

**Management Self-Assessment
Report for the Building 4501
Depressurization of Sodium Fluoride
Traps Containing Uranium from the
Molten Salt Reactor Experiment at Oak
Ridge National Laboratory, Oak Ridge,
Tennessee**

October 25, 2002

MANAGEMENT SELF-ASSESSMENT REPORT
for the
BUILDING 4501 DEPRESSURIZATION OF SODIUM FLUORIDE TRAPS
CONTAINING URANIUM FROM THE MOLTEN SALT REACTOR EXPERIMENT

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October 25, 2002

Approved: _____
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Date: _____

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ACRONYMS

AA	Authorization Agreement
ALARA	As Low As Reasonably Achievable
ATS	Assessment Tracking System
CAM	Continuous Air Monitor
CCB	Configuration Control Board
CI	Configuration Item
COA	Conditions of Approval
COO	Conduct of Operations
CP	Conversion Project
CR	Core Requirement
CRAD	Criteria and Review Approach Document
CTD	Chemical Technology Division
DAQ	Data Acquisition
DMC	Document Management Center
DOE	U. S. Department of Energy
DR	Deviation Requests
EDL	Equipment Deficiency List
ESH	Environment, Safety, and Health
ESH&Q	Environment, Safety, Health, and Quality
FHA	Fire Hazard Analysis
HBA	High Bay Area
HEPA	High Efficiency Particulate Air
I&C	Instrumentation and Control
ISMS	Integrated Safety Management System
JHE	Job Hazard Evaluation
JPM	Job Performance Measure
LCO	Limiting Condition of Operation
LDA	Loading Dock Area
LO/TO	Lock Out/Tag Out
MOU	Memorandum of Understanding
MSA	Management Self-Assessment
MSRE	Molten Salt Reactor Experiment
NCR	Non-conformance Reports
NCS	Nuclear Criticality Safety
NCSA	Nuclear Criticality Safety Approval
NSTD	Nuclear Science and Technology Division
OIO	Office of Independent Oversight
OJT	On-the-Job-Training
ORNL	Oak Ridge National Laboratory
ORO	DOE Oak Ridge Operations Office
ORR	Operational Readiness Review
P&E	Plant and Equipment
POA	Plan of Action
POD	Plan of the Day
POW	Plan of the Week

PPE	Personal Protective Equipment
PWD	Process Wastewater Drain
QAP	Quality Assurance Program
QAPP	Quality Assurance Program Plan
RBA	Radiation Buffer Area
RCT	Radiological Control Technician
RWP	Radiological Work Permit
SAR	Safety Analysis Report
SBMS	Safety Basis Management System
SER	Safety Evaluation Report
SME	Subject Matter Expert
SSC	Structures, Systems, and Components
STP	Startup Test Program
TIM	Training Implementation Matrix
TQPP	Training and Qualification Program Plan
TSR	Technical Safety Requirements
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
WP	Work Package
WSS	Work Smart Standards

EXECUTIVE SUMMARY

The Conversion Project (CP) is a new process designed to eliminate the risk associated with Sodium Fluoride (NaF) Traps containing uranium from the Molten Salt Reactor Experiment (MSRE). The pressure in these NaF traps, currently stored in Building 3019, continues to increase due to radiolytic decomposition.

The original scope of this project included conversion and removal of uranium fluoride contained in NaF traps to a stable oxide to be captured in separate conversion vessels. These conversion vessels would then be returned to Building 3019 for storage. The Department of Energy has recently reduced the scope of this project from conversion of the material in the traps to depressurizing the traps and returning them to storage. In addition to developing the process, the facility that the process will be conducted in, Building 4501, must be upgraded to a Category 2 nuclear facility.

When the scope of the project was reduced, the scheduled date for start of operations was moved up by approximately seven months. As a result, weaknesses in the administrative organization and documentation existed at the time this management self-assessment (MSA) was conducted. The most significant of these weaknesses were found in the area of Training and Qualification.

The team issued findings only for those items that it believed were significant. Findings were not issued for every item that was found, but these individual items are documented in the Form 1s in Appendix A. It is important that MSRE management review this report carefully to identify additional items requiring action prior to start.

The following findings were identified:

- OP-01 Conversion Project personnel did not follow the MSRE/CP/001-ADM procedure for verifying that the most recent document version was in hand. Contrary to the procedure, document status was verified using the Procedure Modification Log.
- OP-02 A requirement to perform a radiation survey after the last trap is depressurized had not been established.
- OP-03 JHE requirements had not been incorporated into work instructions.
- OP-04 Activities for which LO/TO was required had no documentation to indicate LO/TO was used. Work packages were marked NA for LO/TO.
- OP-05 Labeling requirements from the COO Manual had not been fully implemented.
- TQ-01 The Training Implementation Matrix (TIM) that defines and describes the application of DOE O 5480.20A has not been submitted to DOE. (Self-identified as an open item.)
- TQ-02 Standards for qualification and certification of operators and supervisors had not been established and approved by the Project Director. (Action completed during the MSA.) Qualification/certification cards had not been approved for use and implemented.
- TQ-03 Requirements for certification of fissile material handlers and supervisors of fissile material handlers had not been met. (Self-identified as an open item.)

- TQ-04 The qualification program for the hot cell operator, manipulator operators and operations supervisor has not been implemented.
- TQ-05 Training and Qualification files have not been established for Project personnel.
- MG-01 The Project's implementation of ISM, with respect to documenting Competence Commensurate with Responsibilities and providing Continuous Feedback and Improvement, required improvement to meet expected standards of practice for ISM.
- MG-03 A systematic review of the implementation status of the Terms and Conditions for the Project's AA, which includes by reference Work Smart Standards Sets 1 and 11, had not been performed.

1. INTRODUCTION

1.1 GENERAL

This report has been prepared to be consistent with the requirements of U.S. Department of Energy (DOE) Order 425.1B, *Startup and Start of Nuclear Facilities*. The scope of the management self assessment (MSA) is described in ORNL/TM-2002/163, *Operational Readiness Review Plan of Action for the Building 4501 Depressurization of Sodium Fluoride Traps Containing Uranium from the Molten Salt Reactor Experiment at Oak Ridge National Laboratory*. The original Conversion Project POA was prepared by line management and approved by the Associate Director for Nuclear Facilities Management, Office of Nuclear Energy, Science, and Technology on March 28, 2001. A revised POA for depressurization was submitted on October 22, 2002, and has not yet been approved.

The start authority is the DOE Office of Science Secretarial Office.

1.2 BUILDING 4501 SODIUM FLUORIDE TRAP CONVERSION PROJECT

Building 4501, a three-story steel, concrete block, and brick structure, is a radiochemical facility containing offices, chemical laboratories, hot cells, and a glovebox facility. The facility is primarily occupied by ORNL personnel of the Nuclear Science and Technology Division (NSTD). It supports a variety of ongoing research and development efforts, including the Building 4501 Conversion Project.

The basement floor contains laboratories, cell ventilation ducts, utility systems, and storage areas. The first floor houses four hot cells surrounded by support laboratories, offices, and operating areas. Located above the hot cell on the second floor is a high bay, (surrounded by offices and laboratories), which provides access to the top of the hot cells. This area is equipped with an overhead crane that is used for movement of shielded carriers that contain radioactive material. Packages are typically introduced into the hot cells by placing a shielded carrier over an access port in the top of the cell. The high bay area continues in the third floor of the building, where it is surrounded by equipment rooms.

The original scope of this project included conversion and removal of uranium fluoride contained in NaF traps to a stable oxide to be captured in separate conversion vessels. These conversion vessels would then be returned to Building 3019 for storage. The Department of Energy has recently reduced the scope of this project from conversion of the material in the traps to depressurizing the traps and returning them to storage.

Hot Cell D will be used in this depressurization process operation. This cell is located on the first floor level in a central island of Building 4501 that contains a total of four similar cells. The depressurization process equipment associated with the depressurization of 3019 NaF traps will be set up inside Cell D.

1.3 MANAGEMENT SELF-ASSESSMENT (MSA) PROCESS

The MSA was conducted to determine if the 4501 NaF Trap Conversion Project and support personnel had achieved an adequate state of readiness to commence depressurization operations.

An implementation plan was prepared for the MSA. The implementation plan was consistent with the requirements of DOE Order 425.1B. The scope of the MSA was described in the POA.

The implementation plan contained the overall assessment procedure, including the Criteria and Review Approach Documents (CRADs) that defined the review objectives and criteria, as well as the approach for assessing each objective.

Results of the MSA are provided in this report. Detailed results are on the Assessment Forms (Form 1) contained in Appendix A. All identified deficiencies are classified as pstart findings, which must be closed prior to commencing depressurization operations, or poststart findings, which may be addressed after commencing depressurization operations. These are identified on Deficiency Forms (Form 2) contained in Appendix B. Appendix C contains a list of the MSA team members and the functional area that each evaluated.

The MSA began on October 14, 2002, and concluded with an exit meeting on October 25, 2002.

2. MANAGEMENT SELF-ASSESSMENT RESULTS

2.1 OVERALL RESULTS

When the scope of the project was reduced, the scheduled date for start of operations was moved up by approximately seven months. As a result, weaknesses in the administrative organization and documentation existed at the time this management self-assessment (MSA) was conducted.

The Conversion Project team demonstrated a high degree of disciplined operations, equipment, and process knowledge and ability to respond to upset conditions. Test program documentation is excellent. Moral appears to be good, demonstrated by a responsive and enthusiastic team. The nature and extent of administrative deficiencies, however, suggest that readiness should not be declared until the findings contained in this report are corrected and the Training and Qualification functional area independently reviewed.

The team issued findings only for those items that it believed were significant. Findings were not issued for every item that was found, but these individual items are documented in the Form 1s in Appendix A. It is important that management review this report to carefully identify additional items that require action prior to start.

2.2 OPERATIONS (OP)

Activities associated with NaF Trap depressurization activities were assessed to determine if:

1. There were adequate and correct procedures for operation.
2. The level of knowledge of operations personnel was above average.
3. Conduct of Operations was implemented effectively.
4. An effective drill program had been implemented.

Approximately five evolutions were observed that required the use of procedures or operator aids. While observing these evolutions in the field, use of effective communications, proper labeling, procedure use, response to alarms, and control of system status were also observed.

Based on records reviewed, personnel interviewed, and evolutions observed, some programmatic elements of conduct of operations were not effectively implemented.

The operations team performed extremely well and demonstrated a full understanding of the need for discipline and formality in all operations and a desire to perform in that manner. It was obvious that personnel in the field had an excellent understanding of the process and procedures. They also demonstrated adequate knowledge of processes and requirements to fulfill their duties. However, staffing for this project, although adequate to perform all operations during single shift operations, does not allow for a long term absence of even one operator.

Although the team performed well, documentation to support completion of training and qualifications requirements was not available for review.

Nine out of 50 work packages prepared under the Conversion Project were reviewed and showed that the maintenance program was not adequately implemented. Although problems with the maintenance process were identified by CP management and staffing changes were made which showed improvement, weaknesses still exist. In general, work packages had inadequate work instructions and did not incorporate all safety controls identified in Job Hazard Evaluations (JHE). Additionally, lockout/tagout (LO/TO) requirements were not being consistently applied to performance of maintenance.

The engineering and fabrication process was reviewed and determined to be adequate to support certification during component fabrication, however the work package used for installation of the system into the hot cell was not adequate to support certification of the system as a whole. This problem was identified at the beginning of the start-up testing program and a robust inspection and testing program was established that adequately proved operability of the system.

Emergency drills and operations scenarios were conducted, and an adequate response capability existed. An emergency drill and two operations scenarios (drills) were observed. Based on the records reviewed, personnel interviewed, and the observed drills, an effective emergency and routine drill program had been established.

Five findings were identified in the operations functional area:

- OP-01 Conversion Project personnel did not follow the MSRE/CP-001-ADM procedure for verifying that the most recent document version was in hand. Contrary to the procedure, document status was verified using the Procedure Modification Log.
- OP-02 A requirement to perform a radiation survey after the last trap is depressurized had not been established.
- OP-03 JHE's are not adequately implemented through the work instructions in most work packages.
- OP-04 Activities for which LO/TO was required had no documentation to indicate LO/TO was used. Work packages were marked NA for LO/TO.
- OP-05 Based on the applicability matrix included in MSRE/CP/004-ADM, *Building 4501 Conversion Project Conduct of Operations Manual*, Chapter 18, Equipment and Piping Labeling is implemented through SBMS – System Engineering. Based on observations, the majority of labels affixed to components associated with the Conversion Project do not include the noun nomenclature as required under the System Engineering program.

2.3 TRAINING AND QUALIFICATION (TQ)

The assessment in the training and qualification functional area was performed against requirements established in the Plan of Action and described in the Management Self-Assessment Implementation

Plan.

Activities associated with NaF Trap Depressurization Operations were assessed to determine if:

1. The selection, training, and qualification programs for operations and support personnel have been established, documented, and implemented.
2. The level of knowledge of managers, operators, and operations support personnel is adequate.
3. Modifications to the facility have been reviewed for potential impacts on training and qualification, and training has been performed to incorporate all aspects of these changes.

Training program implementation and documentation was extremely weak. There are required elements that were not sufficiently in place to facilitate a complete and meaningful assessment of this core function. This area should be re-evaluated prior to declaration of readiness.

Some elements of a substantial operations training program are in place; however, significant work remains to demonstrate that a well-defined process is in place for qualification and certification of project personnel. Qualification has been prematurely determined to support current pre-operational activities without verification that elements of qualification had been completed.

Qualification/certification cards have not been approved for use and have not been implemented to clearly indicate progress in the program and, no approved standards for qualification and certification are in place. Certification examinations and oral board examinations have not been completed.

Qualification documentation that does exist focuses almost entirely upon personnel directly involved in operations. There appears to be no required qualification program for other project personnel.

The training implementation matrix (TIM), which defines and describes the application of the requirements of Order 5480.20A, has not been submitted to the Department of Energy for review and approval. Some revision to the training matrix document is needed prior to submittal. Because the TIM references the Training and Qualification Program Plan (TQPP), a revision of the TQPP to address identified discrepancies and deficiencies is also needed. A TQPP revision may be approved prior to TIM submittal, or the TIM may indicate a "compliance date" within the project schedule when a revision would be approved.

The TQPP adequately flows down requirements for management of training and qualification records, and there was evidence that individual and program files would support documentation needs as the records are generated. At this point, management of records of classroom training must be improved to ensure adequate documentation of training content, approval for delivery, and retrievable storage requirements are met.

The findings identified in the training and qualification functional area are as follows:

- TQ-01 The Training Implementation Matrix (TIM that defines and describes the application of DOE O 5480.20A has not been submitted to DOE. (Self-identified as an open item.)
- TQ-02 Standards for qualification and certification of operators and supervisors had not been established and approved by the Project Director. (Action completed during the MSA.) Qualification/certification cards had not been approved for use and implemented.
- TQ-03 Requirements for certification of fissile material handlers and supervisors of fissile material

handlers had not been met. (Self-identified as an open item.)

TQ-04 The qualification program for the hot cell operator, manipulator operators, and operations supervisor has not been implemented.

TQ-05 Training and Qualification files have not been established for Project personnel.

2.4 SAFETY DOCUMENTATION (SD)

Activities associated with NaF Trap depressurization operations were assessed to determine if:

1. The safety documentation addressed appropriate hazards and risks.
2. A SAR and TSR have been approved by DOE and implemented.
3. JHEs have been completed.
4. NCSAs have been completed and implemented.

The safety basis and authorization agreement are issued. The safety basis is implemented and the USQ process is being effectively used to maintain it current. The safety basis still addresses the entire scope of the original Conversion Project mission instead of being tailored or restricted to just depressurization activities. The scope is somewhat restricted by the operational mode of STANDBY in which the depressurization will be performed. Job hazard evaluations were adequately prepared for project procedures. Conversion Project personnel are working to complete a few open items before startup e.g., revising the Fire Hazards Analysis to address additional safety SSCs, updating the non-Conversion Project building radioactive inventory, and finishing the revision of the Local Emergency Manual. Conversion Project safety analysts use uncontrolled copies of USQDs and USQ screens for reference in preparing new USQDs and screens and revising existing ones. A controlled distribution of those documents should be made to the limited set of users who need them as part of the safety basis. The NCSAs applicable to the project and their supporting evaluations were reviewed and found to well written and comprehensive. The requirements from the NCSAs were implemented via operating procedures. Observations of various evolutions demonstrated a good understanding of the NCSA requirements by the operations personnel.

There were no findings in the safety documentation area.

2.5 STARTUP TEST PROGRAM (STP)

The assessment in the startup and testing functional area was performed against requirements established in the Plan of Action and was described in the Management Self-Assessment Implementation Plan. Configuration management was also included in this functional area due to its applicability to the structures, systems and components necessary for startup and operations. Activities and documentation associated with NaF Trap Depressurization Operations were assessed to determine the following:

1. Inspection and testing of structures, systems, and components (SSC) were conducted using established acceptance criteria.
2. Equipment used for inspection and testing was calibrated and maintained.

3. Testing was adequate to demonstrate operability of all SSCs.
4. Administrative controls were in place to control the configuration of systems important to safety.
5. A start plan had been developed to address initial operation following start.
6. A configuration management system was used to maintain control over design and modifications of SSCs and over safety documentation.

The Conversion Project Testing Program was thorough and well written. The program was applicable to both pre-operational testing and testing for maintenance activities. Pre-operational/startup tests have all been completed and documented on both components and integrated systems. Surveillance testing has been satisfactorily completed for the STANDBY mode of operation. Observations of evolutions confirmed that the equipment operated as expected.

The *Start-Up Plan for the Depressurization of UF₆ Loaded NaF Traps Removed from the Molten Salt Reactor Experiment Facility* was documented and approved. First use controls are well described in the Plan but there is confusion with respect to approval authority for release of these controls. The Plan does not allow flexibility in the description of what is an “evolution” and only allows the removal of first use controls per each evolution.

Conversion Project personnel associated with the configuration management of safety SSCs and procedures were knowledgeable and effectively executing the program. The Conversion Project was especially effective in implementing the USQ process. Several of the procedures (MSRE/CP/001, 003, and 017-ADM) need improvement for consistency in the role of the Conversion Project Configuration Manager and accuracy in references.

There were no findings in the startup and testing functional area.

2.6 MANAGEMENT (MG)

Activities associated with NaF Trap Depressurization Operations were assessed to determine if:

1. Functions, assignments, responsibilities, and reporting relationships were clearly defined, understood and implemented.
2. The authorization agreement was in place.
3. Work Smart Standards had been implemented to support startup.
4. An Integrated Safety Management System had been implemented.
5. An effective issues management program had been established.

The MSA Team observed that all levels of project and facility line management, as well as support personnel, recognized and accepted their responsibility for safety. Operational roles were clearly defined and practiced.

An authorization agreement (AA) was in place and properly executed. The AA contained the expected terms and conditions.

An adequately functioning issues management program (the ATS system) was in use. However, improvement was needed in the area of tracking internal assessments.

The following two findings were identified in the management functional area:

- MG-01 Project-specific ISMS implementation tools have not been identified. The Project's implementation of ISMS with respect to documenting Competence Commensurate with Responsibilities as well as providing Feedback and Continuous Improvement requires improvement to meet expected standards of practice for ISM.
- MG-03 systematic review of the implementation status of the Terms and Conditions for the Project's AA, which includes by reference Work Smart Standards Sets 1 and 11, has not been performed. Specific elements of the WSS for the Project had no implementing tool(s).

Appendix A
ASSESSMENT FORMS (Form 1)

MSA ASSESSMENT FORM

Functional Area: Management (MG)	Core Requirement Number: CR-1	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility, and observed evolutions as indicated below.

Personnel Contacted/Position:

- Project Director, MSRE Uranium-233 Conversion Project
- Project Deputy Director, MSRE Uranium-233 Conversion Project
- Facility Manager, MSRE Uranium-233 Conversion Project and Building 4501
- Operations and Technical Manager, MSRE Uranium-233 Conversion Project
- Readiness Manager, MSRE Uranium-233 Conversion Project
- Quality Assurance Coordinator, MSRE Uranium-233 Conversion Project
- Health and Safety Representative, MSRE Uranium-233 Conversion Project
- Radiological Control Technician, Buildings 4501 and 4505
- Records Management Coordinator, NSTD

Records & Other Documents Reviewed:

- *Focused Safety Management Evaluation of the Oak Ridge National Laboratory*, DOE Office of Environment, Safety and Health Oversight, August 2001
- *Focused Evaluation of Work Planning and Control in Research & Development Organizations*, IO-2002-09, Office of Independent Oversight, issued August 29, 2002
- *Integrated Safety Management System (ISMS) Program Description*, Oak Ridge National Laboratory, issued April 17, 2001
- *Integrated Management Program (IMP) Description*, Oak Ridge National Laboratory (draft)
- *Integrated Safety Management Plan*, Chemical Technology Division, Oak Ridge National Laboratory, March 2001
- *Evaluation of ORNL ISMS/SBMS Program, Final Report, Factual Accuracy Version*, Office of Independent Oversight, September 2002
- *Conversion Project Facility Work Authorization*, MSRE/CP/003-ADM, Revision 2, issued June 20, 2002
- *MSRE 4501 U233 Conversion Project Review of Issues Identified in Recent Operational Readiness Reviews and DOE Assessments for Lessons Learned*, undated, provided to MSA Team on October 21, 2002
- Memorandum from G. Chitwood to distribution, *MSRE U-233 Conversion Project Assessment Schedule for CY 2002*, June 17, 2002

Evolutions/Operations Witnessed:

- Facility walk-down, October 10, 2002
- POD, October 15, 2002
- Pre-Job Briefing, October 15, 2002
- Performance (partial) of MSRE/CP/014-ADM, October 15, 2002
- POD, October 17, 2002
- Pre-job drill brief, October 17, 2002
- Pre-job drill brief, October 18, 2002

MSA ASSESSMENT FORM

Functional Area: Management (MG)	Core Requirement Number: CR-1	Date: October 23, 2002
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- Drill evolution (simulated Monitron alarm), October 18, 2002
- Post-drill brief, October 18, 2002
- Response to CAM alarm, October 18, 2002

Discussion:

Safety Culture Assessment. All levels of project and facility line management were found to recognize and accept their responsibility for safety. Staff-level personnel were keenly aware of operational safety precautions and limitations.

Operational roles and responsibilities were clearly defined and practiced. Interfaces between organizations were deemed healthy and effective. Facility and project management, with support from ES&H, functioned effectively to plan and execute work activities.

Personnel were found to meet or exceed expectations for competency commensurate with responsibilities. The level of knowledge observed during the MSA was excellent. However, training qualification and certification program requirements were not satisfied.

No evidence of “schedule over safety” was found. Safety items generally receive priority. However, improvement is needed in prioritizing safety-related maintenance and inspection tasks. Repair or replacement of the PA system on the first floor and completion of the fire door inspection and testing requirements were examples of concern to the MSA Team.

Applicable standards and requirements were generally recognized and addressed by the Project. Specific weaknesses in implementation are described in this report under the applicable functional area(s). Overall, the Project would have benefited from the use of flow-down matrices or cross-walks to track the implementation and compliance status of key requirements such as the TSRs, FHA, NCSAs, RWPs, and JHEs.

Project personnel were found to value and properly emphasize the use of tailored hazard control techniques. Performance in this area was rated excellent in terms of practice, lacking in terms of infrastructure and documentation (e.g., neither the NCS approvals nor the Training Program qualifications were complete at the time of the MSA).

Lastly, the MSA did not reveal any areas where the appropriate operations authorizations were not being pursued. However, as documented in this report, in specific cases, the authorizations were not in place at the time of the MSA.

Implementation of Safety Management Systems. The Project does not have a stand-alone ISMS Plan. The Division-level ISM Plan is out-of-date with respect to issues such as the formation of NSTD, NNFD, and other significant programmatic changes. A Division-Level Plan for NNFD has not been developed. A Directorate-level ISM Plan has not been developed. The in-force Laboratory-Level ISM Program Description document describes existing and future expectations for Laboratory-wide ISM management systems, and as such was initially viewed by the MSA team as a works-in-progress. It was then determined that a revision to the Laboratory ISM Plan was in development at the time of the MSA. The draft Program Description was reviewed and found to be much less tentative, but also much less descriptive, in terms of establishing Laboratory expectations for integrated safety management systems. However, an issue date for the revised Plan had not been

MSA ASSESSMENT FORM

Functional Area: Management (MG)	Core Requirement Number: CR-1	Date: October 23, 2002
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established at the time of the MSA. Therefore, the existing ISM Program Description and in-force NSTD ISM Plans served as the requirements documents for the MSA. It was noted as a concern that the Project has not established in writing its commitment to ISM, or conversely, any explicit link(s) to ISM requirements documents.

The Laboratory's ISM Program Description requires each Division to have at least one organization-specific ISMS Plan. The NSTD predecessor document satisfies this requirement. However, the CTD ISM Plan does not account explicitly for Building 4501 facility or CP activities. Nevertheless, the Plan does establish Division-level expectations for ISM program elements that the CP Project must implement. Consistent with the structure of the Plan, those elements were reviewed on a core function-specific basis with results as noted below.

- **Defining the work scope.** The CP project has an appropriately scoped and approved Authorization Agreement. The current work scope is understood by the Project Team to be limited to the depressurization portion of the Conversion Project. However, DOE has not formally directed this de-scoping change, and the POA for DP-related Readiness Activities has not been approved.
- **Analyzing the hazards.** Building 4501 had an approved SAR and TSR set. An ALARA Review had been performed. Project-specific RWPs were in place. Project nuclear criticality safety approvals were pending. An update to the Local Emergency Plan for Building 4501 was pending. JHEs had been performed for the operating procedures to be used by the Project. JHEs had been performed for maintenance activities required in support of the Project. MSDSs used by the Project were available on-line.
- **Identifying and implementing controls.** For the facility, project-specific safety-significant structures, systems, and components have been identified. LCOs have been established for active SS SSCs and appropriate TSR surveillances are in place. Proper PPE usage and radiological control practices have been established and were observed to be in use. Facility-specific training was given to all MSA Team members prior to allowing unescorted access to Building 4501. However, for maintenance evolutions, the MSA Team found that inadequate work planning and control practices were established and enforced.
- **Performing work within controls.** Project personnel were observed to be very attentive to safety-related work controls. All proposed subcontracts are evaluated for ISM flow down and safety performance by the NSTD ES&H Service Subcontract Reviewer. Appropriate briefings and safety mentoring sessions were held. Stop-work authority was established by procedure and reinforced frequently during briefings. Personnel were found to have a high level of knowledge with respect to safety duties and responsibilities under nominal and simulated emergency conditions. However, required qualification and certification training programs had not been completed at the time of the MSA.
- **Providing continuous feedback and improvement.** Management walk-about, as required by the Plan, are performed but not documented. Formal Project Group safety meetings are held infrequently. However, interactive feedback sessions are held as needed during pre- and post-job briefings. Items requiring follow-up are tracked on an Equipment Deficiency List. EDL status was found to be monitored by line management up to and including the Project Director. Project-specific performance measures have not been developed. Lessons learned dissemination

MSA ASSESSMENT FORM

Functional Area: Management (MG)	Core Requirement Number: CR-1	Date: October 23, 2002
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is infrequent. However, the Deputy Project Director and Facility Manager monitor LLs from internal and external sources.

Additionally, the Project has compiled a list of lessons learned from recent ORRs. Though implementation of all items was not complete at the time of the MSA, the proactive approach was noted as a good business practice.

Internal and external assessments are scheduled as required by the Project's QAPP. Results are monitored to completion, and the Project's commitment to implement improvements was evident. However, it was noted that assessments scheduled for July 2002 were not yet complete.

It was further observed that a comprehensive listing of all required functional area-specific assessments had not been developed. Such a list would have been useful to the Project and the MSA Team. It was also observed the record copies of some of the assessments had not reached the NSTD DMC.

Focused Safety Management Evaluation. The referenced evaluation was performed by the DOE Office of Environment, Safety and Health Oversight (EH-2). Implementation of applicable recommendations and observations from this evaluation was identified in the Project POA as an ORR prerequisite. The MSA Team reviewed the evaluation, noted the safety concerns reported by EH-2, and looked for evidence or other indications that the Project has taken action to specifically address these or other results of the evaluation. The MSA Team found that the Project had performed a review of the EH-2 evaluation and developed an issue-by-issue response.

The five Contractor-related concerns noted by the EH-2 assessment team, and the Project's status at the time of the MSA, were:

- **ES&H roles and responsibilities for line management are not adequately defined and understood.** Project-specific documents, and interviews and observations conducted during this MSA, indicate that the Project's performance in this area is excellent. Line management responsibility for safety is well-established and practiced.
- **Work planning and control processes are not well-defined or documented.** The Project's Facility Work Authorization document was viewed by the MSA Team as an excellent tool for planning and conducting operational evolutions. However, significantly improved performance is needed in terms of work planning and control for maintenance activities.
- **Numerous Division-level procedures are not adequately developed and/or used to support effective ISM implementation.** The ISM Plan for the Chemical Technology Division (predecessor to NSTD) was reviewed during the course of the MSA. Given that the Plan does not reflect the formation of NSTD, NNFD, and other significant programmatic changes, it is not an effective ISM implementing vehicle. However, a Laboratory initiative is underway to retire all Division-level ISM Plans once a Laboratory-level Integrated Management Program Description document is issued.

The Project has defined the JHE process as adequate for addressing this issue. However, there are many aspects of ISM beyond those covered by JHEs. Therefore, the MSA Team found that the Project was lacking in the development and use of explicit and comprehensive ISM implementation tools.

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- **Configuration management is not being implemented as required.** The Project has developed a series of CM-related procedures. The program was found to be adequately implemented.
- **Feedback and improvement processes are not adequately defined or implemented to effect consistent, continuous improvement.** Based on interviews, Project management and staff were found to be fully committed to the principles of feedback and continuous improvement. Real-time feedback sessions were held during pre- and post-job briefings. Noteworthy items were tracked to closure using the EDL. However, the frequency and documentation of safety meetings, management walk-about, and lessons learned dissemination was inconsistent. Additionally, project-specific performance measures – not related to cost or schedule – had not been developed.

Focused Evaluation of Work Planning and Control in R&D Organizations. The referenced evaluation was performed by the UT-B Office of Independent Oversight (OIO). Implementation of applicable recommendations and observations from the evaluation was identified in the Project POA as an ORR prerequisite. In the evaluation, an R&D work authorization and control process in use by R&D groups within the Laboratory (Research Safety Summaries or RSSs) was examined. The MSA Team confirmed that an RSS was completed for the Project. Additionally, the MSA Team reviewed the OIO evaluation, subjectively identified issues appropriate for action by the Project, and looked for evidence or other indications that the Project has taken action to address specifically these or other results of the evaluation. The MSA Team found that the Project had developed an issue-by-issue response to the OIO evaluation.

From the perspective of the MSA Team, the following key items from the evaluation warranted examination and action by the Project.

- **A well-defined work authorization and control process should be established and implemented.** The Project's Facility Work Authorization document is an excellent tool for meeting this objective. As noted above, however, improved performance is needed in terms of work planning and control for maintenance activities.
- **A well-defined process should be established and implemented to determine and document that Project and support personnel are appropriately knowledgeable, experienced, and trained.** While Project personnel have exhibited high levels of knowledge and are known to have extensive experience, the Project's training program is insufficiently mature to state that this objective has been met.
- **Mechanisms to ensure that line management verifies safety performance during skill-of-the-craft evolutions should be in place.** The Project utilizes on-the-job training, job performance measures, and other forms of supervisory oversight and mentoring to evaluate operational and safety-related techniques during the performance of Project-specific procedures. Given that the training program was not fully implemented, the MSA Team could not conclude that this objective had been met.

Conclusion:

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Project personnel were observed to be keenly aware of their safety-related duties and responsibilities. Line management responsibility for safety was evident in the practices and procedures associated with the Project. However, until programmatic deficiencies in ISM are addressed, the Project cannot satisfy CR 1 and Prerequisites 1-1 and 1-2.

Inspected by: _____ / signature on file/ L. R. Bauer	Approved by: _____ / signature on file/ G. A. Harvey
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility, and observed evolutions as indicated below.

Personnel Contacted/Position:

- Conversion Project Director
- Conversion Project Deputy Director
- Conversion Project and Building 4501 Facility Manager
- Conversion Project Operations and Technical Manager
- Radiological Control Technician, Buildings 4501 and 4505
- Conversion Project Health & Safety Representative
- Conversion Project Quality Assurance Coordinator

Records & Other Documents Reviewed:

- *MSRE Uranium-233 Conversion Project Organization Chart*, issued September 10, 2002
- *MSRE ²³³U Conversion Project Building 4501 Quality Assurance Program Plan*, MSRE/CP/021-ADM, Revision 2, issued December 2001
- *MSRE ²³³U Conversion Project Building 4501 Quality Assurance Program Plan*, MSRE/CP/021-ADM, Revision 3, issued September 2002
- *Quality Assurance Program Description*, issued January 31, 2002
- *Conversion Project Facility Work Authorization*, MSRE/CP/003-ADM, Revision 2, issued June 20, 2002
- *Facility-Use Agreement: Radiochemistry Laboratory, Building 4501 Non-reactor Nuclear Facility Complex*, FUA-NUC-4501-R0, issued October 2002
- *DOE Approval of Change of Management for UT-Battelle, LLC, Managed Facilities Other Than DOE Office of Nuclear Energy, Science and Technology (NE) Facilities*, Memorandum from H. Vogel to ORNL Distribution List with three attachments, September 4, 2002
- *Transferring Responsibilities to NNFD Beginning October 1, 2002*, Approval Memorandum, UT-Battelle Signatories, September 27, 2002
- *Facility Index*, accessed via the ORNL Facilities and Operations web site, October 17, 2002
- *Facility Responsibility Directory*, accessed via the ORNL Facilities and Operations web site, October 17, 2002

Evolutions/Operations Witnessed:

- Facility walk-down, October 10, 2002
- POD, October 15, 2002
- Pre-job Briefing, October 15, 2002
- Performance (partial) of MSRE/CP/014-ADM, October 15, 2002
- POD, October 17, 2002
- Pre-job drill brief, October 17, 2002
- Pre-job drill brief, October 18, 2002
- Drill evolution (simulated Monitron alarm), October 18, 2002
- Post-drill brief, October 18, 2002

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- Response to CAM alarm, October 18, 2002

Discussion:

Clarity of Project Roles and Responsibilities. Based on direct observations, interviews, and document reviews, Project-specific assignments, roles and responsibilities have been clearly defined and implemented. The reporting chain utilized is consistent with the Project's organization chart. Work authorization responsibilities have been adequately defined in the Project's Work Authorization Document. Plan-of-the-Day and Pre-Job Briefings are conducted reasonably effectively by Operations Supervisors. When evolutions are in progress, the names of the individuals serving as Operations Supervisor, Manipulator Operator, Status Board Operator, Panel Operator, DAO Operator, and FTIR Operator are prominently displayed in the Control Room. Changes to these assignments are noted promptly, both verbally and on the wall-mounted Status Board.

Interface with Facility Management. On numerous occasions during the assessment, facility condition or work authorization questions arose. Without exception, those questions were appropriately routed to the Facility Manager or his representative. The Facility Manager was in attendance at the POD meetings, responded promptly to questions regarding facility status, and is a required signature on the Project's work authorization form. Similarly, Project representatives attend the Facility POW meetings.

Overall, the effectiveness of the interface between facility and project management was deemed excellent. No examples of disconnects at the facility-project interface were found.

Interface with ES&H. Based on interviews with Project and ES&H personnel, the interface with ES&H was functioning effectively. ES&H personnel were actively engaged in the Project's planning cycle and day-to-day operation. ES&H personnel felt confident that all Project managers and staff members place adequate value and emphasis on safety practices.

Impact of NNFD on Roles and Responsibilities Relating to the Project. As indicated above, the Project-facility interface is functioning effectively, though it is early in the formation of NNFD. A Facility-Use Agreement has been developed and executed, and adequately describes the roles and responsibilities needed for the nuclear facility component of the Project. However, the formation of NNFD, and recent changes in its management structure, has rendered web-based information on facility ownership and management out-of-date.

Project Organization Chart and Quality Assurance Program Plan. The stand-alone Project organization chart, provided to the MSA Team on October 10, 2002, was up-to-date and adequately represented the WBS needs of the Project. Personnel had been assigned to all positions; no TBD personnel assignments were encountered during this assessment.

The Project organization chart was not consistent with the version of the MSRE Conversion Project Quality Assurance Program Plan (QAPP) listed on the Project's web site. However, it was quickly identified to the assessor that a Revision 3 of the QAPP was in development. A review of Revision 3 showed that the Project organization chart was generally consistent with the Project's QAPP. (It should be noted that Revision 3 was issued and the web site was properly updated during this assessment.)

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The review of the Project QAPP (Revision 3) revealed some minor disconnects in the roles and responsibilities for the Project. Specific examples include the use of titles in the QAPP narrative that do not appear on the QAPP or Project organization charts (Project Controls Manager, Materials Manager, Training Manager, and Records Manager). It was also noted that the QAPP and other documents use the term "Task Leader", but this position does not appear in the functional responsibilities section of the QAPP.

More significantly from a roles and responsibilities perspective, the QAPP identifies the Operations Manager as responsible for the implementation of the Project's AA. However, the staff-level personnel listed as responsible for AA implementation report to the Facility Manager, not the Operations Manager. Ownership of AA implementation could be more clearly presented in the QAPP.

The QAPP also appeared to contain overlap in terms of assigned responsibilities for the SAR/TSR Implementation personnel and the Safety Analysis personnel. The same concern was noted for the Maintenance Coordinator and Configuration Management personnel. In the latter case, both functions were assigned responsibility for configuration control; one reports to the Facility Manager and one to the Operations Manager. It would seem appropriate to clarify responsibilities for Project compliance with configuration control-related procedures.

Lastly, the QAPP should be updated to replace the references to the Project's S/RIDs with WSS Set 11 (p. 2-4 of QAPP Attachment 2), and to ensure all entries on the Project Evaluation (Attachment 3 to the QAPP) are completed or designated N/A. At the time of that update, corrections should be made to the paragraph on responsibilities for the Process Equipment Manager; one or more words are missing from the section.

Conversion Project Facility Work Authorization Document. The development and use of a Conversion Project Facility Work Authorization document is considered a good practice. The document is appropriately scoped and well-written, and provides clear roles and responsibilities for the Project. While it was noted that the document does not contain any responsibilities for the Deputy Project Manager, Readiness Manager, and Technical Manager, these positions do not have work authorization-related duties unless they are serving in an acting capacity for positions with established responsibilities.

It was also noted that the Conversion Project Facility Work Authorization document does not include the Facility Manager as a required reviewer. Further, the Facility Manager's signature is not required on a "Request for Work, Modification and/or Engineering Change or Addition." However, the Facility Manager's signature is required on the "Conversion Project Facility Work Authorization Form." (No requirement dictates more front-end participation by the Facility Manager; however, it is a recommended good practice to improve coordination and minimize rework.)

Implementation of the Project QAPP. The Project QAPP addresses the criteria established by 10 CFR 830, Subpart A, as present in the ORNL QAP Program Description. As described below, one area potentially under-represented in the Project QAPP was in the area of calibrations.

Implementing tools for the Project's QA Program, as evidenced by Attachment 2 to the Project QAPP, are generally in place. The only required element for which a Project- or Division-specific

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implementing tool was not found was with respect to a Calibration Plan. While it is not necessary to have a Project-specific Calibration Plan, a reference to a Division- or Laboratory-Level Calibration Plan or Program Description is appropriate to address 10 CFR 830 Criteria 5 and 8.

The effectiveness of the implementing tools listed in the QAPP was evaluated on a functional area-specific basis and is therefore reported elsewhere in this report. However, one area of concern appropriately discussed in this section was with respect to controlled documents. The Project QAPP calls for numerous documents and records to be controlled, i.e., controlled distribution. However, given the use of the Project's web site for document retrieval, compliance with this requirement was questioned. Controlled documents are available via the Project's web site and do not contain an intended document distribution list. It was further noted that controlled documents posted on the Project's web site are not always complete in terms of approval status. The Project's in-force ALARA Plan, for example, contains a blank signature page.

Conclusion:

The Project's Quality Assurance Program Plan has been adequately implemented. The organization chart for the Project is up to date. Personnel have been assigned to all positions. Personnel responsibilities are documented and understood. Therefore, CR-2 and its associated prerequisites were satisfied at the time of the MSA.

Inspected by: <u> /signature on file/ </u> L. R. Bauer	Approved by: <u> /signature on file/ </u> G. A. Harvey
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Training Coordinator for 4501 NaF Trap Depressurization
- Instructor for facility access and orientation training
- ORNL Nuclear Material Control & Accountability Coordinator
- Training Coordinator for controls and instrument technicians in Facilities and Operations Directorate
- Conversion Project Operations Manager
- Conversion Project Facility Manager
- Project Document Specialist
- Procedure Writer
- Project Director

Records and Other Documents Reviewed:

- *Training and Qualification Program Plan for the Building 4501 Conversion Project*, Revision 1, February 4, 2002
- Training Implementation Matrix table prepared to indicate status of compliance with requirements of DOE Order 5480.20A (proposed addition to the ORNL Training Implementation Matrix for DOE ORDER 5480.20A, *Personnel Selection, Qualification, And Training Requirements For DOE Nuclear Facilities*)
- Letter, J. E. Ruston to R. E. Rosenbaum, et.al., Startup Qualification for 4501 Depressurization Project (regarding qualification of J. R. Travis, Badge #33170) October 14, 2002.
- Letter, J. E. Ruston to R. E. Rosenbaum, et.al., Startup Qualification for 4501 Depressurization Project (regarding qualification of D. W. Simmons, Badge #19803), October 14, 2002.
- Letter, J. E. Ruston to R. E. Rosenbaum, et.al., Startup Qualification for 4501 Depressurization Project (regarding qualification of J. P. Cook, Badge #627275), October 14, 2002.
- Certification Card, Fissile Material Handler/Hot Cell Operator
- Certification Card, Fissile Material Handler/Manipulator Operator
- Certification Card Fissile Material Supervisor/Project Operations Supervisor
- MSRE Uranium-233 Conversion Project Organization Chart, September 10, 2002
- 4501 Conversion Project Training Matrix
- On-the-Job Training and Job Performance Measure (OJT/JPM) for MSRE/CP/014-OPS
- OJT/JPM for MSRE/CP/108-OPS
- Training Memorandum of Understanding (MOU) for Support Activities Between the Chemical Technology Division and the Instrumentation and Control Division, May 29, 2001
- Training Memorandum of Understanding (MOU) for Support Activities Between the Chemical Technology Division and the Facilities and Operations Directorate, May 30, 2001
- Training Memorandum of Understanding (MOU) for Support Activities Between the Chemical Technology Division and the Operational Safety Services Division, May 29, 2001
- Chapters V and XIV, MSRE/CP/004-ADM, *Building 4501 Project Conduct of Operations Manual*, Revision 1, dated September 30, 2002
- Selected reports from the electronic required reading delivery system

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Evolutions/Operations Witnessed:

None

Discussion:

1. No changes were made to the Training and Qualification Program Plan for the Building 4501 Conversion Project (TQPP), Revision 1, February 4, 2002, for the reduced scope NaF depressurization project. The Training Coordinator stated that the primary difference between qualification/certification for the full scope Conversion Project and NaF depressurization project is that training on the more limited scope procedure, MSRE/CP/108-OPS, *Depressurization of 3019 NAF Traps*, was completed, rather than training on MSRE/CP/008-OPS as planned for the full scope Conversion Project. The specific scope of training, qualification and certification should be clearly stated to ensure any changes in scope are properly addressed.

According to the Training Coordinator, The TQPP was originally written as a procedure. The TQPP was then revised to define programmatic requirements as a “plan” rather than using the prescriptive steps of a procedure format. The revision log states that the “format of the TQPP was changed to that of a plan rather than a procedure.” Regardless of formatting, the document does provide a mechanism to establish program requirements. The document header for the Pages for the TQPP is incorrectly dated February 2001, rather than 2002.

2. The DOE O 5480.20A Training Implementation Matrix table prepared for the project has not been submitted to the Department of Energy—Oak Ridge Operations (DOE-ORO) for review and approval. The DOE-ORO manager interface has requested that this table be accompanied by a revision to the narrative portion of the ORNL Training Implementation Matrix for DOE Order 5480.20A (currently maintained as an electronic document) to include identification of the 4501 facility and listing of the positions associated with the project that require qualification/certification. DOE review and approval may be accomplished by submittal of paper copy of the proposed table and revisions.
3. The TQPP does not clearly identify the positions associated with the project that require qualification and/or certification. The table in Section 3.3.11 does provide opportunity to relate specific project positions to those positions described by DOE O 5480.20A, but actual position titles are not identified in some cases. Particularly in the area of “Technical Staff,” it is not clear which positions identified in the organization chart require qualification.

Effort in personnel qualification and certification has been focused on the operators and supervisors. Although the Training Coordinator acknowledged that other project positions require qualification under the scope of DOE O 5480.20A, he added that these positions have not been clearly identified. Too, requirements for qualification have not been analyzed/defined for these positions.

4. Section 3.2.2 of the TQPP states that “members of the CP (Conversion Project) requiring qualification are Technical Team members who support Process Chemistry (out of scope for this assessment) and provide technical support for the process, as designated by the Technical Manager and Project Director. The order requires “a list of specific technical support personnel

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position is developed that have a direct impact on employee, facility, or public safety” [Chapter I.h.(1)]. Although qualification in this area may be determined by virtue of meeting entry-level requirements and by completing applicable position-specific training (an examination need not be administered), the basis must be established for qualification.

5. Chapter IV.2.a.(3)(b) of DOE Order 54800.20A requires that “Managers shall receive facility-specific training based upon a comparison of the individual’s background and abilities with the responsibilities and duties of the position. No requirements for manager training have been defined.
6. The TQPP does not identify the specific training topics in Chapter I.7.h. of DOE O 5480.20A defined for supervisors. The qualification card for the Operations supervisor lists “Manager’s and Supervisor’s Training” without further definition of what this training involves.

Entry level experience requirements established for supervisors by DOE O 5480.20A are not defined as flow-down requirements in the TQPP.

7. The TQPP and the Training Implementation Matrix table refer to MSRE/CP/005/-ADM, *Nuclear Facility Training and Qualification for Building 4501 Nuclear Hot Cell D*. This procedure was cancelled on September 3, 2002. According to the Training Coordinator, the requirements of this procedure were incorporated into the TQPP with the last revision. No explanation for the lag time between Revision 1 of the TQPP and cancellation of this procedure was provided.
8. In regard to certification requirements, Section 3.3.2. of the TQPP references “designated Operation Technicians and Operations Supervisors in the CP organization chart.” “Operations Technicians” are not identified in the organization chart. Instead, CP Hot Cell Operations “Technical” and “Manipulator Ops” are named. Section 3.3.5 has a similar reference to “Operations Technicians and Operation Technicians Supervisors.” Consistency in position titles is needed.
9. Section 3.2.5 of the TQPP states that “Specific requirements for qualification are identified in the training QS (Qualification Standards). Employee shall complete all requirements identified in the QS. Similarly, section 3.3.3 states that “Specific requirements for certification are identified in the CS (Certification Standards). Candidates complete all requirements identified with the standard. According to the Training Coordinator, qualification standards and certification standards have not been developed for the positions requiring qualification/certification.
10. The TQPP refers multiple times to cancelled procedure, ORNL-TR-002, Exceptions to ORNL Nuclear Facility Training Program Requirements. This procedure was replaced by the Standards-Based Management System (SBMS) procedure, “Granting Exceptions to Nuclear Facility Training Program Requirements,” on September 9, 2001.
11. In Section 3.1.3, the TQPP reference to “Operating Organization” followed by the parenthetical example “(i.e., DOE-ORO)” is inappropriate. The Operating Organization as defined by DOE O 5480.20A is the “onsite contractor organization responsible for operation.” This section also does not clarify that the cases for DOE-OR approval of exception to entry level requirements

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are ones that do not consider alternatives or substitutions but rely upon the collective experience of the operating organization. (This case is addressed by the SBMS procedure, "Granting Exceptions to Nuclear Facility Training Program Requirements.")

12. Section 3.3.5 of the TQPP has confused verification of satisfactory completion of qualification that results in certification (DOE O 5480.20A, Chapter I.6.b) with the makeup of the oral board. This section also conflicts with statements made in Section 6.4.3, entitled "Oral Boards."
13. The Training Coordinator produced a qualification card format with a common generic position title that was being tailored to each person involved in hands-on operations and supervision. With a suggestion from the assessment team member that the qualification cards should be related to each position requiring qualification, three separate qualification cards for the operations level positions were developed the same day for hot cell operator, the manipulator operators, and the operations supervisors.

The Training Coordinator also produced letters dated October 14, 2002 from the Project Director to the Training Manager establishing "subject matter expertise" of the operators and supervisors. The letters regarding the operators stated that each was "qualified to operate the depressurization process equipment, provide direction to trainees, and perform classroom and on-the-job training after completion of appropriate Instructor Training. The letters prepared for supervisors stated that they additionally were qualified to supervise all phases of the depressurization process" and "process personnel." The letter noted that each person was "eligible to site for the certification exam.

The Training Coordinator stated that all requirements for qualification of operators and supervisors have been satisfied (with the exception of training on the unapproved NCSAs) and each person is awaiting written and oral board examinations for certification as fissile material handlers and supervisors. Qualification cards need to be used to verify that all elements of qualification have been satisfied by each person. This assessment has indicated that there are some elements in addition to NCSA training that are incomplete.

14. The Training Coordinator reports to the Nuclear Science and Technology Division Training Manager. The Training Coordinator had been determined qualified by the Training Manager as a "classroom trainer and OJT/JPM trainer/evaluator" on October 11, 2002. The Training Coordinator stated that he alone had been conducting on-the-job training and administering job performance measures for operations personnel. He noted that he has participated in verification/validation of procedures with the project team.
15. The content requirements of DOE O 5480.20A (I.7.e) for "General Employee Training" are met by combining ORNL General Employee Training Program and the access orientation/training for the hot cell and high bay areas of the facility. The Order, however, requires evaluation of understanding by "administering a written examination." The facility access orientation/training did not require a test for successful completion. An unlimited validity period for the qualification imparted by the hot cell and high bay access orientation/training does not indicate that "changes to the General Employee Training" are "included in continuing training programs" as required by DOE O 5480.20A [Chapter I.7.e.(4)].

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16. The Training Coordinator provided an incomplete “4501 Conversion Project Training Matrix” for review. This Matrix lists personnel grouped by Operations, Radiological Control Technicians, Technical Support Staff, General Management and Maintenance & Support. Three distinct positions were further identified in the Operations category—Supervisor, Hot Cell Operator, and Manipulator Operator. For each person/group, the Matrix will identify general training requirements, supervisor training, on-the-job training, drill participation, classroom instruction/self study, and required reading. (Listed requirements were those identified in the qualification cards for operations personnel.) The Training Coordinator explained that this Matrix was first developed as a “tickler” to use in visually tracking qualification status. The Project Director, however, had recently determined that this Matrix be more completely developed as a management tool to define training and qualification program requirements. With input from the Project Director and Deputy Project Direct, the Training Coordinator was completing sections of the Matrix pertaining to personnel other than operators and supervisors.
17. The Training Coordinator provided sufficient evidence that the on-the-job training and operational evaluations are firmly based on approved operating procedures. Terminal training objectives are related to the operations described by each procedure and enabling objectives are tied to the primary tasks described by the procedure. Task elements, then, are related to the action steps. This information is managed in an electronic task-to-training matrix.
18. The Training Coordinator stated that facility specific training had not been firmly defined for Radiological Control Technicians.
19. The ORNL Nuclear Materials Control & Accountability Coordinator confirmed qualification of the project Material Balance Area (MBA) Representative and Alternate MBA Representative.
20. Although individual training files are currently being assembled as training and qualification activities are being conducted and completed, the record requirements of DOE O 5480.20A and flow-down of these requirements in the TQPP are being adequately addressed. The OJT/JPM records were filed in groups according to the procedure that was the subject of the training. The assessment team member acknowledges that individual training records may be interfiled for retrieval by the person’s name/badge number or by training program.
21. Memoranda of understanding (MOU) have been established to define responsibilities for the operating division and support organizations for qualification of support personnel. These agreements, referenced in the TIM table, were approved in May 2001 by the Chemical Technology Division and the following divisions:
- Operational Safety Services Division, for qualification Radiological Control Technicians
 - Instrumentation and Controls Division, for qualification of controls and instrument technicians
 - Facilities and Operations Directorate (approved by the manager of Craft Resources Division), for qualification of maintenance and crafts support personnel.

The language in these service agreements is that developed by the Nuclear Facility Training Managers Working Group in spring 2001. The goal of this development effort was to ensure that certain elements were addressed consistently by all ORNL Nuclear facilities initiating these

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types of agreements. Basically, the support organization is responsible for training personnel in their area of expertise and for any corporate environmental, safety, and health training specified by the operating organization. The operating organization is responsible for supplementing this with facility-specific training and determines final qualification to perform work.

The Training Coordinator stated that facility access orientation/training is the primary facility-specific training provided to support personnel. Without this training, support personnel would be escorted for the work that they were doing. Proximity card access control based on completion of training helps to ensure that persons have this facility-specific qualification. The Operations Manager also explained that through job-specific briefings conducted as a part of the work control process, support personnel are provided specific training for any work performed on safety systems, structures or components.

Since approval of the service agreements, organizational changes have occurred so that the current executing organizations and managers are not named in the agreements. Although the assessment team understands that the current organizations and managers are honoring these service agreements, the need to revise these documents as soon as practical is recognized. Since controls and instrument technicians are now a part of the Facilities and Operations Directorate, the agreements for qualification of controls and instrument technicians and craft support may be combined into one document.

A fourth MOU approved in 1996 between the Radiochemical Technology Section and the ORNL Health Division specifically applies to fissile material handlers and supervisors at the 3019 facility and is inappropriately referenced in the TIM table.

22. For qualification of controls and instrument technicians, a cancelled Instrumentation and Controls Division procedure is referenced in the TIM table. According to the training coordinator for controls and instrument technicians in the Facilities and Operations Directorate, this document has been revised as a "guideline document" to support a qualification of controls and instrument technicians managed as a local training requirement as defined by ORNL training procedures.
23. References to ORNL MD-153, Occupational Health Program, in the ORNL TIM table should be replaced with the current SBMS program description document.
24. Because the projected dates for compliance with the certification requirements of DOE O 5480.20A are based on the training for the depressurization project only, the title of the TIM table should not reflect that requirements of the Order are being implemented for the "4501 MSRE Uranium-233 Conversion Project." The implication here is that when compliance is achieved as defined by the TIM table, personnel are qualified/certified to perform full-scope Conversion Project operations, and this is not the case.
25. DOE O 5480.20A defines specific requirements for "control manipulations." The Project Operations Manager explained that he and the Training Coordinator discussed this requirement and the definition of control manipulations given in the Order. No control manipulations are identified for the NaF depressurization. The TIM Table indicates that the requirement pertaining to control manipulations is not applicable.

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26. The Training coordinator stated that all three manipulator operations were qualified for incidental overhead crane operation. This statement was confirmed through the ORNL SAP system.
27. The Conversion Project Facility Manager explained that he wears two different hats. He is provisionally qualified as “Core Team 2 Facility Manager” (for the 4501 facility only) by the Non-Reactor Nuclear Facilities Division. He also serves in a capacity of “environmental, safety and health” manager and has responsibilities in configuration management for the Conversion Project. His time is split about “half and half” between the two organizations and functions. In the role of NNFD facility manager, he has responsibility for safety basis compliance. Currently, he does not have a role in determining the qualification of personnel to perform work in the facility. When asked to consider the need for his involvement in these determinations, he acknowledged that through some means he should be able to determine that “what is being done is consistent with the commitment to the safety basis.”
28. The Training Coordinator described the electronic required reading program. Primarily this system is used for administrative procedures and other documents necessary to keep the project team aware of facility activities. (According to the Training Coordinator, a significant change to an operating procedure would be followed by pre-job briefings especially involving the operations staff.) This system distributes documents to predetermined lists of persons. Two primary distribution lists were defined—one for Conversion Project personnel and support staff and a second representing the occupants of Buildings 4501 and 4505. The Training Coordinator noted some system inflexibility in the user’s ability to create custom lists and/or modify the defined lists. He added that they were working to make improvements in this system. The system allows the administrator to define a due date for the required reading and to preface each document with additional information (such as a summary of changes in a revised procedure). The Training Coordinator explained that the absence of a name on a deficiency list is generally used as confirmation that the required reading was completed; a report positively confirming completion of assignment on a specific date is not a feature of the system. The Nuclear Sciences and Technology Division Training Manager monitors this deficiency list weekly and prompts persons to complete reading for which they are delinquent. A deficiency list generated on October 17, 2002, for all unread articles posted less than a year ago but more than 10 days ago included 32 deficiencies involving six persons.

The Training Coordinator stated that he receives electronic mail messages from the Project Document Specialist to issue documents as required reading. He noted that if he has a question about the request, he addresses this with either the Operations Manager or the Readiness Manager. The Document Specialist confirmed that when a new or revised procedure is approved, she sends an electronic mail request to the Training Coordinator to issue the procedure as required reading. She has access to the system and can view the deficiency list. When she has confirmation that persons have completed the assignment (i.e., no deficiencies are identified for the document), she posts the procedure on the web-based delivery system with an “effective date” coinciding with the date that she confirmed the required reading assignment was complete. The Procedure Writer for the project also stated that the “effective date” listed on issued procedures is the date that required reading was completed.

The Conduct of Operations Manual states that the Project Operations Manager “identifies the types of documents that will be included in the conversion activities required-reading files.” The

MSA ASSESSMENT FORM

Functional Area: Training and Qualification (TQ)	Core Requirement Number: CR-3	Date: October 23, 2002
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Operations Manager stated that the training Coordinator “checks with me to see who should have the required reading.” Documents, however, appear to be identified routinely by the Document Specialist and the Training Coordinator.

29. Three project-specific training programs involve classroom delivery—training for the safety analysis report (SAR), technical safety requirements (TSR), and conduct of operations. Lesson plans were not readily retrievable for these courses. The Training Coordinator produced a copy of the training outline and detailed participant booklet for the SAR training. A training outline for the TSR training was also retrieved, but a referenced participant handout was not found. These instructor outlines included basic elements of a lesson plan. Both outlines, however, were marked ‘Draft;’ no management approval was indicated by signature. Attendance rosters from events held on September 11, 2002, for both courses were located. A brief check for operations staff attendance indicated that one of the hot cell operators had not completed the training. The instructor for the SAR and TSR training was one of the “Safety Analysis” staff members identified on the project organization chart. The Training Coordinator was unsure of this person’s qualification as an instructor, but noted that he had personally monitored the training events. The Readiness Manager had conducted the Conduct of Operations Training. The Readiness Manager produced attendance sheets for the training upon request and forwarded these to the Training Coordinator. Eight chapters of the Conduct of Operations Manual (Revision 0) had been selected as the topic of eight training sessions conducted during the period August 7 through August 15, 2001. Training had been conducted on Chapters II, III, IV, VIII, XI, XII, XVI, and XVIII. All of the operators and supervisors had been in attendance at each of the eight sessions with the exception of one manipulator operator whose signature was not on two of the rosters. According to the Training Coordinator and the Readiness Manager, document of the content of the training is represented by each chapter of the manual; no lesson plan was prepared. The Readiness Manager was a qualified instructor during the time that he conducted the training.
30. The Project Director appropriately stated his responsibilities for ensuring personnel qualification/certification for work associated with the project and for approving training materials, but could not definitively identify the positions that require qualification under DOE O 5480.20A. With understanding of this deficiency, the Project Director began to work with training staff to identify positions other than operation staff for qualification during the course of the assessment.

Conclusion:

Due to the number and extent of the findings, this area cannot be considered ready for operation and should be independently verified prior to declaration of readiness.

NOTE: Requirements of DOE O 5480.20A for reexamination and requalification/recertification were not assessed because of the limited scope and duration of the project.

MSA ASSESSMENT FORM

Functional Area: Training and Qualification (TQ)	Core Requirement Number: CR-3	Date: October 23, 2002
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Inspected by: _____ /signature on file/ D. A. White	Approved by: _____ /signature on file/ G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Training and Qualification (TQ)	Core Requirement Number: CR-4	Date: October 21, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Training Coordinator for 4501 NaF Trap Depressurization

Records and Other Documents Reviewed:

- On-the-Job Training and Job Performance Measure (OJT/JPM) for MSRE/CP/014-OPS
- OJT/JPM for MSRE/CP/108-OPS

Evolutions/Operations Witnessed:

None

Discussion:

The operations team demonstrated a high level of knowledge and impressive skill in performance of routine operational procedures. Drills that were observed indicated readiness to handle abnormal events and emergency situations. Interviews with project personnel conducted during the course of evolutions and drills support a determination that there is an adequate understanding of the system and operations. Attention to safety and the core functions of integrated safety management were also observed to be good in practical application.

The Training Coordinator stated that the written examinations for certification of the operators and supervisors have not yet been developed. Neither have questions been developed to support administration of oral board examinations.

Job Performance Measures (JPM) administered following on-the-job training were determined sufficient operational evaluation tools to establish an adequate knowledge and skill for performance of the tasks defined by the operating procedures. The trainee signs each JPM with acknowledgment of confidence in his/her ability to perform the tasks. The trainer signs the JPM recommending the person for qualification. The Operations Manager qualifies the person for the tasks that are covered by the JPM.

Conclusion:

MSA ASSESSMENT FORM

Functional Area: Training and Qualification (TQ)	Core Requirement Number: CR-4	Date: October 21, 2002
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Although a high level of knowledge and skill were demonstrated by the operators and supervisors as evolutions were observed, testing of knowledge by written examinations and oral boards for certification has not been completed. Test questions have not yet been developed to support these activities.

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MSA ASSESSMENT FORM

Functional Area: Training and Qualification (TQ)	Core Requirement Number: CR-5	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Training Coordinator for 4501 NaF Trap Depressurization

Records and Other Documents Reviewed:

- *Training and Qualification Program Plan for the Building 4501 Conversion Project, Revision 1, dated February 4, 2002*

Evolutions/Operations Witnessed:

None

Discussion:

The Training and Qualification Program Plan does not specifically establish a process for ensuring that facility and operational changes are evaluated for potential impact on the training and qualification of staff. The Training Coordinator described his involvement in the process for operating procedure changes to determine impact on the training and qualification program. He is on distribution (information copy) for all proposed changes to project procedures and has opportunity to make comments if needed. After changes are incorporated and comments are resolved, he determines whether changes affect any of the task elements defined in the on-the-job training and job performance measures used to support personnel qualification. According to the Training Coordinator, procedure verification/validation sessions conducted either in a field setting and pre-job briefings were the primary mechanisms to ensure that the project team was aware of the changes. The Training Coordinator explained that the small size of the project team made this possible.

Note: See also the discussion of required reading under Core Requirement 03.

Conclusion:

Operational changes are accompanied by adequate involvement of the Training Coordinator to determine potential impact on training, make necessary modifications to the training program, and involve staff in retraining, pre-job briefings, or required reading. Consideration should be given to describing and establishing this process for evaluating facility/operations modifications for training implications in the Training and Qualification Program Plan.

Inspected by: <u> /signature on file/ </u> D. A. White	Approved by: <u> /signature on file/ </u> G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-6	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility and equipment, and observed evolutions as indicated below.

Personnel Contacted/Position:

- Conversion Project Operations Manager
- Conversion Project Operations Supervisor

Records and Other Documents Reviewed:

- MSRE/CP/108-OPS, *Depressurization of Building 3019 NaF Traps*
- MSRE/CP/014-OPS, *Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier*

Evolutions/Operations Witnessed:

- Completion of prerequisite steps for depressurization of NaF traps
- Movement of carrier from loading dock to the high bay area
- Transferring trap in overpack from carrier to cell
- Hook up of NaF trap
- Depressurization of NaF trap

Discussion:

Minimum staffing requirements spelled out in the SAR/TSR were addressed in each of the procedures. These requirements were based on the minimum staffing required to take actions identified in the safety analysis. They do not identify the actual minimum staffing to perform the procedures, which would be better information. Implementing the requirements of the SAR/TSR would still be accomplished since the true minimum number to perform the procedures would bound the minimum identified in the SAR/TSR.

Although not addressed in the Conversion COO Manual, DOE Order 5480.19 states that the operations supervisor should be provided with sufficient resources in materials and personnel to accomplish assigned tasks without requiring excessive overtime by the operations staff. The current team makeup allows for some flexibility in performing all but the carrier movement procedure. If one team member is absent carrier movement cannot be performed. Additionally, if at any time it was needed current staffing could not support multi-shift operations.

There is no staffing plan for forward planning to supplement the current staffing level allowing more flexibility. Additionally, long term planning should consider additional staffing to provide for absences during periods of operation.

This element also requires achieving and maintaining training of all shift positions including any qualification requirements. At the time of the MSA, qualifications could not be verified for any of the shift positions.

MSA ASSESSMENT FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-6	Date: October 23, 2002
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Conclusion:

This core requirement could not be verified since the prerequisite for completion of the training matrix was not accomplished.

Inspected by: <u> /signature on file/ </u> P. B. Clark	Approved by: <u> /signature on file/ </u> G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-7	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Conversion Project Safety Analysts
- 4501 Facility Manager
- 4501 Fire Protection Subject Matter Expert
- Conversion Project Document Manager
- 4501 Local Emergency Supervisor
- Nuclear Criticality Safety Representative
- Conversion Project Procedure Writer
- Manager, Nuclear and Facility Safety Services

Records & Other Documents Reviewed:

- ORNL/4501CP/SAR, Revision 1, *Safety Analysis Report for the Building 4501 Conversion Project*
- ORNL/4501CP/TSR, Revision 1, *Technical Safety Requirements for the Building 4501 Conversion Project*
- *Safety Evaluation Report, Revision 1 for the 4501 SAR and TSR*, (including DOE comments and resolutions), and transmittal letter, dated August 21, 2002, from George J. Malosh to William J. Madia
- USQD/4501CP/02-34, Revision 0, *USQD Change Package for the Trap Depressurization Only*
- Conversion Project SAR/TSR Implementation Check Sheet R0
- *Authorization Agreement for the Building 4501 Conversion Project*, Revision 1
- MSRE/CP/036-SUR Revision 1, *Surveillance Requirements*
- MSRE/CP/037-OPS Revision 1, *General Operations with Surveillance Requirements*
- NCSA-85, *4501 CP Operations in Cell D*
- NCSA-86, *Transportation Operations for the 4501 CP*
- Subject Area Nuclear Criticality Safety of SBMS
- DOE O 420.1A, *Facility Safety*
- MSRE/CP/025-ADM, Revision 1, *Job Hazard Evaluation*
- *Job Hazard Evaluation* for MSRE/CP/036-SUR and MSRE/CP/037-OPS
- MSRE-CP/039-OPS, Revision 0, *Cell D Preparation and Close-Out*
- *Job Hazard Evaluation* for MSRE/CP/039-OPS

Evolutions/Operations Witnessed:

None

Discussion:

1. Verified that the five ORR prerequisites for Core Requirement 7, listed in the plan of action, have been met.

MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-7	Date: October 23, 2002
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2. Verified that SAR, Revision 1, and TSR, Revision 1, had been approved by DOE and issued. It appears that all significant hazards were identified in the SAR and appropriate controls were specified in the SAR and TSR.
3. Verified that the Authorization Agreement (AA), Revision 1 had been approved by DOE and issued.
4. Verified that DOE SER, Revision 1, had been issued. SER had only one condition of approval (which did not require SAR or TSR revision or any action prior to CP startup).
 - Reviewed all of the DOE SAR/TSR comments and resolutions attached to SER and verified that all of a sample of SAR revision commitments were incorporated in issue SAR, Revision 1.
 - DOE comment #8 required additional safety structures, systems, and components (SSCs) to be reviewed by fire protection SME “to ensure adequate fire protection prior to the start of operations.” The CP plans to accomplish this review during the R1 revision of the 4501 Fire Hazards Analysis that began October 16, 2002.
 - Response to DOE comment #28 commits to tracking the radioactive material inventory outside the hazard Category 2 (CP) area [for the purpose of remaining below HC3 and posing only insignificant consequence potential when compared with CP activities]. The CP is conducting a 100% re-inventory, which is not yet completed.
5. None of the above CP safety basis (SB) documents have been tailored or restricted to just depressurization activities even though depressurization is the only scope DOE has authorized by project direction. The scope is somewhat restricted by the operational mode of STANDBY in which the depressurization will be performed.
6. CP has issued a SAR/TSR implementation plan (IP). All IP items have been completed.
 - CP database of procedural commitments made in the SAR was reviewed. Verified that all of a sample of such commitments was actually contained in CP implementing procedures.
 - Verified that all TSR Limiting Conditions of Operation (LCOs) were contained in implementing procedures MSRE/CP/036-SUR and MSRE/CP/037-OPS. Noted that the SAR and TSR, listed as references in Section 3 of both procedures, need to have their revision number specified.
 - Verified that all of a sample of Work Packages (WP) on a list provided by the CP safety analysts had accompanying USQDs. Noted that the only controlled set of USQDs and USQ Screens for the CP was maintained by an individual in ORNL Records located outside 4501 in 4500N. USQDs and USQ Screens were not accessible from the CP web. As a result, CP safety analysts maintained their own uncontrolled sets of USQDs and USQ Screens for their use in preparing subsequent USQDs and SAR revisions.

MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-7	Date: October 23, 2002
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- Verified that all of a sample of Deviation Requests (DRs) on a list provided by the CP safety analysts had accompanying USQDs or USQ Screens. Future DRs requiring action to resolve will be addressed via a WP.
 - CP safety analysts were interviewed about their review of Nonconformance Reports (NCRs). They stated that NCRs have a mandatory approval block for CP safety analyst review for the need to perform a USQD.
 - Verified that the CP safety analysts had used a list of Test Discrepancy Reports and Equipment Deficiency Lists to generate USQDs or USQ Screens.
 - Reviewed record sheets completed by CP safety analysts for their walkdown of general CP building spaces to verify consistency with SAR. Noted that Cell D was not walked down. Reason provided was the rigorous configuration management in force for that area. Reviewed the three discrepancies noted during their walkdown and confirmed that they were minor.
 - CP safety analysts were interviewed about their review of Research Safety Summaries (RSSs) for the impact of non-CP activities in 4501 on the CP. The 4501 Facility Manager confirmed that he is in approval path for future RSSs and reviews them with the CP in mind.
 - CP safety analysts were interviewed about their review of Maintenance Job Requests (MJRs) for impact on the CP. The 4501 Facility Manager confirmed that he is in the approval path for future MJRs and reviews them with the CP in mind. He said he was not accountable for that as a facility manager for the Non-reactor Nuclear Facilities Division (NNFD), but had a dual role as the CP Configuration Manager.
7. Verified that safety SSCs were identified in SAR.
 8. Verified that Job Hazard Evaluations (JHEs) for the following operating procedures were issued: MSRE/CP/014, 033, 036, 037, 039, and 108. JHEs for all of a sample of operating procedures (036, 037, and 039) were reviewed and verified that they appropriately identified hazards and controls. MSRE/CP/039-OPS was reviewed and noted that it included the hazards and controls in the body of the procedure, which is a good practice. Also noted that MSRE/CP/039-OPS addressed safety basis and nuclear criticality safety requirements. (Review of MSRE/CP/036 and 037 for safety basis requirements was addressed above in item 6.)
 9. The USQD Change Package for the Trap Depressurization Only was reviewed and determined to be adequately scoped to support trap depressurization.
 10. The *4501 Local Emergency Manual*, Revision 3, dated January 1999, was reviewed. It was noted that most information appeared to be complete and up to date. The manual was loose-leaf and had been updated with inserts as recently as October 2002, but had not undergone a general document revision. The manual incorporated the appropriate DOE guidance as source documents with one exception. DOE Order 5481.1B was cited as the source for a scheme of non-radioactive hazard categorization employing low, moderate, and high designations. That order was cancelled in 1995 and those non-radioactive hazard categorizations are no longer supported by the current ORNL Standards Based Management System. The training records in the manual of the supervisor and squad members dated 2002

MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-7	Date: October 23, 2002
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were reviewed. The records in the manual that document at least three local drills conducted since 2000 were reviewed. Local hazards information from the latest SAR was included for the CP portion of the building. Non-CP hazard information was based on HS/4501/F/CD-4/R1, dated June 24, 1996, which was out of date for the radioactive inventory. (See item 4, bullet 3 above). The Emergency Action Level matrix was dated August 2002 and was based on the Emergency Preparedness Hazard Assessment, Revision 1, that had just been approved by DOE, but not yet officially issued for use or posted on the web. The matrix appropriately addresses containment failure, fire, and sabotage.

11. The NCS representative and procedure writer were asked how all the NCS requirements are implemented. The NCS representative provided the Subject Area (SBMS) documentation for Subject Area: Nuclear Criticality Safety for *Procedure: Implementing NCSAs*, which states:
 - “The operating organization ensures appropriate operating procedures include NCS requirements and have been reviewed by the OSSD NCS Group.
 - The operating organization ensures that all NCS approval requirements have been implemented. Effective implementation of passive and active engineered controls, and administrative controls should be verified. Assumptions explicitly stated in the NCS approval document should be verified valid.”
12. Review of DOE O 420.1A showed that documentation of implementation of the limits and controls identified by NCS evaluations was a requirement of the NCS program.
13. Discussions with NCS personnel and their management concluded that the NCS Program did implement the DOE Order, but was not as clear as necessary pertaining to implementation responsibilities.

Conclusions:

1. The safety basis and authorization agreement are issued. The safety basis is implemented and the USQ process is being used to maintain it current.
2. The safety basis still addresses the entire scope of the original Conversion Project mission instead of being tailored or restricted to just depressurization activities. The scope is somewhat restricted by the operational mode of STANDBY in which the depressurization will be performed.
3. Job hazard evaluations were adequate for project procedures.
4. Conversion Project personnel are working to complete a few open items before startup, e.g., revising the Fire Hazards Analysis to address additional safety SSCs, updating the non-Conversion Project building radioactive inventory, and finishing the revision of the Local Emergency Manual.
5. Conversion Project safety analysts use uncontrolled copies of USQDs and USQ screens for reference in preparing new USQDs and screens and revising existing ones. A controlled distribution of those documents should be made to the limited set of users who need them as part

MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-7	Date: October 23, 2002
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of the safety basis.

6. Per SBMS, Operations is responsible for implementation of NCS requirements and has not provided documentation ensuring implementation.
7. The SBMS documentation for Subject Area: *Nuclear Criticality Safety*; Procedure: *Implementing NCSAs* should be revised to reflect the documentation requirement of implementation.

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MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-8	Date: October 22, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Conversion Project Lead Test Engineer
- Conversion Project Safety Analyst
- Conversion Project Work Package Planner
- Conversion Project Maintenance Coordinator

Records & Other Documents Reviewed:

- MSRE/CP/018-ADM, Revision 3, *Conversion Project Testing Program*
- CERS/MSRE/TI/002, *Conversion Project Electrical Testing*
- CERS/MSRE/TP/003, *Integrated Testing Test Package*
- MSRE/CP/TI/008, *Testing of Positive Off Heater Control for Thermal Cryostat and Desorb Stations*
- CERS/MSRE/TP/007, *Differential Pressure Alarm Circuit Test Package*
- MSRE/CP/TP/009, *Depressurization Procedure Test in Building 4501 Test Package*
- Printout dated October 7, 2002 from Conversion Project deficiency database tracking Equipment Deficiency List and Testing Deficiency Report
- MSRE/CP/003-ADM, Revision 2, *Conversion Project Facility Work Authorization*

Evolutions/Operations Witnessed:

None

Discussion:

1. Verified that the four ORR prerequisites for Core Requirement 8, listed in the plan of action, have been met.
2. Pre-operation/startup tests have all been completed on both components and integrated systems.
3. The test program procedure, MSRE/CP/018-ADM, appears to include the steps for a thorough, well-coordinated testing program.
4. Test engineers and design engineers appear to have been appropriately involved in the planning and execution of pre-operation tests.
5. Test package records are currently maintained by the lead test engineer who plans to turn them over to the Conversion Project (CP) document management center soon.
6. Five test instructions and test packages for procedural compliance were reviewed. Test plans, instructions, logs, results, test change notices, test deficiencies, and job hazard evaluations were included as required. Most recent test (conducted August 5-7, 2002), MSRE/CP/TP/009, successfully checked out MSRE/CP/108-OPS using a NaF trap with 100g of depleted and natural

MSA ASSESSMENT FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-8	Date: October 22, 2002
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U pressurized to 200 psig.

7. Reviewed one selected test instruction, CERS/MSRE/TP/007 and verified that it included the appropriate TSR alarm setpoint. Reviewed the accompanying test package and verified that it documented the successful operation of the alarm.

8. A few hundred test deficiencies were generated during testing. One test, CERS/MSRE/TP/003, spanned six months and generated over 200 deficiencies. A CP database, used to track these and other equipment deficiencies that are noted during CP activities, was reviewed. About 46 of these items remain open of which approximately 28 were judged by the Conversion Project to need closure before depressurization activities begin with fissile material. These open test deficiencies were estimated by the Conversion Project to require about three months to close. Reviewed test instructions and packages and verified that sample of test deficiencies were included in database with correct closure status. Noted that closure timing requirement (e.g., prior to ORR) had been modified for a few entries in database from deficiency form in package. Lead test engineer said that CP management team made such decisions.

9. The maintenance coordinator was interviewed about his role in executing MSRE/CP/003-ADM. Confirmed that he tracks, via a log, all CP work packages, including those issued for maintenance. He and his staff assist in closure of work packages and maintain records until they are turned over to the CP document management center. (Review of sample of work package will be described under assessment form for CR-9.)

10. Reviewed surveillance procedures MSRE/CP/036-SUR and MSRE/CP/037-OPS and verified that they had been performed currently with satisfactory results to confirm operability for the STANDBY mode entered for the MSA evolutions.

11. Reviewed MSRE/CP/003-ADM and verified that Step 6.6.3 requires that “the Task Leader ensures any applicable post-maintenance tests are included in the work package.”

Conclusions:

1. Preoperational testing has been satisfactorily completed. Conversion Project personnel are working to close several remaining test deficiencies before startup.

2. Surveillance testing has been satisfactorily completed for the STANDBY mode of operation.

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MSA ASSESSMENT FORM

Functional Area: Startup Test Program (STP)	Core Requirement Number: CR-9	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility and equipment as indicated below.

Personnel Contacted/Position:

- Conversion Project Configuration Manager
- 4501 Facility Manager
- Conversion Project Maintenance Coordinator
- Conversion Project Work Package Planner
- Conversion Project Document Manager
- Conversion Project Safety Analysts

Records & Other Documents Reviewed:

- MSRE/CP/001-ADM, Revision 2, *Development, Review, and Control of Procedures and Documents*
- MSRE/CP/003-ADM, Revision 1, *Conversion Project Facility Work Authorization*
- MSRE/CP/017-ADM, Revision 1, *Conversion Configuration Management*
- MSRE/CP/035-ADM, Revision 1, *Conversion Project Configuration Item List*
- Internal memo from J. E. Rushton to Conversion Project Team, dated June 25, 2002, Appointment of MSRE U233 Conversion Project Configuration Control Board
- Notes from meeting of Conversion Project Configuration Control Board dated June 17, 2002; July 23, 2002; August 26, 2002; September 16, 2002; October 3, 2002; and October 9, 2002
- Printout dated October 17, 2002 from Conversion Project Work Package Log
- Conversion Project Work Packages #4, 11, 18, 35, and 49
- *USQD Screening Work Sheet for Revised Document Numbers for Two Transportation Plan Reports Referenced in the SAR for the Building 4501 Conversion Project*, USQDSCR/4501CP/02-01, Revision 0
- *USQD Screening Work Sheet for Revisions to the Document Titled Fabrication Package Documentation Requirements for the MSRE Conversion Project*, USQDSCR/4501CP/02-06, Revision 0
- *USQD Screening Work Sheet for Review of Operating Procedure Document, Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier (MSRE/CP/014-OPS)*, USQDSCR/4501CP/02-09, Revision 0
- *USQD Screening Work Sheet for Installation of Silicone Foam Sealant to Seal Cell D Structural Wall Penetrations*, USQDSCR/4501CP/02-27, Revision 0
- *USQD Screening Work Sheet for Impact of Hydrogen Fluoride Handling and Adsorption Tests on Building 4501 Conversion Project (CP)Activities*, USQDSCR/4501CP/02-43, Revision 0
- ORNL-FS-P01, Revision 5, *ORNL Unreviewed Safety Questions for Nuclear Facilities*

Evolutions/operations witnessed:

None

Discussion:

1. Verified that the first four ORR prerequisites for Core Requirement #9 have been met. Verified

MSA ASSESSMENT FORM

Functional Area: Startup Test Program (STP)	Core Requirement Number: CR-9	Date: October 23, 2002
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that the startup testing program portion of the fifth prerequisite appears to have been well planned, conducted, and documented. Did not verify that “depressurization activity equipment is designed, installed...and engineering drawings [and] fabrication packages...required for startup are complete”.

2. The Conversion Project Configuration Manager (CM) was interviewed about his role in executing MSRE/CP/001-ADM, MSRE/CP/003-ADM, and MSRE/CP/007-ADM. (He also serves a dual role as 4501 Facility Manager (FM), so he will be referred to here as the CM/FM.) Confirmed that he understands the Configuration Management Program and his role.
 - Confirmed that the only role required for the CM by MSRE/CP/001-ADM is to review and sign notices of cancellation for procedures. By that procedure, he is not required to be involved in the development of new procedures or revisions of existing procedures. (By contrast, he plays a key role in the configuration management of hardware changes governed by MSRE/CP/003-ADM.) For procedures, his roles of ensuring that the safety basis is maintained through the USQ process and that nuclear criticality safety (NCS) documentation is preserved for new or revised procedures are assigned to “procedure development” and the Technical Manager. It would appear that assigning those roles to the CM in MSRE/CP/001-ADM would be more consistent with his intended function for the Conversion Project. It should be noted that the CM/FM stated that, in practice, he is involved in the review of new and revised procedures because he is also the 4501 Facility Manager. However, MSRE/CP/001-ADM does not assign any role to the FM.
 - MSRE/CP/003-ADM, Revision 2, does not contain a revision log so it was not evident when it was originally issued and effective. Neither the CM/FM or Document Manager knew when it was originally issued but indicated that it had not been effectively executed until about six months ago when certain CP responsibilities were reassigned, including the CM position, and a work package planner was hired. The Document Manager stated that a project decision had recently been made to begin including a revision log with each procedure revision.
 - In the execution of MSRE/CP/003-ADM, the CM/FM confirmed that he determined whether a configuration item (CI) was involved, whether the work package (WP) was Type A, B, or C, (Type A is a modification to a configuration item), and whether the unreviewed safety question (USQ) process needed to be invoked. He also confirmed that he convenes a Change Control Board (CCB) for Type A WPs.
 - In order to accurately determine whether a CI is involved in the work activity, consideration should be given to whether the activity could indirectly affect the CI or one of its required supporting structures or systems, as well as whether it could directly involve the CI. For his determination of whether a CI is involved, the CM/FM stated that he reviewed the work request for a description of the work and the systems, structures, and components (SSCs) affected and talked with the WP requester for more information. He also consults a schematic drawing that shows the boundary of CI systems. The CM/FM then assesses whether the work activity is a modification (Type A WP) or repair (Type B WP) and then documents his determination of WP type in block 7 of the work request form (Appendix 8.1 of MSRE/CP/003-ADM).
 - CIs are documented in MSRE/CP-035-ADM and are consistent with the SAR. Appendix 8.5 of MSRE/CP/003-ADM also lists “SSCs Requiring a Type A or B Work Package,” that is intended to be equivalent to the list of CIs. However, the list in Appendix 8.5 does not list or

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Functional Area: Startup Test Program (STP)	Core Requirement Number: CR-9	Date: October 23, 2002
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reference the design features required for nuclear criticality safety as does MSRE/CP/035-ADM. Just referring to MSRE/CP/035-ADM and deleting Appendix 8.5 could eliminate the discrepancy.

- The CM/FM confirmed that he determines whether the work activity requires the USQ process to be invoked. This is a role assigned to the FM by MSRE/CP/003-ADM for the initial WP and to be documented in block 8 of the work request form. The CM/FM also confirmed that he determines which other ESH disciplines (e.g., NCS) need to be involved in the work activity. This is a role assigned to the FM by MSRE/CP/003-ADM and to be attested to by signature in part 3 of the work authorization form (Appendix 8.3). However, the review of subsequent changes to the WP for re-entry into the USQ process, as well as whether the job hazard evaluation (JHE) or NCS documentation require revision is assigned to the Conversion Project Operations Manager and to be documented on the “WP Change Information Sheet” (Appendix 8.7 of MSRE/CP/003-ADM). It would appear to be more consistent with the FM’s role in the initial WP if those responsibilities were assigned to the FM.
- The language on the WP change form (Appendix 8.7 of MSRE/CP/003-ADM) in question IV (a), “Could the change [in the WP activity] affect a physical change to systems described in the SAR of TSR” is too narrow to adequately be used to determine whether the change to the WP needs to be re-evaluated by the USQ process. The CM/FM stated that he had already drafted a proposed question to replace IV (a) with “Is it a physical change from that considered in the USQD?” Such a change would be satisfactory along with assigning the responsibility for making that determination to the FM (see item above).
- The CM/FM stated that he fulfills his responsibility for ensuring that “all ESH requirements” are met by examining the information in part 2 of the work authorization form, reviewing the required ESH documents contained in the WP, and by referring to the WP document index (Appendix 8.4).
- The CM/FM stated that he considers himself as the “owner” of MSRE/CP/017-ADM. The procedure does not have a revision log so it was not evident when it was originally issued and effective. The CM/FM did not know when it was originally issued but indicated that it had not been effectively executed until a few months ago. He provided an internal project memo, dated June 25, 2002, that reassigned the role of CM to him and named members to the project configuration control board (CCB).
- The CM/FM stated that the CCB had met six times under his direction to consider seven Type A WPs and provided notes from those meetings. He indicated that the CCB is convened whenever he decides that enough is known about the work activity to have a meaningful discussion but before work planning proceeds too far for the CCB input to be of value. He indicated that the CCB activity has aided communication among project and support personnel and added value. (As an aside he added that he had recommended unsuccessfully that the Non-reactor Nuclear Facilities Division require the CCB activity, but it was left optional in their procedure.) He stated that all configuration management documentation required by MSRE/CP/017-ADM is included in Type A WPs.
- Section 6.2 of MSRE/CP/017-ADM addresses material procurement and refers to MSRE/CP/035-ADM “for identification of GEN-6 procurement grade levels for Conversion

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Project CIs". However, MSRE/CP/035-ADM does not mention procurement grade levels. When questioned about this, the CM/FM also noted that GEN-6 (Nuclear Science and Technology *Procedure for Procurement of Items and Services*) had been cancelled. Valid references should be provided or procurement guidance provided directly in this section.

3. A sample of closed work packages that involved work on CIs was reviewed for compliance with MSRE/CP/003-ADM, proper designation of WP type, and proper determination about entry into the USQ process. WP #4 was to replace HEPA filters with acid-resistant filters. The WP was designated as Type A, but no USQD was judged to be required because the replacement was being undertaken in order to comply with SAR requirements. WP #11 was to replace the housing for HEPA filters in the process off-gas system. It was designated as Type A, but no USQD was judged to be required because it was being undertaken to restore the system to the leak-tightness specified in the SAR. WPs # 18, 35, and 49 all were Type A and had USQDs in their documentation. All five of these WPs appeared to contain all of the expected, documents such as work request form, work authorization form, JHE, work instructions, pre-job briefing record, CCB notes, and drawings.
4. Two Conversion Project safety analysts were interviewed and confirmed that they understand their role in preparing unreviewed safety question (USQ) screens and determinations (USQDs) in support of the project configuration management program. A sample of USQ screens (USQDSCR/4501CP/02-01, 06, 09, 27, and 43) addressing SAR changes, procedure changes, maintenance, and testing were reviewed and verified that they were all technically adequate and met the ORNL procedure, ORNL-FS-P01. (As part of non-MSA duties, reviewer has approved many Conversion Project USQDs, thus verifying their technical adequacy and procedural compliance.) One safety analyst indicated that no USQs had been determined to exist to date for the Conversion Project. The safety analyst also indicated that no ongoing USQ process activities were anticipated to significantly impact the start up of Conversion Project operations.
5. The Conversion Project Maintenance Coordinator was interviewed and he stated that no temporary modifications had been designated to date.

Conclusions:

1. Conversion Project personnel associated with the configuration management of safety SSCs and procedures are knowledgeable and effectively executing the program at the present time. In particular, the Conversion Project is effectively implementing the USQ process.
2. Several of the procedures (MSRE/CP/001, 003, and 017-ADM) need improvement for consistency in the role of the Conversion Project Configuration Manager and accuracy in references.

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Inspected by: <u> /signature on file/ </u> D. G. Renfro	Approved by: <u> /signature on file/ </u> G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-10	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility and equipment, and observed evolutions as indicated below.

Personnel Contacted/Position:

- Operations Manager
- Readiness Manager
- Conversion Project Operations Supervisor
- Conversion Project Procedure Writer
- Conversion Project Hot Cell Technical Operator

Records & Other Documents Reviewed:

- MSRE/CP-033-OPS, *Hot Cell D, Building 4501, Procedure for Insertion and Removal of Item(s) and/or Sample(s), Revision 2*
- MSRE/CP-014-OPS, *Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier*
- MSRE/CP-108-OPS, *Depressurization of Building 3019 NaF Traps*
- MSRE/CP-001-ADM, *Development, Review, and Control of Procedures and Documents*
- MSRE/CP/004, Revision 1, *Building 4501 Conversion Project Conduct of Operations Manual*
- SBMS-Internal Operating Procedure, *Procedure: Writing, Controlling, Reviewing, and Using Internal Operating Procedures*
- MSRE/CP/004, Revision 1, *Building 4501 Conversion Project Conduct of Operations Manual*
- NCSA-85, *4501 CP Operations in Cell D*
- NCSA-86, *Transportation Operations for the 4501 CP*
- MSRE/CP-039-OPS, Revision 0, *Cell Preparation and Close-Out*
- MSRE/CP/037-OPS, Revision 1, *General Operations with Surveillance Requirements*
- MSRE/CP/036-SUR, Revision 1, *Surveillance Requirements*

Evolutions/operations witnessed:

- PODs
- Pre- and post-job briefings
- Prerequisites for Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier
- Preparation for Operations Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier
- Transfer of the Carrier from the 4501 Loading Dock Area (LDA) to the High Bay Area (HBA)
- Transfer of Container in Carrier from HBA to Hot Cell D
- Prerequisites for Operations of Depressurization of Building 3019 NaF Traps
- Preparation for Operations of Depressurization of Building 3019 NaF Traps
- Placing gas supply system into an idle condition
- Connection of NaF Trap

Discussion:

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1. Reader/Worker technique was used for MSRE/CP/108 and MSRE/CP/014 procedures. The operators and supervisor were very proficient with the technique. An unexpected condition was noted by the operator with Trace Heater control in Manual position and needed to be in Auto position. Personnel took the correct actions and notified electrical support. The unexpected condition was corrected.
2. MSRE/CP-108-OPS utilized the reader/worker technique, but there was no requirement for this formality. In reviewing the SBMS for Internal Operating Procedures there was no categorization of procedures, (i.e. Cat.1, Cat.2, Cat.3). Further discussions with the Readiness Manager determined that the reader/worker technique was the expected method for this operation. There is no documented requirement for the use of the Reader/Worker technique for the CP personnel. Since this is the expected method, it should be documented so all personnel understand the expectation of the project.
3. Operations personnel did not follow the MSRE/CP/001-ADM procedure for determination of a controlled copy of a procedure. The procedure required CP personnel to “(ensure) procedures, Standing Instructions, or other controlled documents are current versions prior to performing work”. This is accomplished by using a “Controlled Copy” or a “Verified Copy” either of which is a document printed from the web. A Verified Copy is a copy of a document printed from the most recent web version which has been signed and dated by an authorized user. Signed and dated Verified Copies are considered Controlled Copies.

Both the Readiness Manager and an Operations Supervisor were asked how they determined that the procedure they were using was the most recent. The response from both was, the Procedure Modification log was checked to determine the most recent version. The Readiness Manager explained that there can be as much as a two day-lag between when a procedure is approved and when it is entered onto the web. By checking the Procedure Modification log, the operations personnel can ensure the most recent revision is being used. This method may be considered better than using the web method, but it is not documented. Also, the Operations Supervisor did not document (log entry, signed cover page, etc.) that he had verified that the operating procedure was the most recent version.

Recommendation would be to add a section to the MSRE/CP-001 procedure on procedure use. This could include how to verify a “controlled copy,” what documentation is necessary to verify a “controlled copy,” and other important information.

4. Several procedures were reviewed for incorporation of safety requirements. A complete “cross-walk” of the safety requirements flow down would be useful for verifying that all safety requirements have been implemented. A *Procedural Commitments* matrix was developed for documenting where the Safety Analysis Report (SAR) and Technical Safety Requirements (TSR) requirements were implemented. There was no such matrix developed for the implementation of NCS requirements.
5. There were several observations of good ES&H practices.
 - Once the carrier was secured to the crane hook, the operators distanced themselves from the lift.

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- When moving the dolly, one operator utilized leather gloves, even though this was not called out in the JHE.
 - An operator was observed removing a potentially contaminated piece of blotter paper. He was extremely conscientious on how he folded the paper over to contain any material. He also doffed his gloves properly.
6. There were several minor comments associated with the main operating procedures (MSRE/CP/014-OPS, MSRE/CP/033-OPS, and MSRE/CP/108-OPS). A comment matrix for each procedure was developed and is attached as Appendix D.
 7. The equipment nomenclature between the procedures, status board (drawing), and control cabinets was not consistent. The components and controllers of the components were interchanged. The CP Hot Cell Technical Operator and the CP Operations Supervisor were very knowledgeable of the system components. They did not have any trouble identifying on the control cabinets or the status board the components described by the procedure.
 8. The operating procedures did not address completing the uranium hold-up survey after the last NaF Trap was depressurized since the procedure allows measurements to be done before or after the trap is installed. A final survey is necessary to determine the uranium hold-up for the cell clean-out operations.

Recommendation would be to take credit for the material balance activities that are performed as part of the procedure to implement the uranium hold-up, as opposed to using the radiation survey.

9. Questionable contamination control was observed during the connection of the NaF trap. Step D.8 of Procedure MSRE/CP/108-OPS required that the top of the trap be vacuumed. A small, self-contained HEPA vacuum was used for this task. The tip of the vacuum hose was placed over the top of trap. After the vacuuming was completed, the tip was not wiped. During most of the observed operations care was taken to ensure contamination control (wiping down the overpack, bagging samples and wipes, bagging the overpack lid, etc.).
10. MSRE/CP/014-OPS did not flow well. There were operations occurring in multiple areas of the facility simultaneously. Personnel were not given all their assignments prior to beginning the work. This led to some confusion and time delays on who should be where and doing what steps.

Conclusion:

The prerequisites for Core Requirement 4 were not completed, and the prerequisite of having approved NCSAs for Core Requirement 7 was not completed until October 22, 2002.

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In general, the operating procedures were adequate and implemented the safety requirement of the Project. The surveillance procedures captured the required surveillances and their frequencies. Operations personnel were proficient with their use and understanding of the procedures. The adherence and comprehension of the administrative procedures still needs attention.

Inspected by: <u> /signature on file/ </u> J. G. Ezold	Approved by: <u> /signature on file/ </u> G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-11	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility, and observed evolutions as indicated below.

Personnel Contacted/Position:

- Readiness Manager

Records & Other Documents Reviewed:

- MSRE/CP/108-OPS, *Depressurization of Building 3019 NaF Traps*
- MSRE/CP/031-OPS, *Building 4501 Conversion Project Alarm Response Procedure*
- MSRE/CP/006-ADM, *Conversion Project Drills*
- *Local Emergency Manual for Building 4501*

Evolutions/Operations Witnessed:

- Observed heat trace high temperature alarm drill
- Observed Low Cell Differential Pressure Light/Horn and/or Alarm (PI-D6) drill
- Observed Monitron alarm in Control Room

Discussion:

1. Heat Trace High Temperature Alarm

- Pre-drill Briefing
 - The determination was made to simulate all valve and switch operations. It was not clear whether the development of the drill guide evaluated what actions could have been performed rather than simulated. This is contrary to MSRE/CP/006-ADM, which states that "Simulations shall be minimized. Drills should be maintained as realistic as possible."

The drill coordinator should consider other methods of providing indications, such as pulling a control power fuse or placing a switch in test position to give an alarm condition. Note that this type of initiation must have a backup method for safety monitors to monitor conditions.

- MSRE/CP/006-ADM requires that the Conversion Project (CP) Operations Supervisor and the drill team be briefed prior to the drill. During this briefing, the drill coordinator explains that a drill will be conducted and that any operations needed are to be simulated. He also reminds them to make proper log entries and to preface announcements and phone calls with "This is a drill." Additionally, the entire drill monitor team entered the control room prior to the drill.

These practices eliminate the ability to initiate a drill during the normal flow of work activity. All personnel should be trained regarding how drills are run and not briefed each time. Also, there was no identification for drill controllers and safety monitors. Identification should be provided to prevent confusion on who is and is not a participant.

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Functional Area: Operations (OP)	Core Requirement Number: CR-11	Date: October 23, 2002
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- Drill Performance
 - Drill initiation was good and immediate actions taken were proper. The panel operator and DAQ operator both monitored the temperature after the alarm and when the temperature reached the setpoint. The panel operator tripped the switch. When this did not stop the rising temperature, the panel operator tripped the supply breaker to the heat trace bank. The drill simulation did not indicate that, at that time, all heater traces on the panel had been lost. Additionally, the operations team members made no attempt to monitor other heaters controlled by the same controller. Since there is a single controller for the entire bank of heat traces monitoring, other temperatures may have provided information concerning the cause.
- 2. Low Cell Differential Pressure Light/Horn and/or Alarm (PI-D6)
 - Pre-drill Briefing
 - See above write-up
 - Drill Performance
 - Drill initiation was good and immediate actions taken were proper. The Panel Operator acknowledged and silenced the alarm and read the pressure on both pressure detectors in the Control Room. The operations supervisor sent a second operator to verify the indications on the primary panel in the hallway.
 - The procedure allows for an adjustment in flow at the primary panel in an attempt to correct the problem. The direction was given by the Operations Supervisor to the operator in the hall to attempt the adjustment; however, the operator had not taken the key from the Control Room to unlock the panel.
 - The current form of communications being used by operations is not adequate to control activities outside the Control Room. The operator took a portable phone and called the Control Room on the second line. This resulted in the need for the supervisor to terminate communications with the operator in the hall in order to make necessary notifications. Additionally, the control room does not have direct access to the PA system. Although this is not significant in this situation, in an emergency situation requiring evacuation of the facility, the Operations Supervisor must either call the project office and have an announcement made or exit the Control Room and go to the microphone at the east end of the outside hallway. This delay in response time is not consistent with good ALARA and emergency response practices.
- 3. Monitron alarm in Control Room
 - Pre-drill Briefing

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- Issues raised from the first two drills regarding more simulation than required and too much warning before initiation of the drill were discussed with project management. The determination was made not to conduct a briefing with the operations team prior to the drill and that simulations would only be used when absolutely necessary. The operator would be allowed to trip the emergency stops.
- Drill Performance
 - Upon initiation of the drill, the DAQ Operator responded by reading the meter and determining that the alarm was real. The Panel Operator then tripped both panel emergency trips. The Operations Supervisor directed the immediate evacuation of all control room personnel to move to the closest exit and planned to evacuate without frisking. This was the proper response. The drill monitor stopped them and had them frisk out during a pause in the drill. This was proper drill control.

Once the team left the Control Room, all evacuated the building except the Operations Supervisor who proceeded to the PA microphone to announce the alarm and the building evacuation. Immediately following the announcement, the Supervisor also evacuated the building. The evacuation was completed within five minutes. The operations team segregated themselves until they were frisked as required. The drill response was excellent.

Immediately following the termination of the drill an actual CAM alarm occurred. Again the team's response was rapid and proper.

Conclusion:

The drill program, as implemented, is adequate to satisfy this core requirement. Prerequisite 11-1, completion of a revision the Local Emergency Manual, was not complete.

Inspected by: _____ /signature on file/ P. B. Clark	Approved by: _____ /signature on file/ G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Startup Test Program (STP)	Core Requirement Number: CR-12	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility and observed evolutions as indicated below.

Personnel Contacted/Position:

- Conversion Project Test Engineer
- Conversion Project Readiness Manager

Records & Other Documents Reviewed:

- MSRE/CP/018-ADM, Revision 3, *Conversion Project Testing Program*
- MSRE/CP/032-ADM, Revision 0, *Start-Up Plan for the Depressurization of UF₆ Loaded NaF Traps Removed from the Molten Salt Reactor Experiment Facility*
- Test Packages
- Test Instructions
- Log Entries
- Test Change Notices

Evolutions/Operations Witnessed:

- Prerequisites for Operations of Depressurization of Building 3019 NaF Traps
- Preparation for Operations of Depressurization of Building 3019 NaF Traps
- Placing gas supply system into an idle condition
- Connection of NaF Trap
- Prerequisites for Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier
- Preparation for Operations Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier
- Transfer of the Carrier from the 4501 Loading Dock Area (LDA) to the High Bay Area (HBA)
- Transfer of Container in Carrier from HBA to Hot Cell D

Discussion:

The Test Program document was thorough and well written. The program was applicable to both pre-operational testing and testing for maintenance activities. Job Hazard Evaluations (JHEs) were written for all Test Instructions. The Test Engineer was knowledgeable of the Test Program. All systems and components for the Depressurization Project have been tested and the results documented. Equipment performed as expected during evolutions that were witnessed.

The Start-Up Plan did not provide a clear graded approach to normal operations. The definition of "Evolution" and the use of the Post-Evolution Review Checklist did not allow the flexibility of releasing first-use controls of specific tasks.

There was not a clear line of responsibility for the approval of the release of first-use controls. The Start-Up Plan stated that the Operations Manager and Facility Manager approve the removal of first

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Functional Area: Startup Test Program (STP)	Core Requirement Number: CR-12	Date: October 23, 2002
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use controls, but they are not required to participate in the evolution or the post- evolution review. The Start-Up Plan did not list the responsibility of removal of first use controls to any of the listed positions. The Operations Supervisor is responsible for completing Appendix 3, *Post-Evolution Review Checklist*, and therefore checks whether the evolution was acceptable. Appendix 3 had the following positions Senior Monitor, Operations Manager, Facility Manager, and Project Director concurring via initials not signature.

Appendix 2, *Startup Checklist*, was considered a good tool for documenting the support/operation personnel requirements, documentation requirements, attendance, and notifications. It is recommended that this checklist be utilized in the three main operating procedures: MSRE/CP/014-OPS, MSRE/CP/033-OPS, and MSRE/CP/108-OPS.

Conclusion:

All prerequisites identified in the POA for this CR have been completed.

The testing program has been implemented and all equipment testing has been completed. The Startup Plan has been approved, but improvement is needed for clarity and flexibility.

Inspected by: _____ /signature on file/ J. G. Ezold	Approved by: _____ /signature on file/ G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-13	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, walked down the facility, and observed evolutions as indicated below.

Personnel Contacted/Position:

- Conversion Project Operations Manager
- Conversion Project Operations Supervisors
- Conversion Project Hot Cell Technical Operator
- Conversion Project Hot Cell Manipulator Operators
- Maintenance Coordinator
- Work Package Planning Coordinator
- Conversion Project Readiness Manager

Records & Other Documents Reviewed:

- MSRE/CP/108-OPS, *Depressurization of Building 3019 NaF Traps*
- MSRE/CP/014-OPS, *Loading/Unloading/Movement of MSRE Remediation UF₆ Conversion Shielded Carrier*
- MSRE/CP/001-ADM, *Development, Review, and Control of Procedures and Documents*
- WP-U233-MSRE-050, *Replace Hot Cell D Inlet HEPA Filter*
- CERS/MSRE-017, *Semi-annual Test Hot Cell D HEPA Filters Facility Ventilation*
- CERS/MSRE-014, *Process Valves SV-06 & SV-35 Replace Actuator*
- CERS/MSRE-015, *Repair Process Valves SV-4, SV-12 & SV-13*
- CERS/MSRE-016, *Replace Flexible Piping with Hard Piping*
- CERS/MSRE-003, *Move System to Cell*
- MSRE/CP/004-ADM, *Building 4501 Conversion Project Conduct of Operations Manual*, October 9, 2002
- MSRE/CP/037, Revision 1, *General Operations with Surveillance Requirements*

Evolutions/Operations Witnessed:

- POD Meetings
- Pre- and post-job briefings for each evolution
- Completion of prerequisite steps for depressurization of NaF traps
- Movement of carrier from loading dock to the high bay area
- Transferring trap in overpack from carrier to cell
- Hook up of NaF trap
- Depressurization of NaF trap

Discussion:

1. Conduct of Operations Implementation

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Functional Area: Operations (OP)	Core Requirement Number: CR-13	Date: October 23, 2002
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- Operators, supervisors and managers demonstrated formality and discipline of operations extremely well. The use of reader/worker approach was carried out in a very formal manner with excellent communications from the reader and repeat backs from the worker. Additionally, at two points in the procedure, abnormal conditions arose and the response was proper to ensure plant and personnel safety.
- The project developed a conduct of operations manual and included in the manual a compliance matrix showing procedures that implemented the 18 chapters from DOE Order 5480.19. Additionally, the project conducted training with all project personnel. Based on observation of operations, the training appears to have been very effective.
- Programmatic elements of Conduct of Operations

- Chapter 1 - Organization and Administration

This element was implemented through the Conversion Conduct of Operations Manual (COO), the Conversion Quality Assurance Plan, the Conversion Configuration Management procedure, and the Conversion Facility Work Authorization procedure.

Although not addressed in the Conversion COO Manual, DOE Order 5480.19 states that the operations supervisor should be provided with sufficient resources in materials and personnel to accomplish assigned tasks without requiring excessive overtime by the operations staff. The current team makeup allows for some flexibility in performing all but the carrier movement procedure. If one team member is absent carrier movement cannot be performed. Additionally, if at any time multi-shift operations were required, current staffing would not be adequate.

There is no staffing plan for forward planning to supplement the current staffing level for more flexibility. Additionally, long term planning should be considered to provide for absences during periods of operation.

This element also requires achieving and maintaining training of all shift positions including any qualification requirements. Qualifications cannot currently be verified for any of the shift positions.

- Chapter 2 - Shift Routines and Operating Practices

This element was implemented through the Conversion COO Manual, the Conversion Pre-Job Briefing/Post-Job Debrief procedure, and the Job Hazard Evaluations procedure.

Sufficient procedures are in place to effectively implement this element; however, the Conversion COO Manual Applicability Matrix does not include MSRE/CP/037-OPS, *General Operations with Surveillance Requirements*, even though this document implements shift tours/rounds.

- Chapter 3 - Control Area Activities

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This element was implemented through the Conversion COO Manual.

The Conversion COO Manual provides sufficient guidance for controlling access and expected professional behavior. Observations of several evolutions showed the implementation of these areas was effective. The operations team performed with a high degree of professionalism.

- Chapter 4 - Communications

This element was implemented through the Conversion COO Manual.

Face to face communications were disciplined and formal. The operations team used the reader/worker process in the performance of project procedures. Steps were read by the reader, repeated back by the worker and completion of the step was reported and acknowledged.

Communications equipment was not sufficient for project requirements. The operations team used a multi-set phone system. This tied up one of the Control Room phone lines when in use and the headsets used with the units seem to be unreliable. Also, during one casualty drill an operator took one of these handsets to call into the Control Room with his report. This resulted in both Control Room lines being in use when the supervisor needed to make notifications. This required that communications between the supervisor and the operator in the field be terminated resulting in a loss of control of the situation.

The supervisor controlled all activities from the control room, except some portions of carrier movement operations; however, there is no access to the Public Address system in the control room. In order to make a facility wide announcement the supervisor must leave the Control Room or call the project office outside the RBA and have someone make the announcement. For example, an accident resulting in high radiation areas in a normal evacuation route, e.g., loading dock, people could not be notified to stay clear of that area.

- Chapter 5 - Control of On-Shift Training

This element was implemented through the Conversion COO Manual and Conversion Training & Qualification Plan.

The Conversion COO Manual provides sufficient direction to implement this requirement.

- Chapter 6 - Investigation of Abnormal Events

This element was implemented under the ORNL SBMS through the ORNL *Occurrence Notification and Reporting Procedure*.

The ORNL Procedure adequately implements this requirement, and the Facility Manager and two Conversion Project QA Representatives are current on the required training.

- Chapter 7 - Notifications

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This element was implemented under the ORNL SBMS through the ORNL *Occurrence Notification and Reporting* procedure.

The ORNL Procedure adequately implements this requirement, and the Facility Manager and two Conversion Project QA Representatives are current on the required training.

- Chapter 8 - Control of Equipment and System Status

This element was implemented through the Conversion COO Manual, Conversion Configuration Management procedure, Conversion Facility Work Authorization procedure and Conversion Pre-Job Briefing/Post-Job Debrief Procedure.

The drawing being used for the status of system valves was not verified as the most recent revision. Additionally, although not specifically required by the Conversion COO Manual, the operations team might consider tracking additional information on a status board (e.g., completion of surveillances and results, completion of crane inspections and results, holdup total). If information such as this were maintained on a status board the supervisor would not need to continually refer to supporting documentation.

The Conversion COO Manual required that conversion activities and conversion maintenance activities be listed on the Plan-of-the-Week (POW). The project also lists these items on a Plan-of-the-Day (POD). However, there was no formalized process for development or maintenance of either the POW or POD. By using a formalized process the POD can be used for Conversion Operations Manager Approval to perform activities. Also, the POD would be more useful if certain additional information were included:

- Dated signature of the Conversion Operations Manager
- Y/N column for pre-job briefing required
- Time and location of pre-job briefing
- Y/N column for RWP required
- RWP number
- Columns for estimated start and completion dates

Making the POD a rolling 5 day schedule would also make it more useful by providing a full 5 day look ahead. The current document does not provide any information for the next week until Monday of that week.

- Chapter 9 - Lockouts and Tagouts

This element was implemented through ORNL-SH-30, *ORNL Program for Lockout/Tagout (LO/TO) of Hazardous Energy Sources*. This procedure has been issued and is maintained with the LO/TO log in the Control Room.

One significant discrepancy was identified during a review of the program and work performed under the LO/TO procedure.

- During the performance of CERS/MSRE-014, *Process Valves SV-06 and SV-35* and CDRS/MSRE-015, *Repair Process Valves SV-4, SV-12 and SV-13*, the LO/TO

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requirement on the work package cover sheet was marked NA. Replacement/repair of these valves required breaking into systems that had either pressurized air or the potential for flow of contaminated fluids. This was contrary to the requirements of ORNL-SH-P30.

- Chapter 10 Independent Verification

This element was implemented through the Conversion COO Manual.

Based on a review of procedures currently in use, there were no independent verification requirements identified for this project.

- Chapter 11 - Logkeeping

This element was implemented through the Conversion COO Manual.

In general, logkeeping followed the requirements of the Conversion COO Manual. However, not all requirements of DOE Order 5480.19 are addressed. The order requires that the operations supervisor provide written guidance to define thoroughly the type and scope of entries for each log and the format for making entries. This is best accomplished by providing an instruction sheet in the front of the logbook.

The order also requires that a log be established for all key positions. Maintaining a single logbook for this project is sufficient; however, additional information is necessary to fully document the shift. The following additional information should be included:

- A sign-in statement including all key shift position titles and each individual's signature. (rubber stamps could be used for the titles since standard staffing is used for each procedure being performed)
 - A sign-out and sign-in statement for any position that conducts a turnover during the shift (this applies to any turnover, such as lunch, breaks, work stoppages).
 - An end of shift sign-out for all key positions.
- Chapter 12 - Operations Turnover

This element was implemented through the Conversion COO Manual.

DOE Order 5480.19 requires a formal shift turnover including completion of turnover checklist. Since this project does not operate on multiple shifts, this has not been addressed. To ensure all required information is provided to the oncoming supervisor, the project should consider a pre-shift checklist. The checklist should include the same type of information that would be on a turnover checklist. The checklist would be completed by the oncoming supervisor to ensure he has the most up to date project information prior to assuming his duties.

During the depressurization activity, the DAQ operator needed to leave the control room to attend a meeting. A formal turnover was not conducted and no log entry was made.

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Even though all shift personnel are located in the control room and likely understand the status of each position, it is imperative that formal turnovers are conducted at all times to ensure a consistent process occurs and that no detail is overlooked.

- Chapter 13 - Operations Aspects of Facility Chemistry and Unique Processes

This element was implemented through the Conversion COO Manual, Conversion of UF₆ Chemisorbed on NaF procedure and Depressurization of Building 3019 NaF Traps procedure.

This element was adequately implemented through the operating procedures.

- Chapter 14 - Required Reading

This element was implemented through the Conversion COO Manual and Conversion Required Reading program.

The Conversion COO Manual required that the Training Manager develop a required reading program that is managed electronically. An electronic system for posting and tracking required reading is in place; however, there is no program document or procedure that identifies the requirements for those personnel that must participate.

- Chapter 15 - Timely Orders to Operating Personnel

This element was implemented through MSRE/CP/001-ADM.

The standing orders/instructions procedure required that all operations personnel read any new orders prior to the shift. Since the project has a small staff and all are available in the control room at the start of shift, the existing process is adequate for implementation of this element.

- Chapter 16 - Operations Procedures

This element was implemented through the Conversion COO Manual.

The procedures for moving the carrier, depressurizing the NaF traps, and removal of items from the cell were in general adequate for performance of the activities. During the observation of the evolutions, two problems were identified with the procedures.

The first occurred when the procedure required starting the recirculation pump and verifying that it was running. Based on indications the pump did not start, the Conversion Operations Supervisor ordered the pump stopped and declared a hold on the procedure. The Conversion Operations Supervisor and the Conversion Operations Manager discussed the problem and correctly came to the conclusion that the pump was not necessary for the depressurization process. However, they decided to continue with the operations even though the step in the procedure gave no allowance for that action. The team after completing the day's activities decided, correctly, that they should have made a change to the procedure prior to proceeding. The procedure is being changed.

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Second, while conducting the pre-job briefing for removing smears from the cell and loading the NaF trap back into the carrier, the operations team determined that the proper steps were not in place to allow them to move from one procedure to the other. The Conversion Operations Supervisor correctly stopped work and notified the Conversion Operations Manager of the problem. They determined that a change to the procedure was necessary prior to continuing the procedure. The change process was initiated.

Some minor problems were identified by the assessment team that did not prevent the performance of the procedures. Recommended changes have been included in Core Requirement 10.

- Chapter 17 - Operator Aid Postings

This element was implemented through the Conversion COO Manual, Conversion of UF₆ Chemisorbed on NaF, Depressurization of Building 3019 NaF Traps, and Conversion Transportation Plans.

A review of the Operator Aid Postings Log showed that the process is adequately implemented. The chapter from the Conversion COO Manual is included in the front of the log for direction. Each operator aid was properly logged in and the posting met the requirements of the manual.

- Chapter 18 - Equipment and Pipe Labeling

This element was implemented under ORNL SBMS through the System Engineering program.

Labeling is provided on all equipment associated with the project; however, the labels only include the number of the valve/switch/component. The labels should also include the noun nomenclature for the valve/switch/component.

2. Evolution – Prerequisite Steps for Depressurization of NaF Traps

The pre-job briefing covered all required items with one exception. All precautions and limitations are to be covered during the briefing. The current procedure is not approved for fissile operation as indicated on the coversheet. This should have been discussed.

The prerequisite steps were completed using the reader/worker method. The operations team performed the procedure in a formal and disciplined manner. They also exhibited an exceptional knowledge of the procedure and what should be expected with each step. Some minor issues were identified with the procedure and are documented in CR-10.

3. Evolution – Movement of NaF Trap Carrier from Loading Dock Area to High Bay Area

- During the pre-evolution briefing three people left the briefing to respond to problems. The supervisor did not stop the briefing. He did finish the briefing with two of the people prior to

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starting the evolution; however he had to be prompted by the assessor to brief the third person.

- All work assignments were not made during the pre-evolution briefing as required, resulting in delays in the start of trap movement activities.
 - There is a requirement in the procedure to verify Cell D differential pressure prior to lifting the 6-inch plug. No one was assigned to perform this function during the pre-evolution briefing. All personnel had entered the Radiation Buffer Area (RBA) when this occurred, resulting in a delay while an operator frisked out to go verify the reading. Additionally, since a known alarm would occur due to the pressure drop caused by removing the plug, the operator was told to cut out the alarm. Although this was discussed during the pre-evolution briefing, the key was not taken from the control room and given to the operator as a pre-staging activity.
 - Coordination was not discussed so everyone would understand limitations on the operations due to the use of one radiological controls technician for support. This resulted in a potential cross-contamination by one operator.
- Procedure MSRE/CP/014-OPS did not identify the need for leather gloves as PPE when moving the cart or during rigging operations even though a significant pinching hazard exists. One operator decided to wear gloves on his own.
- The operations supervisor said, during the pre-evolution briefing, that he had verified that the procedure being used was the current version. When asked how he documented the verification, he did not know a requirement existed. MSRE/CP/001-ADM, *Development, Review, and Control of Procedures and Documents* required the verification be performed prior to use and a Document Verification sheet to be signed, dated, and attached to the procedure.

4. Evolution – Transferring Trap in Overpack from Carrier to HBA

The pre-job briefing covered all required items with one exception. All precautions and limitations are to be covered during the briefing. The current procedure is not approved for fissile operation as indicated on the coversheet. This should have been discussed.

The procedure was performed using the reader/worker method in a formal and disciplined manner. As before the team exhibited an exceptional understanding of the procedure and the systems being used.

5. Evolution – Hookup and Depressurization of NaF Trap

The pre-job briefing covered all required items with one exception. All precautions and limitations are to be covered during the briefing. The current procedure is not approved for fissile operation as indicated on the coversheet. This should have been discussed.

The procedure was performed using the reader/worker method in a formal and disciplined manner. As before the team exhibited an exceptional understanding of the procedure and the systems

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being used.

6. The Plan of the Day (POD) has been established to schedule activities and resources on a daily basis. The following is an evaluation of the process:
 - The intent of the process has been captured and the POD for this project goes further than many in the DOE complex by capturing not only operational activities but also administrative activities, such as procedure development and review. This an excellent practice to help ensure the best use of limited resources.
 - The POD should be signed and dated by the CP Operations Manager for approval of the day's work.
 - Work control document numbers were not included in the proper column.
 - The USQD column is a yes/no column and should be filled in for each item.
 - A column should be added to indicate if a pre-evolution briefing is required and the time and location of the briefing.
 - A column should be added to indicate when an RWP is required and the corresponding RWP number.
 - Providing a start time for activities using multiple resources would allow for better scheduling of those resources.

7. Maintenance

A review of the following Work Control Packages was conducted:

- WP-U233-MSRE-050, *Replace Hot Cell D Inlet HEPA Filter*
- CERS/MSRE-017, *Semi-annual Test Hot Cell D HEPA Filters Facility Ventilation*
- CERS/MSRE-014, *Process Valves SV-06 & SV-35 Replace Actuator*
- CERS/MSRE-015, *Repair Process Valves SV-4, SV-12 & SV-13*
- CERS/MSRE-016, *Replace Flexible Piping With Hard Piping*
- CERS/MSRE-003, *Move System to Cell*

The following issues were identified:

- None of the work packages reviewed implemented all identified JHE controls within the work instructions as required by ISMS. The packages provided limited work instructions, no prerequisites, and no precautions and limitations.
- Work packages containing verification steps and torque requirements did not include signatures for the steps or documentation of torque wrench information.
- CERS/MSRE-003 work instructions were written in narrative rather than action steps and even included text in the form of questions and suggestions.

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- WP-U233-MSRE-050 has been identified as a routine work package. The package is being maintained open and is issued under the same number whenever the HEPA filter needs to be replaced. Since a new MJO was not issued for each maintenance activity no documentation exists to prove start of work, completion of work, or package closure for each job. The work package should be controlled using a routine number to maintain approval but should be issued with a new MJO and cover sheet each time it is needed.
- Based on work package documentation the LO/TO procedure was violated on at least two occasions. Further discussion of this matter is included in the discussion of COO Chapter 9 implementation above.

Conclusion:

Although field operations showed a high level of understanding and commitment to the formality and discipline associated with Conduct of Operations, significant issues were noted with regards to programmatic implementation. Some issues are identified in this CR while others were addressed in other areas of the report. Although the Conversion COO Manual has been issued, the identified issues are indicative of an incomplete Conduct of Operations program. Therefore the CR and the POA prerequisite have not been met.

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Inspected by: <u> /signature on file/ </u> P. B. Clark	Approved by: <u> /signature on file/ </u> G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Management (MG)	Core Requirement Number: CR-14	Date: October 23, 2002
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Method of Appraisal:

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Project Director, Uranium 233 Conversion Project
- Project Deputy Director, Uranium-233 Conversion Project
- Readiness Manager, Uranium-233 Conversion Project
- Quality Assurance Coordinator, Uranium-233 Conversion Project

Records & Other Documents Reviewed:

- *Authorization Agreement for the Building 4501 Conversion Project Between the U.S. Department of Energy Oak Ridge Operations Office and UT-Battelle*, 4501CP-AA, Revision 1, approved September 12, 2002
- *ORNL Work Smart Standards Set 11, Building 4501 Nuclear Hot Cell Facility*, Revision. 10, approved September 13, 2002
- *Change Log, WSS Set 11: Building 4501 Nuclear Hot Cell Facility*, downloaded from the ORNL SBMS web site October 14, 2002
- *Focused Safety Management Evaluation of the Oak Ridge National Laboratory*, DOE Office of Environment, Safety and Health Oversight, August 2001
- *Focused Evaluation of Work Planning and Control in Research & Development Organizations*, IO-2002-09, issued August 29, 2002
- *Conversion Project Facility Work Authorization*, MSRE/CP-003-ADM, Revision 2, effective June 20, 2002
- *Integrated Safety Management Plan, Chemical Technology Division*, March 2001
- *MSRE 4501 U233 Conversion Project Review of Issues Identified in Recent Operational Readiness Reviews and DOE Assessments for Lessons Learned*, undated, provided to MSA Team on October 21, 2002

Evolutions/operations witnessed:

None

Discussion:

Authorization Agreement. An authorization agreement (AA) for the conversion project has been developed and executed. The AA contains expected terms and conditions, as well as the signatures of the Laboratory Director and the Acting Manager of the DOE/ORO. The AA will become effective when DOE authorizes the initial startup of the Conversion Project. The AA does not establish division-specific roles and responsibilities; therefore no change to the AA is required as a result of the recent change in facility ownership.

Implementation of the AA requires compliance with the standards and requirements listed in the Terms and Conditions (T&Cs) section of the AA. For this MSA, the Project's compliance status with respect to key T&Cs was evaluated on a functional-area specific basis and is therefore reported under the appropriate functional area(s) of this report.

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Systematic Review of Facility's Conformance to AA. Core Requirement 14 mandates a systematic review of the facility's conformance to the AA. While the Project has implemented many of the AA T&Cs, a systematic, documented review has not been completed. In the course of this assessment, the MSA Team recommended the development and maintenance of functional-area-specific flow-down matrices to confirm and monitor the conformance status of the facility with respect to its AA.

Work Smart Standards. The Work Smart Standards (WSS) set for Building 4501 (WSS Set 11) was reviewed. It is current as posted (Revision 10), and is consistent with the Change Log for WSS Set 11. Where the MSA found specific, technical weaknesses in implementation of the standards, these weaknesses are discussed under the appropriate functional area(s) of this report. However, items of note from a broader management perspective are discussed below.

Pursuant to Change 6 of WSS Set 11, the 4501 nuclear facility (and therefore the Project) must comply with the requirements of a Maintenance Implementation Plan submitted to DOE on April 16, 2002. However, the Implementation Plan has not been approved by DOE and is not in practice within the Project. No compensatory measures or corrective actions were in place at the Project level.

Pursuant to Change 10 of WSS Set 11, the 4501 nuclear facility (and therefore the Project) must implement the systems engineering requirements of DOE O 420.1A, *Facility Safety*. The contractual arrangement between DOE and UT-B provides for submittal of an Implementation Plan by March 13, 2003. Therefore, compliance status with the systems engineering requirements of 420.1A was not evaluated during this MSA. However, it was noted that the 4501 facility has assigned interim systems engineers to each of its vital safety systems. Given that these assignments are subject to change as the newly-formed Non-reactor Nuclear Facility Division is staffed, Project Management was cautioned to remain mindful of the programmatic and schedule commitments made in the 420.1A Implementation Plan as it develops.

Focused Safety Management Evaluation. The referenced evaluation was performed by the DOE Office of Environment, Safety and Health Oversight (EH-2). Implementation of applicable recommendations and observations from this evaluation was identified in the Project POA as an ORR prerequisite. The MSA Team reviewed the evaluation, noted the safety concerns reported by EH-2, and looked for evidence or other indications that the Project has taken action to specifically address these or other results of the evaluation. The MSA Team found that the Project had performed a review of the EH-2 evaluation and developed an issue-by-issue response.

The five Contractor-related concerns noted by the EH-2 assessment team, and the Project's status at the time of the MSA, were:

- **ES&H roles and responsibilities for line management are not adequately defined and understood.** Project-specific documents, and interviews and observations conducted during this MSA, indicate that the Project's performance in this area is excellent. Line management responsibility for safety is well-established and practiced.
- **Work planning and control processes are not well-defined or documented.** The Project's Facility Work Authorization document was viewed by the MSA Team as an excellent tool for planning and conducting operational evolutions. However, significantly improved performance is needed in terms of work planning and control for maintenance activities.

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- **Numerous Division-level procedures are not adequately developed and/or used to support effective ISM implementation.** The ISM Plan for the Chemical Technology Division (predecessor to NSTD) was reviewed during the course of the MSA. Given that the Plan does not reflect the formation of NSTD, NNFD, and other significant programmatic changes, it is not an effective ISM implementing vehicle. However, a Laboratory initiative is underway to retire all Division-level ISM Plans once a Laboratory-level Integrated Management Program Description document is issued.

The Project has defined the JHE process as adequate for addressing this issue. However, there are many aspects of ISM beyond those covered by JHEs. Therefore, the MSA Team found that the Project was lacking in the development and use of explicit and comprehensive ISM implementation tools.

- **Configuration management is not being implemented as required.** The Project has developed a series of CM-related procedures. The program was found to be adequately implemented.
- **Feedback and improvement processes are not adequately defined or implemented to effect consistent, continuous improvement.** Based on interviews, Project management and staff were found to be fully committed to the principles of feedback and continuous improvement. Real-time feedback sessions were held during the pre- and post-job briefings. Noteworthy items were tracked to closure using the EDL. However, the frequency and documentation of safety meetings, management walk-about, and lessons learned dissemination was inconsistent. Additionally, project-specific performance measures – not related to cost or schedule – had not been developed.

Focused Evaluation of Work Planning and Control in R&D Organizations. The referenced evaluation was performed by the UT-B Office of Independent Oversight (OIO). Implementation of applicable recommendations and observations from the evaluation was identified in the Project POA as an ORR prerequisite. In the evaluation, an R&D work authorization and control process in use by R&D groups within the Laboratory (Research Safety Summaries or RSSs) was examined. The MSA Team confirmed that an RSS was completed for the Project. Additionally, the MSA Team reviewed the OIO evaluation, subjectively identified issues appropriate for action by the Project, and looked for evidence or other indications that the Project has taken action to address specifically these or other results of the evaluation. The MSA Team found that the Project had performed a review of the EH-2 evaluation and developed an issue-by-issue response to the OIO evaluation.

From the perspective of the MSA Team, the following key items from the evaluation warranted examination and action by the Project:

- **A well-defined work authorization and control process should be established and implemented.** The Project's Facility Work Authorization document is an excellent tool for meeting this objective. As noted above, however, improved performance is needed in terms of work planning and control for maintenance activities.
- **A well-defined process should be established and implemented to determine and document that Project and support personnel are appropriately knowledgeable,**

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experienced, and trained. While Project personnel have exhibited high levels of knowledge and are known to have extensive experience, the Project’s training program is insufficiently mature to state that this objective has been met.

- **Mechanisms to ensure that line management verifies safety performance during skill-of-the-craft evolutions should be in place.** The Project utilizes on-the-job training, job performance measures, and other forms of supervisory oversight and mentoring to evaluate operational and safety-related techniques during the performance of Project-specific procedures. Given that the training program was not fully implemented, the MSA Team could not conclude that this objective had been met.

Conclusion:

An authorization agreement has been developed and executed for the Project. However, a systematic review of the facility’s conformance to the AA has not been adequately performed and documented. Additionally, the MSA identified weaknesses in the implementation status of the Work Smart Standards set for the Project. The MSA found that the Project had not taken adequate action to address the EH-2 and OIO evaluations. Therefore, neither CR-14, nor its associated prerequisites, was satisfied at the time of the MSA.

Inspected by: <u> /signature on file/ </u> L. R. Bauer	Approved by: <u> /signature on file/ </u> G. A. Harvey
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MSA ASSESSMENT FORM

Functional Area: Management (MG)	Core Requirement Number: CR-15	Date: October 22, 2002
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Method of Appraisal (short narrative description):

Reviewed documents, conducted interviews, and walked down the facility as indicated below.

Personnel Contacted/Position:

- Project Director, MSRE Uranium-233 Conversion Project
- Deputy Project Director, MSRE Uranium-233 Conversion Project
- Facility Manager, MSRE Uranium-233 Conversion Project and Building 4501
- Operations and Technical Manager, MSRE Uranium-233 Conversion Project
- Readiness Manager, MSRE Uranium-233 Conversion Project
- Quality Assurance Coordinator, MSRE Uranium-233 Conversion Project

Records & Other Documents Reviewed:

- *MSRE ²³³U Conversion Project Building 4501 Quality Assurance Program Plan, MSRE/CP/021-ADM, Revision 3, effective October 15, 2002.*
- *ATS Printout for Action No. 2.9, Flammable Storage Cabinet Full of Unknown and Old Chemicals, FINDING 4501-2002-03-01, downloaded October 16, 2002.*
- *ATS Printout for Action No. 2.27.2, Perform New Work Consistently in the ORNL Non-reactor Nuclear Facilities, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 276.1, All Fire Doors Separating Buildings 4501 and 4505 Will Be Tested and Inspected, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 276.2, A Formal Combustible Control Program for Building 4501 Will Be Prepared and Issued, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 276.3, Fire Alarm Lacks Appropriate Circuit Monitoring, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 276.4, HVAC Ducts Crossing Egress Paths Deviate from the 6'8" Minimum Headroom, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 983.1, Near Miss Occurrence Filed Due to Fall from Ladder, ORO-ORNL-X10NUCLEAR-2000-0024, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 1100, Near Miss with Cart Handle, ORO-ORNL-X10NUCLEAR-2001-0031, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 1119, Near Miss from Small Part Dropping from Overhead Crane, ORO-ORNL-X10NUCLEAR-2001-0036, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 1146, Discovery of Undesired Material Used in Bellows Valves, ORO-ORNL-X10NUCLEAR-2002-0007, downloaded October 16, 2002.*
- *ATS Printout for Condition No. 1158, Equipment Damage from In-Cell Operation, ORO-ORNL-X10NUCLEAR-2002-0011, downloaded October 16, 2002.*
- *ATS Printout for Action No. 3181.1, Numerous Log keeping Deficiencies, Concern 4501-2002-03-01, downloaded October 16, 2002.*

Evolutions/operations witnessed:

None

Discussion:

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Implementation of the Project QAPP. The Project QAPP addresses the criteria established by 10 CFR 830, Subpart A, as present in the ORNL QAP Program Description. As described below, one area potentially under-represented in the Project QAPP was in the area of calibrations.

Implementing tools for the Project's QA Program, as evidenced by Attachment 2 to the Project QAPP, are generally in place. The only required element for which a Project- or Division-specific implementing tool was not found was with respect to a Calibration Plan. While it is not necessary to have a Project-specific Calibration Plan, a reference to a Division- or Laboratory-Level Calibration Program Description is appropriate to address 10 CFR 830 Criteria 5 and 8.

The effectiveness of the implementing tools listed in the QAPP was evaluated on a functional area-specific basis and is therefore reported elsewhere in this report. However, one area of concern appropriately discussed in this section was with respect to controlled documents. The Project QAPP calls for numerous documents and records to be controlled, i.e., on controlled distribution. However, given the use of the Project's web site for document retrieval, compliance with this requirement was questioned. Controlled documents are available via the Project's web site and do not contain an intended document distribution list. It was further noted that controlled documents posted on the Project's web site are not always complete in terms of approval status. The Project's in-force ALARA Plan, for example, contains a blank signature page.

Issues Management. Assessment Tracking System (ATS) entries relating to the Conversion Project were reviewed to ensure deficiencies and corrective actions were tracked to closure. The review found for the most part that the Project has a good record of timely and effective corrective actions. There were numerous examples of prompt and proactive responses. It was further noted that worker participation and feedback were readily apparent in the critique and corrective action phases. There were cases, however, where more timely closure, and/or emphasis on generic implications, would have been appropriate.

Specifically, the ATS report for Condition 2.27.2 indicated an October 1, 2002, closure date. However, the targeted action, issuance of the NNFD Work Control Procedure, NNFD-004, was not complete at the time of this MSA.

Secondly, the closure date for ATS report for Condition 276.1, Fire Door Inspection and Testing, has been changed from August 31, 2001, to December 31, 2002. These date changes were deemed acceptable as the intent remained to complete the actions before conversion activities began. However, the safety significance of the issue warranted a less protracted schedule for completion. In the course of reviewing this issue, a concern with the closure of a related condition (276.4, Headroom Egress) was identified. Condition 276.4 was closed based on field verification that two of the three required markings were in place. The closure documentation would have been more robust had all three locations been checked.

A relevant example in terms of generic implications was the finding by the DOE Facility Representative of unknown chemicals in an unlocked flammable storage cabinet on the loading dock. The selected corrective actions addressed the loading dock cabinet, but did not expand into the building itself for similar storage concerns.

Conclusion:

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Functional Area: Management (MG)	Core Requirement Number: CR-15	Date: October 22, 2002
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A properly functioning action tracking program has been established and implemented for the Project. CR 15 has been satisfied. The Project's Quality Assurance Program Plan had been adequately implemented. Therefore, PR 15-1 has been satisfied. However, at the time of the MSA, pre-start actions were pending in ATS and therefore PR 15-2 was not satisfied.

Inspected by: <u> /signature on file/ </u> L. R. Bauer	Approved by: <u> /signature on file/ </u> G. A. Harvey
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Appendix B
MSA DEFICIENCY FORMS (Form 2)

MSA DEFICIENCY FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-10	Date: October 23, 2002 ID #: OP-01
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Requirement:

Ensures procedures, Standing Instructions, or other controlled documents are current versions prior to performing work.

Reference(s) (specific as to section):

MSRE/CP/001-ADM, *Development, Review, and Control of Procedures and Documents*, Revision 2, Section 7.9

MSRE/CO/001-ADM, *Development, Review, and Control of Procedures and Documents*, Revision 2, Section 5.1

Finding: X

Observation: _____

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Discussion:

There was no evidence that the controlled drawing being used to maintain status during performance of operations procedures was verified to be the most current version as required by MSRE/CP/001-ADM.

Conversion Project personnel did not follow the MSRE/CP/001-ADM procedure to verify that the documents being used were controlled copies. The procedure defines controlled copies as either a signed and dated verified copy (from the web) or a document that has been assigned a controlled copy number. Conversion personnel verified documents were the current versions via checking the Procedure Modification log.

Finding Designation: Prestart: X _____ Poststart: ___	Inspector: _____ /signature on file/ P. B. Clark
_____	Approved by: _____ /signature on file/ Date: _____

MSA DEFICIENCY FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-10	Date: October 23, 2002 ID #: OP-02
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Requirement:

NCS requirements of Table 1 shall apply to uses of liquids and liquid containers within Cell D at any time while the Cell D inventory exceeds 250 g U.

Provided the Cell D inventory does not exceed 250 g U, COA D.2.c is not applicable.

NCS-reviewed operating procedures shall specify a means of tracking (or providing an upper-bounding estimate) of uranium holdup within the Cell D process equipment and a means to assure that the uranium holdup limit for 4501 CP process equipment is not exceeded.

Reference(s) (specific as to section):

NCSA-85, D.2.b, D.2.c NOTE 2, E.1.d

Finding: X

Observation: _____

Discussion:

The operating procedures implement the above requirements while processing the NaF Traps. The radiation survey is part of the Preparation for Operations and can be performed either before or after a NaF Trap is entered into the hot cell. But there is no requirement or step for performing a final radiation survey, after the last trap is depressurized. The final survey is necessary to determine if the uranium holdup limit was exceeded due to the processing of the final trap.

Finding Designation: Prestart: X _____ Poststart: ___	Inspector: <u> /signature on file/ </u> J. G. Ezold
_____	Approved by: <u> /signature on file/ </u> _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-13	Date: October 23, 2002 ID #: OP-03
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Requirement:

The JHE is performed as part of planning for the work activity, and identifies controls that can be incorporated into the steps of the work activity under review.

Task Leader determines the need for a JHE to be performed by completing the prescreen exercise in Block B of Attachment A.

Incorporate Attachments A and B and any specific permits into the work package, work instruction, procedure, or PSS for the work activity under review.

Reference(s) (specific as to section):

MSRE/CP/025-ADM, *Job Hazard Evaluation*, Revision 1, Section 7.0
MSRE/CP/025-ADM, *Job Hazard Evaluation*, Revision 1, Section 6.1
MSRE/CP/025-ADM, *Job Hazard Evaluation*, Revision 1, Section 8.10

Finding: X

Observation: _____

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Discussion:

1. A JHE was prepared for work package CERS/MSRE-008, *Correction of Test Deficiencies*. The work package remained open to address test deficiencies as they were identified. There was no indication that the JHE was revisited as additional work requirements were added to the package. Although the JHE was broad in its scope and likely covered all hazards that might be encountered, it was not specific enough to cover each individual task in a way that would ensure incorporation of the proper hazard controls into work steps as required by MSRE/CP/025-ADM.
2. Copies of the JHE prepared for CERS/MSRE-008 were inserted in work packages CERS/MRSE-014, *Process Valves SV-06 & SV-35 Replace Actuators* and CERS/MSRE-015, *Repair Process Valves SV-4, SV-12 & SV-13*. As a minimum MSRE/CP/025-ADM requires the completion of a Block B prescreen for new activities. There is no documentation that prescreens were performed.

MSA DEFICIENCY FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-13	Date: October 23, 2002 ID #: OP-03
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3. Eight work packages were reviewed during the assessment. Of the eight packages reviewed, seven did not incorporate any of the JHE controls into the work instructions as required by MSRE/CP/025-ADM. The remaining package incorporated some but not all the controls identified in the associated JHE.

Finding Designation: Prestart : X Poststart: _____	Inspector: _____ /signature on file/ P. B. Clark
_____	Approved by: /signature on file/ _____ _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-13	Date: October 23, 2002 ID #: OP-04
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Requirement:

This procedure, permit forms, locks, and tags are to be used only for lockout/tagout of hazardous energy sources to ensure the safety of workers when performing service or maintenance on equipment or systems.

Reference(s) (specific as to section):

ORNL-SH-P30, *ORNL Program for Lockout/Tagout of Hazardous Energy Sources*, Revision 2, Section 3.A

ORNL-SH-P30, *ORNL Program for Lockout/Tagout of Hazardous Energy Sources*, Revision 2, Section 3.B.(1)

Finding: X

Observation: _____

Discussion:

Work packages CERS/MSRE-003, *Move System to Cell*, CERS/MSRE-014, *Process Valves SV-06 & SV-35 Replace Actuators*, CERS/MSRE-015, *Repair Process Valves SV-4, SV-12 & SV-13*, and CERS/MSRE-016, *Replace Flexible Piping with Hard Piping* documented the performance of work on components that had the potential for personnel exposure to pressurized air, potentially contaminated fluids or electrical energy. Neither the work packages nor the LO/TO log contained documentation to indicate LO/TOs were issued for this work. Additionally, the Work Authorization Forms contained in the packages were marked NA for LO/TO.

Finding Designation: Prestart: X Poststart: _____	Inspector: _____ /signature on file/ P. B. Clark
_____	Approved by: _____ /signature on file/ _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Operations (OP)	Core Requirement Number: CR-13	Date: October 23, 2002 ID #: OP-05
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Requirement:

Labels contain the following minimum information:

Noun Nomenclature:

A descriptive noun name will be assigned. For example, "7930 E1 Exhaust Fan," "Pressure relief isolation valve," etc.

Reference(s) (specific as to section):

SBMS - Management System: Nuclear and Facility Safety, Subject Area: System Engineering, Procedure: Maintaining Configuration Documents, Exhibit: Labeling Systems and Components

Finding: X

Observation: _____

Discussion:

Based on the applicability matrix included in MSRE/CP/004-ADM, *Building 4501 Conversion Project Conduct of Operations Manual*, Chapter 18, Equipment and Piping Labeling is implemented through SBMS – System Engineering. Based on observation the majority of labels affixed to components associated with the Conversion Project did not include the noun nomenclature as required under the System Engineering program.

Finding Designation: Prestart : X Poststart: _____	Inspector: _____ P. B. Clark
_____	Approved by: _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 23, 2002 ID #: TQ-01
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Requirement:

Prepare and submit a Training Implementation Matrix to the Operations Office Manager for review and approval.

Reference(s) (specific as to section):

DOE Order 5480.20A, Contractor Requirements Document, Requirement 2

Finding: X

Observation: _____

Discussion:

As required by DOE Order 5480.20A, the training implementation matrix (TIM) that defines and describes the application of the requirements of the Order has not been submitted to the Department of Energy for review and approval. As indicated by noted observations, some revision to the TIM is needed prior to submittal. Because the TIM primarily references the Training and Qualification program Plan (TQPP) as an implementing document for the requirements of the Order, a revision of the TQPP to address identified discrepancies and deficiencies is also needed. A TQPP revision may be approved prior to TIM submittal, or the TIM may indicate the “compliance date” within the project schedule when a revision of the TQPP will be approved.

Finding Designation: Prestart: <u> X </u> Poststart: _____	Inspector: _____ <div style="text-align: center;">/signature on file/ D. A. White</div>
	Approved by: _____ <div style="text-align: center;">/signature on file/</div> Date: _____

MSA DEFICIENCY FORM

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 23, 2002 ID #: TQ-02
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Requirement:

Operating organizations shall define qualification requirements for personnel in each functional level based on the criteria contained in this Order (DOE Order 5480.20A).

Reference(s) (specific as to section):

DOE Order 5480.20A, I.5.a.

Finding: X

Observation: _____

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Discussion:

DOE Order 5480.20A states that “operating organizations shall define qualification requirements for personnel in each functional level based on the criteria contained in this Order.”

Although elements of a substantial operations training program are in place, standards for qualification and certification of operators and supervisors have not been established and approved by the Project Director as required by the Training and Qualification Program Plan.

Qualification/certification cards have been developed for project operations personnel, but have not been approved for use.

Prior to the assessment, qualification process requirements had not been established for project personnel other than those directly involved in operations. Weaknesses were particularly identified for positions categorized as “managers” and “technical staff” by DOE Order 5480.20A. The positions that require qualification based on the Order must be clearly identified and requirements for person in those positions must be defined. Qualification, then, is a matter of demonstrating that the persons in these positions fulfill the defined requirements. Although qualification of managers and technical staff may be established by virtue of meeting entry-level requirements and by completing applicable positions-specific training (no comprehensive examination need be administered to determine their qualification), the basis for qualification must be established.

Finding Designation: Prestart: X ___ Poststart: _____	Inspector : /signature on file/ <div style="text-align: center; border-top: 1px solid black; width: 100%;">D. A. White</div>
	Approved by: /signature on file/ _____ _____ Date:

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 23, 2002 ID #: TQ-03
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Requirement:

Qualification may be granted only after assuring that all requirements (including training and examinations as required) and other specified requirements (e.g., medical examination) have been satisfactorily completed.

Certification may be granted only after all qualification requirements (including written and oral examinations and operational evaluations) and other specified requirements (e.g., medical examination) have been satisfactorily completed, and management has assured that the person is capable of safely performing all functions of the position. Satisfactory completion of qualifications which results in certification shall be verified by a person or group other than the candidate's immediate supervisor or the person/group that provided the training.

Reference(s) (specific as to section):

DOE Order 5480.20A, I.5.e.
DOE Order 5480.20A, I.6.b.

Finding: X

Observation: _____

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Discussion:

The Training Coordinator produced a qualification card format with a common generic position title that was being tailored to each person involved in hands-on operations and supervision. With a suggestion from the assessment team member that the qualification cards should be related to each position requiring qualification, three separate qualification cards for the operations level positions were developed the same day for the hot cell operator, the manipulator operators, and the operations supervisors. Use of these qualification cards had not been approved yet, and they had not been implemented as tools to determine status of persons in fulfillment of the listed requirements.

The Training Coordinator also produced letters, dated October 14, 2002, from the Project Director to the Training Manager establishing “subject matter expertise” of the operators and supervisors. The letters regarding the operators stated that each was “qualified to operate the depressurization process equipment, provide direction to trainees, and perform classroom and on-the-job training after completion of appropriate Instructor Training.” The letters prepared for supervisors stated that they additionally were “qualified to supervise all phases of the depressurization process” and “process personnel.” The letter noted that each person was “eligible to sit for the certification exam.”

MSA DEFICIENCY FORM

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 23, 2002 ID #: TQ-03
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The Training Coordinator stated that all requirements for qualification of operators and supervisors have been satisfied (with the exception of training on the unapproved NCSAs) and each person is awaiting written and oral board examinations. Those persons involved in "hands-on operation," i.e., Conversion Project (CP) Hot Cell Operations and CP Operations Supervisors as identified in the September 10, 2002, organization chart, require certification in accordance with requirements of DOE O 5480.20A requirements for fissile material handlers and supervisors of fissile material handlers.

Assuming that the qualification cards define the requirements that will be approved as standards (See TQ-03-02), completion of all requirements for each person requiring qualification and/or certification has not been verified. This assessment has indicated that some elements of qualification (in addition to NCSA training) are incomplete.

Finding Designation: Prestart: X____ Poststart: _____	Inspector: _____ /signature on file/ D. A. White
_____	Approved by: _____ /signature on file/ _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 22, 2002 ID #: TQ-04
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Requirement:

Written and oral examinations and operations evaluations shall be administered to certified operations and supervisors.

The program leading to certification shall be governed by written procedures that include requirements for documented assessment of the person's qualification through examinations and operational evaluations.

Written examinations shall be administered to certified operation candidates (fissionable material handlers and other positions that have been designated as certified...

Written examinations shall be administered to certified supervisor candidates.

Reference(s) (specific as to section):

- DOE Order 5480.20A, I.5.d
- DOE Order 5480.20A, I.6.a
- DOE Order 5480.20A, IV.4.d
- DOE Order 5480.20A, IV.4.e

Finding: X

Observation: _____

Discussion:

As self-identified by the Project Team prior to the MSA, requirements of DOE Order 5480.20A for certification of fissile material handlers and supervisors of fissile material handlers have not been completed by the project operators and supervisors. Neither have test questions and examinations been developed to support certification and address the "representative sampling of items" listed in the Order for written examinations. The DOE Order 5480.20A Training Implementation Matrix prepared for the project indicated planned compliance with this requirement by December 1, 2002.

Finding Designation: Prestart: X _____ Poststart: __	Inspector: _____ /signature on file/ D. A. White
	Approved by: _____ /signature on file/ Date: _____

MSA DEFICIENCY FORM

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 22, 2002 ID #: TQ-06
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Requirement:

For persons requiring long-term access (i.e., more than 1-2 weeks), understanding of the information provided by the GET program shall be evaluated by administering a written examination.

Changes in GET areas ... shall be included in continuing training programs for all facility personnel.

Reference(s) (specific as to section):

DOE Order 5480.20A, I.7.e.(3) and (4)

Finding:

—

Observation: X _____

Discussion:

The content requirements of DOE O 5480.20A (I.7.e) for “General Employee Training” appear to be met by the combined content of ORNL General Employee Training Program and the access orientation/training for the hot cell and high bay areas of the facility. The Order, however, requires evaluation of understanding by “administering a written examination.” The facility access orientation/training did not require a test for successful completion. An unlimited validity period for the qualification imparted by the hot cell and high bay access orientation/training does not indicate that “changes to the General Employee Training” are “included in continuing training programs” as required by Chapter I.7.e.(4).

Finding Designation: Prestart: _____ Poststart: X _	Inspector: _____ /signature on file/ D. A. White
_____	Approved by: _____ /signature on file/ Date: _____

MSA DEFICIENCY FORM

Functional Area: Training & Qualification (TQ)	Core Requirement Number: CR-03	Date: October 23, 2002 ID #: TQ-07
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Requirement:

Technician and maintenance personnel qualification shall include demonstrated performance capabilities to ascertain their ability to adequately perform assigned tasks.

Reference(s) (specific as to section):

DOE Order 5480.20A, I.5.c.

Finding:

—

Observation: X

Discussion:

Memoranda of understanding (MOU) have been established to define responsibilities for the operating division and support organizations for qualification of support personnel. These agreements, referenced in the TIM table, were approved in May 2001 by the Chemical Technology Division and the following divisions:

- Operational Safety Services Division, for qualification Radiological Control Technicians
- Instrumentation and Controls Division, for qualification of controls and instrument technicians
- Facilities and Operations Directorate (approved by the manager of Craft Resources Division), for qualification of maintenance and crafts support personnel.

Since approval of the service agreements, organizational changes have occurred so that the current executing organizations and managers are not named in the agreements. Although the assessment team understands that the current organizations and managers are honoring these service agreements, the need to revise these documents as soon as practical is recognized. Since controls and instrument technicians are not a part of the Facilities and Operations Directorate, the agreements for qualification of controls and instrument technicians and craft support may be combined into one document.

Finding Designation: Prestart: _____ Poststart: X _	Inspector: _____ /signature on file/ D. A. White
_____	Approved by: _____ /signature on file/ _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Safety Documentation (SD)	Core Requirement Number: CR-09	Date: October 23, 2002 ID #: SD-02
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Requirement:

Appropriate personnel should be involved in the configuration management of the project.

Reference(s) (specific as to section):

Section IV.A(15) of ORNL-FS-P03, ORNL Configuration Management for Nuclear Facilities

Finding:

Observation: X

Discussion:

Discussion: By project procedures, the Conversion Project Configuration Manager is involved in the configuration management of structures, systems, and components (SSCs) in the initial work package approval. However, MSRE/CP/001-ADM does not involve him in an equivalent manner for the preparation or revision of project procedures and MSRE/CP/003-ADM does not involve him for the revision of work packages. In addition, MSRE/CP/003-ADM needs revision to correct the listing of configuration items in Appendix 8.5 (or just reference MSRE/CP/035-ADM) and to strengthen the wording for USQ screening in Appendix 8.7 and MSRE/CP/017-ADM needs revision to correct procurement reference information in Section 6.2.

Finding Designation: Prestart: _____ Poststart: X ___	Inspector: <u> /signature on file/ </u> <div style="text-align: center;">D. G. Renfro</div>
_____	Approved by: <u> /signature on file/ </u> _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Startup Test Program (STP)	Core Requirement Number: CR-12	Date: October 22, 2002 ID #: STP-01
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Requirement:

An adequate startup or start program has been developed that includes plans for graded operations and testing after startup or resumption to simultaneously confirm operability or equipment, the viability of procedures, and the performance and knowledge of the operators.

Reference(s) (specific as to section):

DOE O 425.1B, Section 4.d.(12)

Finding:

Observation: X _____

Discussion:

The Start-Up Plan was not clear in regards to its graded approach to normal operations or in the approval authority to release of first-use controls. Examples as follows:

1. The definition of evolution combined with the Post-Evolution Checklist did not allow the flexibility of releasing definitive tasks, as defined in the procedures.
2. Section 6 of the Plan identified no position responsible for the removal of first use controls.
3. Section 9 of the Plan states that the Operations Manager and the Facility Manager approve removal of the first-use controls, yet neither are required to participate in the evolution or the post-evolution review.
4. The Operations Supervisor is responsible for completing the Post-Evolution Review Checklist and therefore checks whether the evolution was acceptable.

Finding Designation: Prestart: Poststart: X ___	Inspector: _____ /signature on file/ J. G. Ezold
_____	Approved by: /signature on file/ _____ _____ Date:

MSA DEFICIENCY FORM

Functional Area: Management (MG)	Core Requirement Number: CR-1	Date: October 23, 2002 ID #: MG-01
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Requirement:

ISMS must be integrated into the management and execution of work at all levels. Activities must address all ISM core functions and guiding principles.

Reference(s) (specific as to section):

*Integrated Safety Management System (ISMS) Program Description, April 17, 2001, Sections 2.1, 5.3, and 5.4
DOE Policy P 450.4, Safety Management System Policy*

Finding: X

Observation: _____

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Discussion:

While the Project’s commitment to the principles of ISM was evident during the MSA, an explicit link from the Project to an ISM implementing tool has not been established. A Project-specific ISM Plan has not been developed, and the predecessor document to an NSTD-level Plan does not include the Project or Building 4501 activities. Additionally, the Project’s implementation of ISM, with respect to documenting Competence Commensurate with Responsibilities as well as providing Feedback and Continuous Improvement, requires improvement to meet expected standards of practice for ISM.

Finding Designation: Prestart : X Poststart: _____	Inspector: _____ /signature on file/ L. R. Bauer
_____	Approved by: /signature on file/ _____ _____ Date: _____

MSA DEFICIENCY FORM

Functional Area: Management (MG)	Core Requirement Number: CR-1	Date: October 23, 2002 ID #: MG-02
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Requirement:

Findings from the EH-2 and OIO Focused Evaluations have been addressed for the Project.

Reference(s) (specific as to section):

Operational Readiness Review Plan of Action for the Building 4501 Depressurization of Sodium Fluoride Traps Containing Uranium from the Molten Salt Reactor Experiment at Oak Ridge National Laboratory, Oak Ridge, Tennessee, Section 7.1

Finding:

Observation: X

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Discussion:

Project documentation indicated that EH-2 Finding ORNL-FSME-01-03 was adequately addressed via the Project's JHE process. While the Project's JHE process is an important component of ISM implementation, it is inadequate as the sole ISM implementation tool.

Project documentation indicated that EH-2 Finding ORNL-FSME-01-05 was adequately addressed via the Project's real-time feedback mechanisms (pre- and post-job briefs). While the mechanisms in use by the Project are effective and value-added, they represent a subset of ISM expectations for Feedback and Continuous Improvement.

To address fully the OIO Issue IO-2002-09, Work Control, it will be necessary for NNFD to implement its work control standard. Though NNFD-004, *Work Control*, was targeted for release on October 1, 2002, the document has not been issued.

Finding Designation: Prestart : Poststart: X _____	Inspector: _____ /signature on file/ L. R. Bauer
_____	Approved by: /signature on file/ _____ _____ Date:

MSA DEFICIENCY FORM

Functional Area: Management (MG)	Core Requirement Number: CR-14	Date: October 23, 2002 ID #: MG-03
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Requirement:

A systematic review of the Project's conformance to the requirements governing safe operation has been performed.

Reference(s) (specific as to section):

Operational Readiness Review Plan of Action for the Building 4501 Depressurization of Sodium Fluoride Traps Containing Uranium from the Molten Salt Reactor Experiment at Oak Ridge National Laboratory, Oak Ridge, Tennessee, Section 6.2.14

Finding: X

Observation: _____

Discussion:

A systematic review of the implementation status of the Terms and Conditions for the Project's AA, which includes by reference Work Smart Standards Sets 1 and 11, has not been performed. The Project would benefit greatly from flow-down matrices that document functional requirements and the associated implementation mechanism(s).

Finding Designation: Prestart: X _____ Poststart: ___	Inspector: _____ /signature on file/ L. R. Bauer
_____	Approved by: /signature on file/ _____ _____ Date:

Appendix C

MANAGEMENT SELF-ASSESSMENT (MSA) TEAM MEMBERS

MANAGEMENT SELF-ASSESSMENT (MSA) TEAM MEMBERS

Gerald Harvey	Team Leader
David Renfro Julie Ezold	Testing/Modifications/Configuration Management
Allen White	Training and Qualification
Linda Bauer	Management, Team Co-Leader
David Renfro	Safety Documentation
Paul Clark Julie Ezold	Operations
Lois Szluha	Administrative Support

Appendix D
PROCEDURE COMMENTS