Facility Safety Assessments (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-10 AB for EM facilities were administered for many years on a decentralized basis without an integrated, central document control and record management process, resulting in difficulties in identifying and assuring completeness of AB documents. While actions have been taken to strengthen the document control and records management process for AB documents, further improvement is needed. ***CF/BJCSB-14*** In some cases DOE-ORO EM, BJC, and subcontractor personnel with facility management responsibility for AB development and implementation have not been sufficiently familiar with AB documents, requirements, and implementation. ***CF/BJCSB-18*** The flow-down of SB requirements into BJC and subcontractor procedures was not rigorously administered.	For "suspect" radiological facilities, issue to DOE for approval an updated hazards assessment document with updated hazard categorization.	BJC/SB5a-114	SB5	August 1, 2002

Table 5.4-2 BJC Corrective Actions for SMP Improvements

DNFSB AREA OF CONCERN: Safety Basis

ISSUE(S): Development, maintenance, and implementation of SB documents has not been managed to consistently assure adequat implementation.

ROOT CAUSE: The DOE-ORO and BJC process and organizational alignment for management of AB documents has not been full integrated, nor well documented.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
	FIRE PROTECTION PROGRAM			
CF/BJCSB-1 Facility safety documents were developed by multiple organizations from multiple prime contractors at five sites over many years to varying standards/procedures with varying DOE expectations, reviewers, and review processes. ***CF/BJCSB-2*** Expectations and requirements with respect to AB and facility hazard document development, maintenance, and implementation have evolved and changed from DOE orders to WSS to 10 CFR 830 Subpart B, while the base documents have remained unchanged. "Old" documents are sometimes reviewed per new standards and found lacking.	Conduct Assessments of FP&EM SMP implementation to supplement SB flowdown. Document results. Define Corrective Actions and enter into I/CATS.	BJC/SA1a-1	SA1a	April 30, 2002
	Conduct facility specific FP SME assessments of combustible loading and ignition controls as determined to be needed based on results from FP SMP Assessments.	BJC/SA1a-2	SA1a	August 30, 2002
	Modify the M&I contract to incorporate DOE Order 420.1, Section 4.2, FP, into BJC contract WSS.	BJC/SA1a-3	SA1a	February 28, 2002 (complete)
	Issue a BJC Policy to describe management commitment to the FP SMP.	BJC/SA1a-4	SA1a	June 30, 2002
	Revise BJC-FP-2001 FP Program Description to incorporate functional direction for combustible loading limitations and controls for ignition sources as well as integration of Fire Hazards Analysis (FHAs) into DSAs, pre-fire planning, emergency response training and drills.	BJC/SA1a-5	SA1a	September 30, 2002
	Develop an integrated DOE-ORO EM/BJC process and DSA guides for management of DSA documents for Category 2 and 3 facilities, consistent with 10 CFR 830 Subpart B requirements and other applicable requirements and standards. (These DSA guides will include an integrated hazards analysis process, and separate guides for Fire Hazards Assessments and EM Hazard Assessments.)	BJC/SA1a-6	SA1a	May 31, 2002

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-10 AB for EM facilities were administered for many years on a decentralized basis without an integrated, central document control and record management process, resulting in difficulties in identifying and assuring completeness of AB documents. While actions have been taken to strengthen the document control and records management process for AB documents, further improvement is needed. ***CF/BJCSB-15*** SMP descriptions in traditional AB document structures (SARs, BIOs, etc.) were not adequately developed and applied to many EM facilities and activities. Many reflected descriptions of program implemented by the previous contractor.	Develop a company-wide procedure for conducting Fire Protection Engineering Assessment (FPEA).	BJC/SA1a-7	SA1a	September 30, 2002
	Evaluate the adequacy of FP requirements in BJC subcontract pro forma and revise pro forma as needed.	BJC/SA1a-8	SA1a	September 30, 2002
	Obtain necessary resources to support FP SME to evaluate and disposition results from SMP assessments regarding combustible loading and ignition controls.	BJC/SA1a-9	SA1a	April 30, 2002
	Develop a GM level Charter for Security, Fire and Emergency Management (SF&EM) Functional Organization describing Roles and Responsibilities.	BJC/SA1a-10 BJC/SA1a-24	SA1a	June 30, 2002
	Reassess the SF&EM Organization and identify FY 2003 budget authority to staff organization for deploying FP program functional personnel to projects.	BJC/SA1a-11	SA1a	June 30, 2002
	EMERGENCY MANAGEMENT PROGRAM			
	Conduct Assessments of FP&EM SMP implementation to supplement SB flowdown. Document Results. Define Corrective Actions and enter into I/CATS.	BJC/SA1a-19	SA1a	April 30, 2002
	Conduct emergency management SME assessments as determined to be needed based on results from EM SMP Assessments.	BJC/SA1a-20	SA1a	August 30, 2002
	Revise the BJC Emergency Management Program Description to include (1) the requirement for BJC Projects to see that occupants of facilities receive training on emergency alarm recognition, evacuation routes, and location of assembly stations, (2) the requirement that an annual building evacuation be conducted, and (3) integration of Emergency Management Hazard Analysis (EMHA) with DSAs into emergency response training and drills.	BJC/SA1a-21	SA1a	June 30, 2002

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Complet
	Develop an integrated DOE-ORO EM/BJC process and DSA guides for management of DSA documents for Category 2 and 3 facilities, consistent with 10 CFR 830 Subpart B requirements and other applicable requirements and standards. (These DSA guides will include an integrated hazards analysis process, and separate guides for Fire Hazards Assessments and Emergency Management Hazard Assessments.)	BJC/SA1a-22	SA1a	May 3
	Obtain necessary resources to support EM SME evaluate and disposition results from EM SMP Assessments.	BJC/SA1a-23	SA1a	April 3
	Develop a GM level Charter for SF&EM Functional Organization describing Roles and Responsibilities (Duplicate #10).	BJC/SA1a-24	SA1a	June 3(
	Reassess the SF&EM Organization and identify FY 2003 budget authority to staff organization for deploying emergency management functional personnel to projects (Duplicate BJC/SA1a-11).	BJC/SA1a-25	SA1a	June 3(
	HAZARDOUS MATERIAL PROTECTION			
	Develop a SMP description for Hazardous Material Protection.	BJC/SA1a-26	SA1a SA1b	April 1(
	Include in ES&H management assessment process provision for conduct of periodic scheduled management assessments of the industrial safety and industrial hygiene programs.	BJC/SA1bA-27	SA1b	March 1 (comp

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
	Conduct assessment of chemical vulnerabilities in conjunctions with the BJC Chemical SMP initiative. This initiative includes following: BJC facilities than have or maintain hazardous materials in quantities greater than the threshold quantities identified in 40 CFR 302 and of facilities with hazard level ≥ 2 as defined by National Fire Protection Association (NFPA) 45.B-2.3 or 49 CFR 173.2, Division 1.1, 1.2, 1.3 or explosives > 45 g of Division 1.4 explosives in one area	BJC/SA1bC-30	SA1b	January 31, 2002 (complete)
	Obtain DOE approval for prioritized chemical vulnerability list.	BJC/SA1bC-31	SA1b	April 2, 2002 (complete)
	CONDUCT OF OPERATIONS PROGRAM			
	Complete a Conduct of Operations SME Qualifications package. The package provides documentation that the SME possesses unique experience and expert knowledge in selected technical, functional, and/or process areas.	BJC/SA1bB-32	SA1b	March 21, 2002 (complete)
	Communicate upcoming "Conduct of Operations" initiative to MOPs and FMs.	BJC/SA1bB-33	SA1b	April 1, 2002 (complete)
	Perform a crosswalk matrix between DOE Order 5480.19 and applicable BJC procedures, policies and pro-forma documents.	BJC/SA1bB-34	SA1b	April 30, 2002
	Develop a Conduct of Operations Program Description Document. The Conduct of Operations Description document will address BJC Standards and expectations, Line management involvement in field activities and the BJC approach for achieving appropriate Rigor in all aspects of worked performed at BJC locations.	BJC/SA1bB-35	SA1b	April 30, 2002

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Complet
	Collect, review and provide feedback on Completed Applicability Matrices submitted by subcontractors to date. Communicate weaknesses and needed changes to affected MOPS and Deputies.	BJC/SA1bB-36	SA1b	April 3
	Develop Conduct of Operations Awareness and orientation materials. Conduct of Operations Awareness session material will include the BJC and DOE expectations for Conduct of Operations and a review of the 18 Conduct of Operations elements. The review will help work groups interpret the intent of each specific Conduct of Operations element and provide assistance on the application of these elements. Key BJC and Subcontractor employees will attend awareness sessions.	BJC/SA1bB-37	SA1b	April 3
	Develop a schedule for delivering Conduct of Operations Awareness sessions to Key BJC and subcontractor personnel at all BJC locations. Schedule will specify names (or positions) of attendees and the date, time and location of each session.	BJC/SA1bB-38	SA1b	April 3
	Deliver "Conduct of Operations" Awareness Sessions to key BJC and subcontractor employees identified on schedule developed in BJC/SA1bB-35.	BJC/SA1bB-39	SA1b	May 1
	Review and revise as necessary BJC procedure BJC-PQ-1710 "Discipline and Rigor In Operating Facilities" to ensure compliance with DOE Order 5480.19 "Conduct of Operations Requirements for DOE Facilities".	BJC/SA1bB-40	SA1b	June 1
	Review and Revise BJC subcontract Pro-Forma documents as necessary to flow-down applicable Conduct of Operations Requirements to subcontractors.	BJC/SA1bB-41	SA1b	June 1

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
	Lead and Assist BJC projects and subcontractors during the Conduct of Operations Applicability Matrix Review and development of Conduct of Operations Improvement Plans. This specialized assistance will assure that a graded approach is used in the application of Conduct of Operations Principles to assure that the depth of detail required and extent of dollars expended are commensurate with the project's programmatic importance and potential ES&H impact.	BJC/SA1bB-42	SA1b	July 20, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-43	SA1b	July 31, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-44	SA1b	July 31, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-45	SA1b	July 31, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-46	SA1b	July 31, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-47	SA1b	July 31, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-48	SA1b	July 31, 2002
	Review and approve each completed Conduct of Operations Applicability Matrix for subcontractors and self-performed projects within the MOP area of responsibility.	BJC/SA1bB-49	SA1b	July 31, 2002

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
	Assess Conduct of Operations effectiveness. A Performance-based evaluation of ongoing activities will be conducted to determine if appropriate levels of rigor are being successfully applied to BJC Work activities.	BJC/SA1bB-50	SA1b	August 15, 2002
	Determine a method for tracking Applicability Matrix actions to closure.	BJC/SA1bB-51	SA1b	June 1, 2002
	Develop a process and Track "Conduct of Operations" performance measures.	BJC/SA1bB-52	SA1b	July 20, 2002
	Conduct an integrated Conduct of Operations/ISM assessment.	BJC/SA1bB-53	SA1b	November 8, 2002
	DRUM OVERPRESSURIZATION			
	Suspend Waste Disposition Project drum handling opening activities as a result of two over pressurized waste containers.	BJC/SA1a-57	SA2a	January 28, 2002 (complete)
	Modify subcontractor-operating procedures to require: lid-retaining webs to be used for opening any non-vented open top drums. Drums in storage containing transuranic (TRU) waste were evaluated and determined to have High Efficiency Particulate Air (HEPA) filters installed to prevent over pressurization.	BJC/SA1a-58	SA2a	February 18, 2002 (complete)
	Evaluate waste characterization data (Form 2109s) for waste matrices that exhibit gas generation potential. For drums that are found to exhibit gas generation potential, prepare specific Activity Hazards Analysis (AHAs) prior to opening.	BJC/SA2a-59	SA2a	February 18, 2002 (complete)
	Implement a safety stand down for all projects to review hazard controls for opening of waste containers.	BJC/SA2a-60	SA2a	February 8, 2002 (complete)

Table 5.4-2 BJC Corrective Actions for SMP Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completi
	Add evaluation of waste matrices to hazard screenings in SB documents.	BJC/SA2a-61	SA2a	May 31,
	Ensure open-top drum handling and opening requirements are consistent for all subcontractors performing these activities for BJC organizations that may perform these activities. [I/CATS 5030]	BJC/SA2a-62	SA2a	May 31,
	Ensure a process is in place to ensure corrective measures are instituted to address bulging/over-pressurized drums identified by any BJC organization or their subcontractor(s). [I/CATS 5031]	BJC/SA2a-63	SA2a	June 14,
	OTHER CORRECTIVE ACTIONS			
	Thirty-seven of 40 corrective actions have been completed. The remaining actions are being tracked in I/CATS and are tied to implementation of the Facility Authorization Tool-Container Analysis Tool (FATCAT) database. BJC has a NCS implementation plan and is on track to complete all actions by the close of FY 2002.	BJC/SA1a-16	SA1a	September
	Completed (R/CAAS TSR) February 12, 2002, DOE SER issued with "no conditions of approval."	BJC/SA1a-17	SA1a	February 1 (compl
	Perform root cause analysis and determine corrective action(s).	BJC/SA3a-64	SA3a	November (compl
	Submit update to NTS report to reflect information from SB flowdown assessments and DOE HQ AB review with expanded corrective actions.	BJC/SA3a-68	SA3a	April 12
	Develop standard SMP descriptions.	BJC/MG3d-71 BJC/SB4b-111	MG3d SB4b	May 1,

Table 5.4-3 BJC Corrective Actions for SB Process Improvements

DNFSB AREA OF CONCERN: Safety Basis

ISSUE(S): Development, maintenance, and implementation of SB documents has not been managed to consistently assur implementation.

ROOT CAUSE: The DOE-ORO and BJC process and organizational alignment for management of AB documents has not integrated, nor well documented.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completi
CF/BJCSB-1 Facility safety documents were developed by multiple organizations from multiple prime contractors at five sites over many years to varying standards/procedures with varying DOE expectations, reviewers, and review processes. ***CF/BJCSB-2*** Expectations and requirements with respect to AB and facility hazard document development, maintenance, and implementation have evolved and changed from DOE orders to WSS to 10 CFR 830 Subpart B, while the base documents have remained unchanged. "Old" documents are sometimes reviewed per new standards and found lacking.	Assign the Nuclear Facility Safety Functional Manager to report to the Deputy General Manager.	BJC/MG5c-76	MG5c	December (compl
	Implement a SB Review Board	BJC/MC3-1	NA	December (compl

Table 5.4-3 BJC Corrective Actions for SB Process Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completio
CF/BJCSB-3 Traditional AB document structures (SARs , BIOs etc.) and associated safety analysis requirements, e.g., natural phenomena, were developed/designed for operating facilities and have not been "readily applicable" to many EM facilities (shutdown, inactive facilities, burial grounds, contaminated sites, etc.) and activities (facility S&M, environmental remediation, D&D, etc.). Many of these issues will be resolved as documents are updated to 10 CFR 830, Subpart B, Safe Harbor Methodology. ***CF/BJCSB-4*** In some instances, the technical basis supporting AB documents is not clearly documented and does not meet current expectations. ***CF/BJCSB-5*** Updating AB documents has been viewed by some DOE, BJC, and subcontractor personnel to be lesser importance for some EM facilities due to their shutdown, inactive status and planned disposition, resulting in a lack of rigor in AB management and implementation. ***CF/BJCSB-6*** While AB documents, i.e., SARs and BIOs, have been maintained via the USQD process, periodic updates/revisions have not been processed, resulting in some AB documents having numerous USQDs and being difficult to understands, implement, and utilize.				
	Establish a joint BJC/DOE-ORO SB Working Group.	BJC/MG5c-77	MG5c	February 1 (compl
	Obtain DOE-ORO approval of BJC USQD procedure and issue procedure.	BJC/MG9a-89	MG9a	May 30,
	Conduct an independent review of the AB management process/program to assess its technical adequacy and to more clearly identify areas needing improvement.	BJC/MC4-1	NA	March 1, (compl

Table 5.4-3 BJC Corrective Actions for SB Process Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completi
CF/BJCSB-8 The M&I contract did not require formal updates to AB documents as a part of contract transition. Additionally, the BJC contract transition plan did not include provisions for formal AB document revisions to bring documents up-to-date for new prime contract conditions. Document updates were made via the USQD process.	Develop and issue BJC Nuclear Safety Assurance Policy to clarify expectations and to further define roles and responsibilities.	BJC/MG3d-70 BJC/MG4a-72 BJC/MG5c-75	MG3d MG4a MG5c	April 1,
CF/BJCSB-9 The basis for facility categorization developed by the prior prime contractor, has not been maintained current, and have not been well understood by DOE-ORO and BJC managers. Although the due diligence report submitted by BJC in October 1998 identified that the AB documents had been prepared by the prior contract and not BJC, DOE-ORO EM and BJC relied on the adequacy of those documents for continued EM activities.	Develop an integrated DOE-ORO EM/BJC process flowchart and DSA guides for management of DSA documents for Category 2 and 3 facilities, consistent with 10 CFR 830 Subpart B requirements and other applicable requirements and standards	BJC/SA1a-6 BJC/SA1a-22 BJC/MG11-92 BJC/SB1a-98 BJC/SB4b-110 BJC/SB6a-115	SA1a MG11 SB1a SB4b SB6a	May 31,
CF/BJCSB-10 AB for EM facilities were administered for many years on a decentralized basis without an integrated, central document control and record management process, resulting in difficulties in identifying and assuring completeness of AB documents. While actions have been taken to strengthen the document control and records management process for AB documents, further improvement is needed.	Define and implement additional improvements to the document control and records management system for AB documents.	BJC/MG5c-80 BJC/SB1b-100	SB1b MG5c	March 21 (comp

Table 5.4-3 BJC Corrective Actions for SB Process Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completic
CF/BJCSB-11 The DOE-ORO and BJC processes for administering AB documents has not been effective in managing interfaces. There was a lack of a consistent interface protocol, i.e., AB document submittals were from multiple points in BJC to multiple points in DOE-ORO EM, resulting in "lost" documents and difficulties in DOE tracking, review, and approval. *CF/BJCSB-12* DOE-ORO lacked a defined organization, process, and procedures for consistently administering and managing the AB process, documents, and reviews. In some cases, communications between BJC and DOE-ORO have not been effective to assure timely resolution of AB-related issues and comments.				
	Develop new BJC hazard identification, facility categorization, and inventory control procedure/document, compliant with governing standards.	BJC/SA1a-12 BJC/SB5a-112	SA1d SB5a	July 1,
	Revise BJC-NS-1002 to include joint DOE and BJC DSA review points.	BJC/MG11-93 BJC/MG11-94	MG11	July 1,
	Develop corporate level DSA application guides for use in development of 10 CFR 830 compliant DSAs and graded safety documents for less than category 3 facilities.	BJC/SB2a-102 BJC/SB3d-108 BJC/SB4b-109	SB2a SB3d SB4b	May 31,

Table 5.4-3 BJC Corrective Actions for SB Process Improvements (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-15 SMP descriptions in traditional AB document structures (SARs, BIOs, etc.) were not adequately developed and applied to many EM facilities and activities. Many reflected descriptions of program implemented by the previous contractor.	Revise and issue proforma contract Exhibit E to make BJC procedures for Nuclear Safety and NCS mandatory for subcontractors. Issue directed change to subcontractors responsible for Category 2 and 3 Facilities to comply with the new Nuclear Safety Technical Specification, Exhibit E-1.	BJC/MG4b-74 BJC/MG9a-90 BJC/MG9a-91 BJC/MG11-95 BJC/MG11-96	MG4b MG9a MG11	July 1, 2002 July 1, 2002 September 30, 2002 July 1, 2002 July 1, 2002
CF/BJCSB-16 BJC and subcontract managers were not held accountable in rigorously exercising nuclear safety roles, responsibilities, and authorities in facilities many of which had transitioned from their original missions to S&M without approved updates to the SB documents.	Develop standard SMP descriptions.	BJC/MG3d-71 BJC/SB4b-111	MG3d SB4b	May 1, 2002
CF/BJCSB-17 BJC and subcontractors have not implemented a uniform set of requirements in the respective USQD process documents.				
CF/BJCSB-18 The flow-down of SB requirements into BJC and subcontractor procedures was not rigorously administered.	Update BJC performance review process for line managers to include evaluation criteria for nuclear safety.	BJC/MG4a-73	MG4a	July 31, 2002

Table 5.4-4 BJC Corrective Actions for SB Updates and Upgrades

DNFSB AREA OF CONCERN: Safety Basis

ISSUE(S): Development, maintenance, and implementation of SB documents has not been managed to consistently implementation.

ROOT CAUSE: The DOE-ORO and BJC processes and organizational alignment for management of AB documents ha integrated, nor well documented.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Con
CF/BJCSB-2 Expectations and requirements with respect to AB and facility hazard document development, maintenance, and implementation have evolved and changed from DOE orders to WSS to 10 CFR 830 Subpart B, while the base documents have remained unchanged. "Old" documents are sometimes reviewed per new standards and found lacking.				
	Establish a joint BJC-DOE-ORO SB Working Group.	BJC/MC5c-77	MG5c	Febr (
CF/BJCSB-3 Traditional AB document structures (SARs , BIOs etc.) and associated safety analysis requirements, e.g., natural phenomena, were developed/designed for operating facilities and have not been "readily applicable" to many EM facilities (shutdown, inactive facilities, burial grounds, contaminated sites, etc.) and activities (facility S&M, environmental remediation, D&D, etc.). Many of these issues will be resolved as documents are updated to 10 CFR 830, Subpart B, Safe Harbor Methodology.				
	Generic technical issues associated with DSA development will be addressed by the joint BJC/DOE SB Working Group, with guidance documents issued regarding DSA development as determined to be needed. This guidance will supplement the DSA guides being developed.	BJC/SB2b-104	SB2b	Septe
CF/BJCSB-4 In some instances, the technical basis supporting AB documents is not clearly documented and does not meet current expectations.				

Table 5.4-4 BJC Corrective Actions for SB Updates and Upgrades (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-5 Updating AB documents has been viewed by some DOE, BJC, and subcontractor personnel to be lesser importance for some EM facilities due to their shutdown, inactive status and planned disposition, resulting in a lack of rigor in AB management and implementation. ***CF/BJCSB-6*** While AB documents, i.e., SARs and BIOs, have been maintained via the USQD process, periodic updates/revisions have not been processed, resulting in some AB documents having numerous USQDs and being difficult to understands, implement, and utilize. ***CF/BJCSB-7*** DOE and BJC have been reluctant to expend resources to update AB document for shutdown, inactive facilities planned for demolition/disposition/remediation. ***CF/BJCSB-8*** The M&I contract did not require formal updates to AB documents as a part of contract transition. Additionally, the BJC contract transition plan did not include provisions for formal AB document revisions to bring documents up-to-date for new prime contract conditions. Document updates were made via the USQD process.				
	Develop a Paducah CAP and basis for remediation of NCS restricted areas in C-410.	BJC/SB1a-99	SB1a	March 12, 2002 (complete)
	Submit updated BJC 10 CFR 830 Implementation Plan to DOE.	BJC/SA3a-67 BJC/SB3b-106 BJC/MG5c-78 BJC/SB2a-103 BJC/SB3c-107	SA3a SB3b MB5c SB2a	April 10, 2002 (complete)
	Complete annual update for Authorization Agreements	BJC/MC5-1	NA	May 31, 2002

Table 5.4-4 BJC Corrective Actions for SB Updates and Upgrades (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCSB-9 The basis for facility categorization developed by the prior prime contractor, has not been maintained current, and have not been well understood by DOE-ORO and BJC managers. Although the due diligence report submitted by BJC in October 1998 identified that the AB documents had been prepared by the prior contract and not BJC, DOE-ORO EM and BJC relied on the adequacy of those documents for continued EM activities ***CF/BJCSB-11*** The DOE-ORO and BJC processes for administering AB documents has not been effective in managing interfaces. There was a lack of a consistent interface protocol, i.e., AB document submittals were from multiple points in BJC to multiple points in DOE-ORO EM, resulting in "lost" documents and difficulties in DOE tracking, review, and approval.	For all BJC Category 3 facilities, issue to DOE for approval an updated hazards assessment document with updated basis for hazard categorization.	BJC/SB5a-113	SB5	April 10, 2003
	For "suspect" radiological facilities, issue to DOE for approval an updated hazards assessment document with updated basis for hazard categorization.	BJC/SB5a-114	SB5	August 1, 2002
	Annual updates and/or 10 CFR 830 compliant upgrades are being processed to achieve compliance with the requirements of 10 CFR 830 Subpart B.	BJC/SB3a-105	SB3a	April 10, 2003

5.2 DOE ORDERS OF INTEREST

Both the DNFSB letter and the DOE-HQ Independent Assessment identified the need to re-evaluate the BJC contract WSS against other DOE nuclear safety requirements. DOE-ORO and BJC initiated a review of the WSS contract requirements focusing on the 109 directives specified in the DNFSB letter. The initial review indicated that several applicable nuclear safety directives should be added to the contract. In a February 28, 2002 letter to DOE-ORO, BJC identified the following four directives for immediate incorporation into the contract via a Type 1 WSS revision:

- DOE O 420.1, Change 3, Facility Safety Section 4.2, Fire Protection (FP)
- DOE O 5480.19, Change 1, Conduct of Operations Requirements for DOE Facilities
- DOE O 5480.20A, Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities
- DOE-STD-1120-98, Integration of Environment, Safety and Health (ES&H) into Facility Disposition Activities

Concurrent with the above activity DOE-ORO and BJC completed a review of the remaining directives. As a result of the review DOE requested a Type 1 WSS revision for 17 directives and a Type 2 WSS Revision for 4 directives. The following is a listing of the specific orders.

Type 1 WSS Revision Listing

- DOE O 151.1A – Comprehensive Emergency Management Plan
- DOE O 210.1, Change 2 – Performance Indicators and Analysis of Operations Information
- DOE O 225.1A - Accident Investigations
- DOE O 231.1, Change 2 – ES&H Reporting
- DOE O 414.1A, Change 1 – Quality Assurance
- DOE O 425.1B – Startup and Restart of Nuclear Facilities
- DOE O 440.1A – Worker Protection Management
- DOE O 5400.1, Change 1 - General Environmental Protection Program
- DOE O 5400.5, Change 2 – Radiation Protection of the Public and Environment
- DOE P 441.1 – Radiological Protection for DOE Activities
- DOE P 450.2A – Identifying, Implementing, and Complying with ES&H Requirements
- DOE P 450.3 – Authorizing Use of the Necessary and Sufficient Process for Standards-Based ES&H
- DOE P 450.5 – Line ES&H Oversight
- DOE P 450.6 – Secretarial Policy Statement on ES&H
- 10 CFR 830 Subpart A – Quality Assurance Requirements
- 10 CFR 830 Subpart B – Nuclear Safety Management
- DOE O 420.1, Change 3, Section 4.4 - Facility Safety – Natural Phenomena Hazards Mitigation

Type 2 WSS Revision Listing

- DOE O 433.1 – Maintenance Management Program for DOE Nuclear Facilities
- DOE O 460.1A – Packaging and Transportation Safety
- DOE O 460.2 – Departmental Materials Transportation and Packaging Management
- DOE O 5480.4 – Environmental Protection, Safety and Health Protection Standards

In addition, an assessment of the WSS change process was initiated to evaluate the focus on assessments against contractual requirements to the exclusion of DOE requirements.

The flow diagram in Figure 5.2 outlines the general approach following in reviewing the orders of interest.

5.2.1 DOE Corrective Actions

DOE corrective actions are summarized in Table 5.5. Appendix A provides further detail for these corrective actions.

5.2.2 BJC Corrective Actions

BJC corrective actions are summarized in Table 5.6. Appendices B and C provide further detail for these corrective actions.

Figure 5.2 Evaluation of Orders of Interest

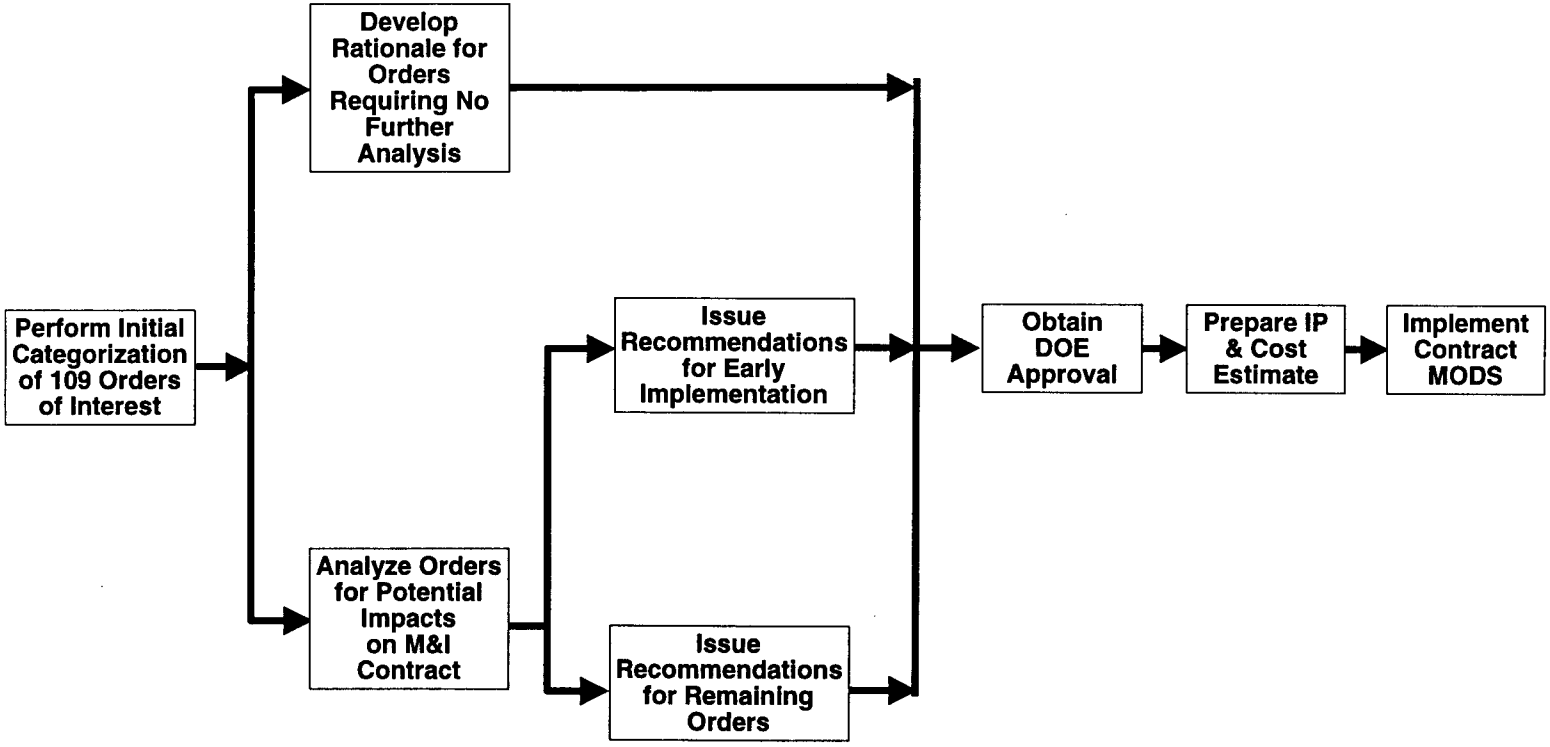

Table 5.5 ORO Corrective Actions for WSS

DNFSB AREA OF CONCERN: Orders of Interest

ISSUE(S): DOE Orders of Interest important to nuclear safety were not included as requirements in the M&I contract WSS.

ROOT CAUSE(S): The belief that the nuclear safety risks for the BJC work were not significant.

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completio
CF/ORSB-1 Exclusion of applicable DOE nuclear safety requirements in the BJC contract. ***CF/OROI-1*** Belief that nuclear safety risks were not significant for BJC work. ***CF/OROI-2*** 10 CFR 830, Subpart B, SB Requirements did not exist. ***CF/OROI-3*** No formal consequences for omitting nuclear safety requirements from the WSS. ***CF/OROI-4*** DOE Manual 450.3-1 *The DOE Closure Process for Necessary and Sufficient Sets of Standards* allows omission without formal justification.	Re-evaluate the existing BJC WSS set.	OR/MG6-1	MG6	March 29, (compl
	Modify the BJC WSS set, as appropriate.	OR/MG6-2	MG6	December (
	Determine adequacy of ORO WSS development process and implement any necessary upgrades.	OR/MG6-3	MG6	May 31,
	Ensure incorporation of DOE O 420.1 in BJC WSS, as appropriate.	OR/SB7-1	SB7	March 29, (compl

Table 5.6 BJC Corrective Actions for WSS

DNFSB AREA OF CONCERN: Orders of Interest

ISSUE(S): DOE Orders of Interest important to nuclear safety were not included as requirements in the M&I contract WSS.

ROOT CAUSE: The WSS process failed to identify an adequate set of nuclear safety standards.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Comple
CF/BJCOI-1 Lack of a process to periodically evaluate the completeness of the WSS to accomplish the BJC scope. ***CF/BJCOI-2*** BJC assessments did not identify gaps related to DOE nuclear safety directives.	Review 109 orders of interest to DNFSB against BJC contract and submit to DOE.	BJC/MG6a-82	MG6a	Februar (con
	Submit Type 1 WSS revisions for applicable WSS sets based on the recommendations forwarded via 2 BJC letters dated 2/28/02 and DOE letter dated 3/8/02.	BJC/MG6a-83	MG6a	March (con
	Submit Type 2 WSS revision for applicable WSS sets based on the recommendations forwarded via 2 BJC letters dated 2/28/02 and DOE letter dated 3/8/02.	BJC/MG6a-84	MG6a	April
	Perform management assessment of the WSS process and prepare CAP by 6/30/02.	BJC/MG6a-85	MG6a	June 3
	Submit implementation plan to DOE.	BJC/MG6a-86	MG6a	August
	Modify the M&I contract to incorporate DOE Order 420.1, Section 4.2, FP, into BJC contract WSS.	BJC/SA1a-3	SA1a	Februar (con

5.3 TECHNICAL COMPETENCE

As discussed in Section 2.7, BJC conducted a baseline assessment of the qualifications program for nuclear facility personnel, "Management Assessment Report, BJC Nuclear Facilities Qualification Program," MA-02-HR-SP-001, January 15, 2002. Training and qualifications issues were also raised by the DNFSB staff, by the DOE-HQ Independent Assessment, in the NTS report, NTS-ORO-BJC-BJCPM-2001-0004, and in the ISMS OFI.

The flow diagram presented in Figure 5.3 outlines the general approach BJC utilized in the training and qualification program improvement process. The causal factors were discussed in Section 4.0 of this report.

Subsequent to the baseline management assessment, an analysis was performed to determine areas needing improvement in the existing qualification programs. This analysis focused on key positions within the BJC nuclear facilities. The analysis resulted in the development of new training requirements and additional training courses. The management assessment also identified the need to better define the qualification requirements of key subcontractor positions.

An evaluation of the staffing for nuclear facility safety personnel identified the need for additional nuclear safety technical staff.

Corrective actions were developed to address findings and recommendations. These actions include addition of the DOE Training Order 5420.2a, "Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities," to the BJC contract WSS.

5.3.1 DOE

DOE-ORO has determined that there is insufficient staff expertise to effectively exercise nuclear safety management responsibilities in the EM program. Further, the ORO NSD has experienced staffing losses, which have impacted the ability to support SB reviews and approvals. In addition to staff augmentation DOE-ORO has instituted some training programs to improve the knowledge of EM program managers responsible for nuclear facilities.

Corrective actions are summarized in Table 5.7. Appendix A provides further detail for these actions.

5.3.2 BJC Technical Competence Corrective Action and Improvements

Corrective actions are summarized in Table 5.8. Appendices B and C provide further detail for these actions.

Figure 5.3 Training & Qualification Improvements Process

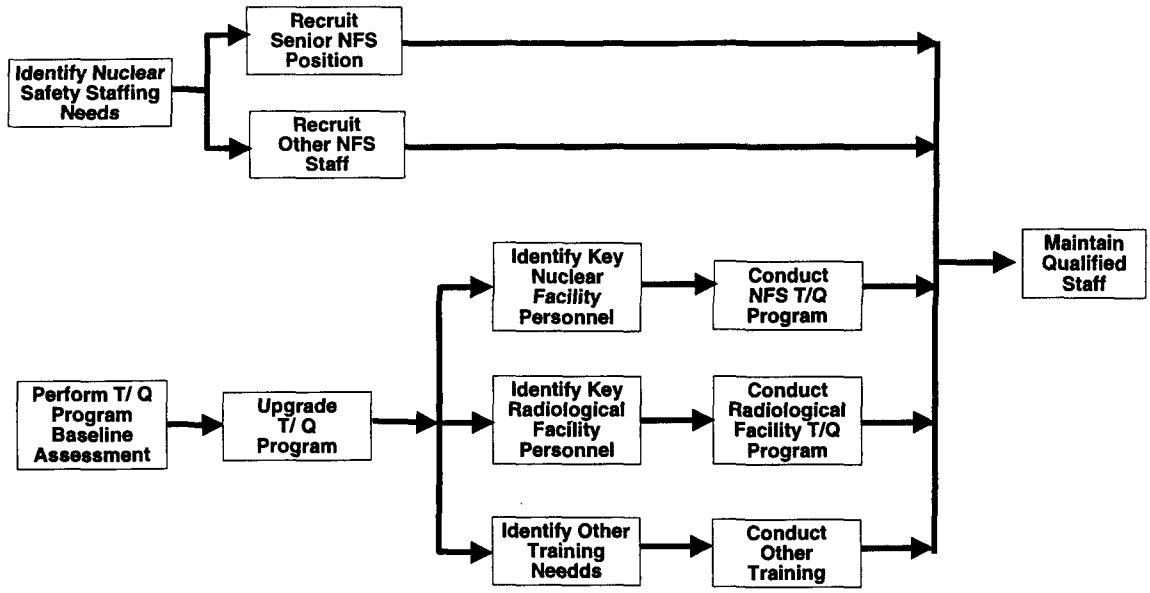

Table 5.7 ORO Corrective Actions for Technical Competence

DNFSB AREA OF CONCERN: Technical Competence

ISSUE(S): Inadequate technical expertise in ORO to manage the SB for nuclear facilities.

ROOT CAUSE(S):

- The belief that the nuclear safety risks for the BJC work were not significant.
- Lack of management accountability and consequences for not having approved SB documents.

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/ORTC-1 ORO-wide staffing reductions and hiring limitations due to budget cuts. ***CF/ORTC-2*** Staff changes in NSD. Positions were lost along with people. Two people retired, two promoted, and two made lateral position moves.	Interim: Use details and support service contractors to augment staff while defining ORO SB process and evaluating work load based on process.	OR/MG2-1	MG2	April 30, 2002
	Reevaluate staffing analysis based on current organizational expectations for AMEM, AMESH, AML, and AMAU.	OR/MG2-2 OR/MG2-3 OR/MG2-4 OR/MG2-5	MG2	May 31, 2002
	Make sufficient qualified staffing available and develop contingency plan if minimum staffing is not achievable.	OR/MG2-6	MG2	November 1, 2002
	Include periodic SB program assessments in an ORO Annual Assessment Plan	OR/MG7-1	MG7	May 31, 2002
	Conduct an assessment of the EM FR program.	OR/MG7-2	MG7	April 12, 2002
	Conduct an assessment of ORNL FR program.	OR/MG7-3	MG7	June 14, 2002
	Provide recommendations for formalization of an ORO FR program.	OR/MG7-4	MG7	June 17, 2002

Table 5.7 ORO Corrective Actions for Technical Competence (continued)

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/ORTC-3 When people leave corporate knowledge and experience is lost. Cannot hire new person until after other person has left. ***CF/ORSB-5*** Insufficient technical capabilities for development, review, and management of SB documents. ***CF/ORSB-7*** DOE technical support contractors used trainees and unqualified staff to prepare SB documents.	Decide on desired changes relative to the ORO FR program.	OR/MG7-5	MG7	July 1, 2002
	Implement desired changes relative to the ORO FR program	OR/MG7-6	MG7	July 30, 2002
	Review and approve BJC USQD procedure and submit to HQ.	OR/MG9-1	MG9	May 1, 2002
	Verify use and effectiveness of USQD procedure by BJC and subcontractors.	OR/MG-9-2	MG9	December 1, 2002
	Conduct training needs analysis to identify personnel in need of SB knowledge (M-1 through organization)	OR/MG10-1	MG10	April 10, 2002
	Incorporate SB competency into Training and Qualifications Program (TQP) Office/Facility Specific Standards.	OR/MG10-2	MG10	April 30, 2002
	Define process for obtaining approval of qualification.	OR/MG10-3	MG10	May 31, 2002
	Review/update applicable position descriptions in AMEM, AML, AMAU, and AMESH.	OR/MG10-4 OR/MG10-5 OR/MG10-6 OR/MG10-7	MG10	May 10, 2002

Table 5.8 BJC Corrective Actions for Technical Competence

DNFSB AREA OF CONCERN: Technical Competence

ISSUE(S):

- Sufficient technical expertise is not in place to accomplish responsibilities required by the SB for nuclear facilities.
- A rigorous program has not been maintained to ensure that competencies are commensurate with roles and responsibilities.

ROOT CAUSE: The BJC training and qualification for personnel involved in nuclear facility operations did not meet the expectations of DOE 5480.20A, which was not included in the BJC contract.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCTC-1 The lack of minimum qualification requirements permitted some personnel to be placed in positions of responsibility who did not have the requisite background and experience with the facility safety documents and the associated controls.				
	Identify critical positions supporting BJC Nuclear Facilities.	BJC/SA1a-15a	SA1a	March 18, 2002 (complete)
CF/BJCTC-2 The lack of established minimum acceptable staffing levels allowed the transition between DOE prime contractors to occur with less than sufficient technical staffing and resources to support nuclear facility management or SB responsibilities.				
	Develop qualification requirements based on the identified roles and responsibilities for nuclear facility positions.	BJC/SA1a-15b	SA1a	April 15, 2002
CF/BJCTC-3 Standards, policies, and procedures for staffing nuclear facilities were incomplete. In particular, the absence of standards in the area of personnel selection, training, and qualification created the shortcomings in technical competence.				
	Upgrade training position descriptions with the roles and responsibilities for BJC nuclear facility critical positions.	BJC/SA1a-15c	SA1a	April 25, 2002

Table 5.8 BJC Corrective Actions for Technical Competence (continued)

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Comp
CF/BJCTC-4 At the time of prime contract transition, BJC did not formally verify and document qualification of nuclear facility staff in terms of education, experience, previous qualifications, and job related training.	Complete the required training and qualification documentation for nuclear facility critical positions.	BJC/SA1a-15d	SA1a	Jun
CF/BJCTC-5 The reliance on industry standards for the establishment of qualification requirements contributed to failure, in some cases, to establish sufficient requirements based job responsibilities.	Complete baseline training and qualification improvements. (Includes incorporation of DOE Training Order 5480.20A in BJC contract)	BJC/MG8a-87	MG8a	Octo
CF/BJCTC-6 The process for the establishment of training and qualification requirements based on an analysis of the job requirements lacked formality.				
CF/BJCSB-13 BJC has not established minimum qualification requirements for personnel in facility management positions for nuclear category 2 and 3 facilities. ***CF/BJCSB-14*** In some cases DOE-ORO EM, BJC, and subcontractor personnel with facility management responsibility for AB development and implementation have not been sufficiently familiar with AB documents, requirements, and implementation.	Conduct analysis of BJC nuclear safety staffing needs and initiate staffing actions.	BJC/MG8a-88	MG8a	Febru (c

5.4 ISMS CORRECTIVE ACTIONS

Declaration of ISMS implementation within ORO was deemed to be premature. Consequently, ORO ISMS Verification status was revoked by the Operations Office Manager on November 1, 2001. In February 2002, a task team was chartered to develop and facilitate implementation of: 1) an ORO Federal ISMS Program (ECD 12/02); 2) an improved methodology for conducting verification and oversight of contractor ISMS programs (ECD 9/02); and 3) an improved mechanism to write ISMS "end state attributes" into contract provisions and performance metrics (ECD 5/02).

The FY 2000 DOE ISMS verification had identified OFIs for DOE-ORO and BJC. BJC then developed and implemented corrective actions for the OFIs. An assessment of the OFI corrective actions determined that many actions had not achieved the desired results. ISMS reviews, using both internal and external resources, identified other areas requiring management attention. Based on the causal analysis described in Section 3.0, corrective actions have been identified to address the ISMS Improvements. Figure 5.3, illustrates the BJC corrective action implementation approach.

5.4.1 DOE ISMS Corrective Actions

Corrective actions are summarized in Table 5.9. Appendix A provides further detail for these actions.

5.4.2 BJC ISMS Corrective Actions

Corrective actions are summarized in Table 5.10. Appendices B and C provide further detail for these actions.

Figure 5.4 BJC ISMS Improvements

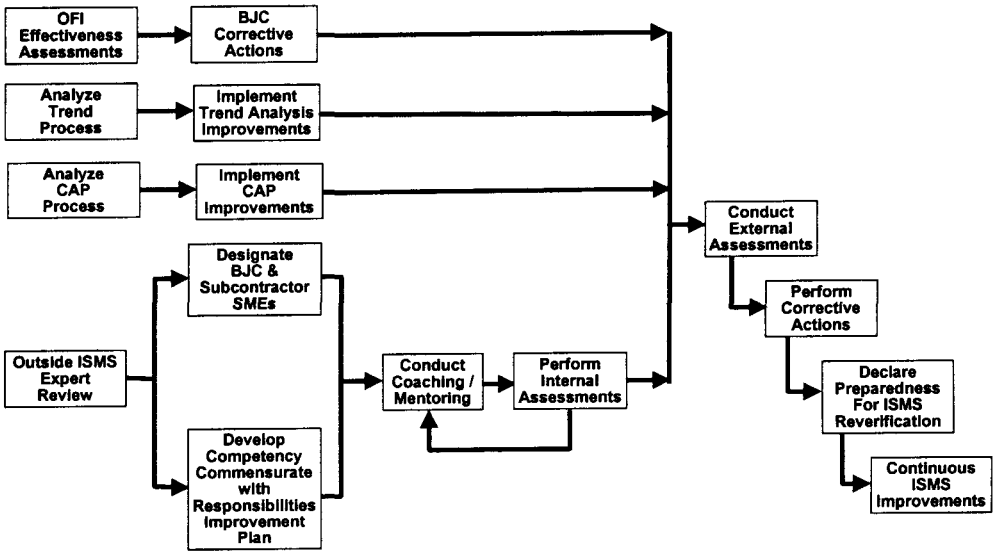

Table 5.9 ORO Corrective Actions for ISMS Improvements

DNFSB AREA OF CONCERN: ISMS

ISSUE(S): Declaration of ISMS verification may have been premature.

ROOT CAUSE(S): Lack of management priority and accountability for closing the ISM system deficiencies.

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/ORIS-1 No centralized ORO CAT and reporting system to bring open issues to management's attention and ensure closeout of ISM System verification findings. ***CF/ORIS-2*** No performance standards were set for successful completion.	Issue ORO dispute resolution process.	OR/MG3-1	MG3	May 31, 2002
	Assign resources to issues management system (IMS) development team.	OR/MG3-2	MG3	April 4, 2002 (complete)
	Define IMS requirements.	OR/MG3-3	MG3	May 2, 2002
	Procure/develop software.	OR/MG3-4	MG3	July 11, 2002
	Document ORO issues management process.	OR/MG3-5	MG3	July 25, 2002
	Train personnel on IMS use.	OR/MG3-6	MG3	September 9, 2002
	Issue ORO IMS process.	OR/MG3-7	MG3	September 30, 2002
	Populate IMS with AMEM, AMESH, AMAU, and AML data.	OR/MG3-8 OR/MG3-9 OR/MG3-10 OR/MG3-11	MG3	November 1, 2002

Table 5.9 ORO Corrective Actions for ISMS Improvements (continued)

Contributing Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/ORIS-3 Unclear who was accountable for the ISMS. ***CF/ORIS-4*** Lack of management priority and accountability for closing the findings.	Close out open CATS items regarding criticality safety.	OR/SB4-5	SB4	November 1, 2002
	Conduct additional analysis of selected ORO processes to identify any changes in business practices necessary to prevent problems similar to those observed in ORO SB activities.	ORRC1-1	No	July 1, 2002
	Institute an ORO root cause analysis process that is automatically invoked when a problem or deficiency of appropriate significance is identified.	ORRC2-1	No	July 1, 2002
	Develop and issue performance standards for ISMS implementation and verification.	ORRC3-1	No	September 30, 2002
	Charter an ORO ISMS Advisory Committee to assist the Ops Office Manager in maintaining the ORO ISMS.	ORRC4-1	No	November 10, 2002
	Adopt a process for routinely bringing open issues and actions to management attention (see MG-4).	ORRC5-1	No	July 1, 2002
	Develop an ORO Federal ISMS Program.	ORRC6-1	No	October 1, 2002
	Implement ORO Federal ISMS Program.	ORRC6-2	No	March 1, 2003
	Conduct a self-assessment of ORO Federal ISMS Program implementation.	ORRC6-3	No	April 20, 2003
	Commission an independent verification of ORO Federal ISMS Program implementation.	ORRC6-4	No	June 15, 2003
	Commission an independent verification of BJC ISMS.	ORRC7-1	No	November 30, 2002

Table 5.10 BJC Corrective Actions for ISMS Improvements

DNFSB AREA OF CONCERN: ISMS

ISSUE(S):

- Feedback and improvement process has not been fully effective to ensure an expected degree of ISMS maturity.
- ISMS implementation by BJC failed to adequately assure ongoing effectiveness and continuous improvement.

ROOT CAUSE: The maintenance of ISMS was not effective.

Causal Factors	Corrective Action Description	Corrective Action Number	DOE-HQ IA Reference(s)	Completion Date
CF/BJCIS-1 OFI corrective actions were not effective in some areas. ***CF/BJCIS-2*** Issue closure process for ISMS corrective actions did not adequately assess effectiveness. ***CF/BJCIS-3*** Analysis/trending of performance data was not effective in identifying improvement opportunities. ***CF/BJCIS-4*** Roles, responsibilities, and structure for SMEs were not clearly defined. ***CF/BJCIS-5*** Indicators of ISMS weaknesses were not synthesized to enable detection of overall program deficiencies in some areas. ***CF/BJCIS-6*** Lack of rigor in enforcing field implementation of existing requirements.	Conduct assessment of the effectiveness of OFI corrective actions.	BJC/IS.1-1	No	February 1, 2002 (complete)
	Develop and implement an OFI CAP.	BJC/IS.1-2	No	May 1, 2002
	Complete an evaluation of the BJC Issues Management trend analysis Process using Six Sigma.	BJC/IS.1-3	No	April 15, 2002
	Issue Trend Analysis CAP.	BJC/IS.1-4	No	May 10, 2002
	Complete an INPO assessment of the BJC corrective action process.	BJC/IS.1-5	No	April 30, 2002
	Issue INPO CAP.	BJC/IS.1-6	No	May 24, 2002
	Conduct outside expert reviews of ISMS implementation.	BJC/IS.2-1	No	August 16, 2002
	Evaluate ISM progress on BJC projects.	BJC/IS.2-2	No	August 30, 2002
	Develop SME program and issue new and/or revised BJC procedures, as appropriate.	BJC/IS.2-3	No	August 30, 2002
	Develop and issue BJC SME Program Management Description document.	BJC/IS.2-4	No	August 30, 2002
	Ensure appointment by Functional Managers of BJC SME.	BJC/IS.2-5	No	April 30, 2002