Enclosure 3
Letter, Felton to Jackson
Dated: July 27, 1998

Y/MA-7373

Lockheed Martin Energy Systems, Inc. Operational Readiness Review Report for the Enriched Uranium Operations Restart Phase A1 at the Oak Ridge Y-12 Plant

April 1998

I, by signature here, acknowledge that I concur with the findings and conclusions of this report in my assigned functional area(s).

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DATE: 4/14/98

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EXECUTIVE SUMMARY

The Lockheed Martin Energy Systems, Inc. (LMES), operational readiness review (ORR) is one of the activities to be completed prior to restarting Enriched Uranium Operations (EUO) Phase A1 activities at the Department of Energy (DOE) Y-12 Plant. The results of the ORR will be used to determine whether the core objectives as described in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A* (the POA), have been adequately met.

Operations at the Y-12 Plant were shut down in September 1994 as a result of operational deficiencies noted by the Defense Nuclear Facilities Safety Board (DNFSB) staff during routine activities. LMES initiated a Type C Investigation to determine the full significance of the deficiencies observed. The investigation revealed that several improvements were necessary to resume operations in a disciplined manner. The resulting extended shutdown led to the completion of this ORR in accordance with DOE Order 425.1, *Startup and Restart of Nuclear Facilities*, and DOE Standard 3006-95, *Planning and Conduct of Operational Readiness Reviews (ORR).*

The ORR was conducted March 2-6, 1998, and April 3-10, 1998. The ORR was a systematic inquiry into the ability of the Y-12 Plant staff to conduct EUO Phase A1 activities in a safe and disciplined manner. The scope of the ORR was determined by the core objectives identified and approved in the POA. The ORR team identified 38 findings, 28 of which are considered significant enough to require closure prior to resumption of operations.

When taken together, the findings indicate a lack of management commitment to disciplined operations. Most notably, findings in the areas of Safety Documentation, Criticality Safety, Surveillance, Training and Qualification, and Management demonstrate this lack of commitment. The following are examples of problems noted:

1. Information was incorporated into criticality safety documents without documented technical justification.

2. Surveillances required by the authorization basis were not properly conducted.

3. Qualitative analyses, rather than quantitative analyses, were used to categorize some plant equipment as safety significant, rather than safety class.

4. Corrective actions were often closed while the associated problem remained unresolved.

5. Individuals who had not received necessary training were allowed to continue performing their normal duties.

Based upon the significant number of findings that have a direct impact on achieving, implementing, and maintaining a solid authorization basis, restart of EUO Phase A1 processes is not recommended until all prestart findings have been addressed and corrective actions verified by the ORR team.

I. INTRODUCTION

A. General

During a review of Building 9204-2E containerized storage operations and applicable Criticality Safety Approvals (CSA) on September 22, 1994, violations of administrative safety controls associated with material storage arrays were observed. Operations personnel, upon discovery of the criticality safety violation, did not immediately administratively control the area (i.e., ensuring that personnel were kept at a safe distance away from the array). They also did not immediately notify Nuclear Criticality Safety Department (NCSD) personnel or the plant shift superintendent. This was a violation of LMES and Y-12 Plant training and procedures. Following the event, all CSAs were walked down and seven categories of criticality safety nonconformances were identified with a total of 1,344 individual observations.

Examination of the data from the evaluation of the CSA walkdowns, the occurrence report covering the initial infraction, the Type C Investigation, and DNFSB Recommendation 94-4 indicated the basic cause was a lack of rigor in conduct of operations that permitted less than strict compliance with procedures. Within the umbrella of conduct of operations, the principal failure was personnel not following procedures with the rigor required. A contributing factor was the lack of training on CSAs in particular. CSAs were not always clearly written, and their limitations were not well understood by some personnel.

B. Y-12 Plant

The Y-12 Plant is managed by LMES for DOE. For four decades the Oak Ridge Y-12 Plant has been the national center for the handling, processing, storage, and disassembly of all DOE-controlled enriched uranium (EU) materials and components, as well as depleted uranium (DU) and other special materials components.

The DOE defense activities at the Y-12 Plant include the dismantling of nuclear weapons components returned from the national arsenal, serving as the nation's storehouse for special nuclear materials, maintaining nuclear weapons components production capability and stockpile support, and providing special production support for other DOE programs and customers. In addition, as the primary EU repository for the United States, the Y-12 Plant has the facilities and security systems for EU storage, chemical recovery, and material purification and fabrication.

Resumption activities for the Y-12 Plant are divided into mission areas that are defined by programmatic mission descriptions and needs. The ORR implementation plan (Appendix A) addresses the scope of the restart of Enriched Uranium Operations Phase A1 activities, which is one of the mission areas for the Y-12 Plant.

C. Enriched Uranium Operations Restart Phase A1 Activities

The EUO Organization primarily supports DOE defense programs. The facilities involved in this restart will support defense programs. The facilities will process enriched uranium from dismantled nuclear weapons into a form for long-term storage. These facilities also support nondefense programs by producing or recovering enriched uranium from unirradiated research reactor fuel, recovering enriched uranium from salvage materials to support accountability, and providing purified metal to nonweapons customers. Other missions are identified on an as-needed basis by DOE and other customers.

The metal working processes being restarted in Phase A1 are in E-wing of Building 9212 (casting), M-wing of Building 9215 (machining), and O-wing of Building 9215 (rolling and forming). The Phase A1 accountability processes are in the Building 9212 complex and the Building 9818 complex. These processes are supported by the radiography and density inspections performed in Building 9981 and dimensional inspections performed in Building 9998.

1. Building 9212 Operations Area

The enriched uranium casting operation employs vacuum-induction casting furnaces, metal shearing and breaking, light machining, and casting by-product handling. This operation is located in Building 9212 E-Wing.

The enriched uranium accountability operations are performed by bulk reduction, dissolution, and evaporation. Enriched uranium is placed in can and safe bottle arrays for in-process storage. These equipment and storage areas are located in the Headhouse and B-1, C-1, D-1, and E- Wings of Building 9212. Operation of the dissolution process is supported by the chemical makeup; organic treatment; and nitric acid and aluminum nitrate recycle operations in the Building 9818 complex located west of Building 9212.

Ancillary equipment (such as exhaust fans) is located in C-1 Wing, adjacent buildings, or on the roof of Building 9212.

Uranium oxides are produced from a uranyl nitrate solution using dissolution, precipitation, furnaces, and particle-sizing operations in Rooms 1021, 1022, and 1010 of Building 9212. Shipping and receiving are conducted in Room 1004.

Radiography and density inspections in support of EUO are performed in Building 9981.

2. Building 9215 Operations Area

The machining operations of enriched uranium are performed in M-Wing of Building 9215. These operations are performed on the numerically-controlled/manually-operated lathes, mills, borers, and grinders. Significant support equipment for these operations includes chuck vacuum and machining coolant systems. The enriched uranium chips generated by the machining operations are transported to E-Wing of Building 9212 for further processing or storage. This chip processing includes cleaning, drying, and briquetting of the chips prior to recasting.

Enriched uranium rolling and forming are performed in O-Wing of Building 9215. Equipment and operations necessary to produce a wrought part include molten salt baths, a rolling mill, water rinse systems, mechanical leveling and shearing, heat treatment ovens, hydroform, and several material conveyance devices.

Dimensional inspections in support of enriched uranium casting and forming operations are performed in Building 9998, which is connected to M-Wing of Building 9215.

D. Operational Readiness Review Process

The ORR was conducted to determine whether Enriched Uranium Operations personnel were ready to resume the Phase A1 activities that were shut down as a result of events on September 22, 1994.

An implementation plan (Appendix A) was prepared to comply with the requirements of DOE Order 425.1 and DOE-STD-3006-95. The scope of the ORR is described in the POA, Y/MA-7316, which was prepared by Y-12 Plant line management and approved by the DOE manager, Oak Ridge Operations.

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

Results of the ORR are provided in this report. Deficiencies are classified as prestart findings, which must be closed prior to resumption of operations, or poststart findings, which should have approved corrective action plans and milestones in place prior to resumption.

The ORR team consisted of four LMES employees, one Lockheed Martin Energy Research Corporation employee, one Lockheed Martin Idaho Technologies Company employee, and three technical consultants.

The ORR was begun on March 2, 1998, and suspended on March 6, 1998, due to EUO processes not being sufficiently prepared for the review. The ORR was begun again on April 3 and completed on April 10, 1998. This report documents the results of both portions of the ORR.

II. OPERATIONAL READINESS REVIEW RESULTS

A. OPERATIONS (OP)/PROCEDURES (PR)

The assessment in the operations and procedures area were performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. Incumbent personnel had adequate knowledge of Phase A1 processes and requirements to safely fulfill their duties.
2. There were adequate numbers of personnel to support safe operations and do initial production.
3. Applicable Conduct of Operations (COO) programmatic elements were in place.
4. Personnel had been trained in key COO principles.
5. Weaknesses in COO had been identified and corrective or compensatory actions were in place.
6. Phase A1 operating procedures and other technical and administrative procedures were consistent with descriptions in the safety documentation.
7. A process was in place to ensure procedure revisions were reviewed for consistency with the safety documentation.
8. Procedures were revised to reflect installed modifications.
9. Necessary operating procedures, including job performance aids (JPA), alarm response, abnormal, and emergency procedures were approved.
10. Operating procedures accurately incorporated the requirements identified in the safety documentation.

Approximately 18 evolutions were observed that required the use of over 20 procedures and a dozen JPAs. While observing these evolutions in the field, use of effective communications, proper labeling, use of operator aids, adherence to procedures, and familiarity with system status was evaluated. Six operator rounds were also observed.

Narrative logbooks, required reading notebooks, and timely orders notebooks were reviewed. In addition, at least seven programmatic procedures were reviewed, document management center (DMC) activities were observed, and a written examination was administered to five supervisors and five operators in four different qualification/certification areas.

Pre-job briefs were particularly noteworthy, as was the positive attitude and desire to succeed demonstrated by the operating personnel. Based on the records reviewed, personnel interviewed, and evolutions observed, applicable conduct of operations programmatic elements were in place, and the conduct of operations was adequate in most areas. However, the quality of rounds and the use of round sheets did not always ensure that facility status was known and understood (Finding A1-OP-01). Mentors were used as a compensatory measure when performing procedures involving fissile material activities, because the desired level of formality in conduct of operations had not been demonstrated. Procedures were followed in most cases. However, mentor intervention occurred in some instances to ensure the procedures were followed step by step.

A viable system existed for the control and issuance of procedures, JPAs, and Criticality Safety Requirements (CSR). The DMC contained the latest revision of procedures, JPAs, Operational Safety Requirements (OSR), and CSRs. Procedures, JPAs, and CSRs observed in use were approved and were the latest revision. Operations personnel understood the CSR and procedure revision process, including how to verify the latest approved revision of a CSR or procedure. Operating procedures and JPAs, including their associated safety documentation, were consistent with each other and incorporated the requirements identified in the safety documentation. However, conditions in the field did not match conditions required in one of five CSRs that were walked down (Finding A1-CS-04). In addition, 75 percent of the evolutions observed involved the use of procedures that were either inadequate, incorrect, or both inadequate and incorrect (Finding A1-PR-02). In one case, an operator following an approved procedure started a pump, and it ran for one and one-half hours without anyone realizing it.

Personnel in the field understood procedures, JPAs, OSRs, and CSRs. Training programs included training on the chapters in the *Nuclear Operations Conduct of Operations Manual*. Qualification/certification examinations adequately verified facility-specific level of knowledge. Although level of knowledge weaknesses existed in some areas, operations personnel had adequate knowledge of processes and requirements to fulfill their duties.

Based on the records reviewed, personnel interviewed, and evolutions observed, the numbers and qualifications of operating personnel necessary to perform the tasks specified in the operating procedures and JPAs were adequate for operations.

Key personnel involved in the configuration control process were interviewed and associated programmatic documents were reviewed. A process was in place to ensure installed modifications were reflected in procedure revisions, and procedure revisions were reviewed for consistency with safety documentation.

After the resolution of prestart findings, and with the continued use of mentors as a compensatory measure, adequate controls will be in place to resume EUO Phase A1 activities.

The deficiencies identified in the operations and procedures functional areas are as follows:

A1-OP-01	Finding	The quality of rounds and the use of round sheets does not always ensure that facility status is known and understood. (Prestart)
A1-PR-02	Finding	The procedure and job performance aid review process does not ensure that procedures are correct prior to their issuance. (Prestart)

B. SAFETY DOCUMENTATION (SD)

The safety documentation functional area was evaluated against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. Safety documentation was in place that described the safety envelope.

2. The safety documentation characterized hazards and risks and identified mitigating measures to protect worker and public safety from the characterized hazards.

3. Safety systems were defined in the facility safety documentation.

4. There were adequate and correct safety limits for operating systems.

The methodology employed to ensure that the assumptions credited in the Accident Analysis, Section 5, of the Building 9212 and Building 9215 Basis for Interim Operation (BIO) were transferred to Operational Controls in Table 6.1 was reviewed. These controls were established to assure the safety bases requirements were implemented in the facility. It was determined that not all of the assumptions were contained in Table 6.1, and an undocumented process was used to establish criteria for inclusion. Part of the review to determine which items required implementation, and thus inclusion in Table 6.1, was based on qualitative engineering judgement. The basis for this judgement was not documented in the BIOs or support files maintained by the Authorization Basis Team (Finding A1-SD-01). A second area of concern with Section 5, Accident Analysis, reviews for facility implementation centered on the administrative requirements of the Building 9212 and 9215 OSRs. Y-12 personnel established the requirement that all passive Criticality Safety Requirements (CSR) needed to be analyzed to determine if they were susceptible to degradation and, therefore, needed to be surveilled periodically. Not all of the passive requirements had been reviewed; none of the passive requirements had been forwarded to facility operations management to ensure the surveillances had been addressed; and the methodology for the analysis and determination was not documented (Finding A1-SD-04).

Sample calculations for worker, co-located worker, and the public were reviewed against assumptions associated with the accident analysis for Building 9215. Two of the calculations were not conservative with respect to the co-located worker dose expected from an unmitigated release. During discussions with the Authorization Basis Team, it was determined that an incorrect ventilation system assumption had been made (Finding A1-SD-02).

A review of the Buildings 9212 and 9215 BIOs identified a credible potential for structural damage to both facilities from natural phenomena based accidents. In the event of an evaluation basis earthquake, Building 9212 structural damage and failure of the E-Wing east wall would occur. This failure, coupled with the internal process and structural failures due to non-seismically qualified structures, systems, and components, would lead to unmonitored release paths capable of releases larger than those identified in the Accident Analysis section of the Building 9212 BIO. Building 9215, in the event of an evaluation bases high wind scenario, would be susceptible to roof damage. This roof damage had the same potential for excessive releases as described in Building 9212 for an earthquake. There was no documentation available that supported the acceptability of this risk for the period between BIO implementation and the writing and implementation of a new Safety Analysis Report (Finding A1-SD-03).

Section 5, Safety Analysis, of the Building 9212 BIO contained calculations associated with postulated fires. A review of these calculations was conducted to determine adequacy. In two cases, the unmitigated releases due to the fires exceeded the exposure guidelines for the general public established in ES/CSET-15/R1, *Safety Classification and Special Design Criteria Development Application Guide*, requiring the systems to be identified as Safety Class (SC). The BIO had downgraded the classification to Safety Significant (SS) without reperforming the calculations. The only documentation available to support these conclusions was a qualitative analysis stating that conservative assumptions were used in the initial calculations. In both cases, the calculations exceed the dose limit by greater than 1.5 times (Finding A1-SD-07).

An assessment was conducted to ensure that systems necessary to maintain the Building 9212 and Building 9215 safety envelope were adequately addressed in the BIO and implemented in the OSRs. In the two cases reviewed, this was found to be less than adequate. The BIOs required that all of the active features associated with the CSRs be included in the OSRs. The review of the casting operations CSR identified a series of check valves associated with the casting furnace cooling water system that were not included in the OSRs (Finding A1-SD-06). A second area of concern was associated with the Building 9212 Stack 38 and Building 9215 Stack 3 ventilation systems. The accident analyses credit HEPA filtration as the mitigator for release of material to the co-located worker and the public. The actual points of incident (fires) occurred at remote locations in the facilities and required design flows from that point through the ventilation system to the associated HEPA filters. No consideration was given to the ventilation system dampers, fans, and ductwork that were required to ensure the point of incident upset was adequately dealt with. There were no components and, therefore, no surveillances identified in the OSRs to ensure the safety envelope was maintained (Finding A1-SD-05).

A review was conducted of the Building 9212 and Building 9215 BIOs and OSRs regarding minimum shift complements. The BIO and OSR required a minimum of eight on-site emergency response personnel to be available 24 hours per day. The shift complement for the Y-12 Fire Department was eight emergency response personnel on shift for back shifts and weekends. Although the OSR requirement allowed the minimum number to be less than eight for up to 90 minutes in the event of a required medical emergency or mutual aid response, no notification of the Building 9212 and Building 9215 operations management was required when the emergency response personnel minimum was not met. Further, no corrective or mitigative guidance had been established for what actions the Building 9212 and Building 9215 operations management should take in the event the minimum shift complement was not met (Finding A1-SD-08).

The overall conclusion in the safety documentation functional area is that, although the current safety documentation has been approved and the current revision (March 1998) is in the process of being implemented, the structures, systems and components necessary to support safe operations of the facility are not adequately addressed. Based on the current status of the safety documentation, the criteria of this functional area cannot be met without the necessary corrections to address the prestart findings identified during this ORR.

The deficiencies identified in the safety documentation area are as follows:

A1-SD-01	Finding	Methodology for identifying the BIO accident analysis assumptions that need to be identified as "necessary control" in the Operational Controls Section (Section 6) is not documented. (Poststart)
A1-SD-02	Finding	Two referenced calculations in the Building 9212 BIO do not reflect the potential worst-case scenarios for the fires being analyzed. (Prestart)
A1-SD-03	Finding	No documentation addresses the acceptability of the risk associated with evaluation basis events due to natural phenomena accidents. (Prestart)
A1-SD-04	Finding	Passive CSR requirements have not been analyzed for degradation and included in the facility surveillance requirements when necessary. (Prestart)
A1-SD-05	Finding	Not all of the SC or SS ventilation systems, structures, and components are included in the Building 9212 or Building 9215 BIOs. (Prestart)
A1-SD-06	Finding	Not all the active design features in the CSRs have been translated into Limiting Conditions for Operations in the BIOs. (Prestart)

A1-SD-07	Finding	Two ventilation systems classified SC based on the calculations in the BIOs were classified SS without support recalculations. (Prestart)
A1-SD-08	Finding	Emergency response personnel minimum shift complement in support of Building 9212 and Building 9215 cannot be assured. (Prestart)

C. CRITICALITY SAFETY (CS)

The assessment in the criticality safety area was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A* and described in H/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1.* EUO activities were assessed to determine whether:

1. CSR requirements were implemented on the shop floor.

2. CSR requirements were identified in procedures and drawings.

3. CSRs were supported with appropriate technical bases for requirements.

Criticality safety was implemented in EUO through the use of Criticality Safety Requirements (CSR). These documents identified the passive and active design features and administrative requirements that were important to criticality safety. Requirements contained in CSRs were implemented in operational systems by flowing down administrative requirements into procedures and surveillance documentation and controlling passive and active design features by identifying important parameters to criticality safety in drawings and other systems. This was accomplished by a validation and implementation process for the CSRs involving Operations and Nuclear Criticality Safety Organization (NCSO) personnel. NCSO personnel evaluated new or revised operations in Criticality Safety Evaluations (CSE), which were used to generate CSRs.

A review of operational criticality safety was conducted by reviewing CSRs against operating procedures and field conditions. CSEs were reviewed to determine the basis of CSR requirements were implemented on the shop floor. This review only attempted to determine the adequacy of floor level criticality safety. Non-operations specific aspects of criticality safety were not reviewed unless problems where found in the implementation of criticality safety at the shop floor level, and only then were programmatic aspects of criticality safety reviewed.

Overall, the criticality safety program had some major strengths. CSR requirements were clearly and consistently identified in procedures and drawings. Operations personnel were aware of, and dutifully followed, CSR requirements and administrative controls. When potential criticality safety problems were identified, appropriate actions were taken to stop operations and adequately address those problems. The criticality safety staff had a good relationship with Operations personnel and the engineers had a good floor-level presence. The NCSO staff were well versed in operations and had a good operational understanding of criticality safety.

However, a number of deficiencies in the program were observed. Some of these deficiencies were noted as weaknesses in the ORR Assessment Form for Criticality Safety while others were identified as findings for specific correction.

Several CSRs were reviewed for operations in Buildings 9212 and 9215. These included CSRs for O-Wing operations, M-Wing operations, ventilation systems, and container handling. Validation and implementation checklists associated with these CSRs were also reviewed to determine the rigor and degree of involvement of Operations and NCSO personnel in the implementation of the CSRs. The CSEs associated with these CSRs were also reviewed, but weakness in the documentation of the CSEs made a thorough review too time consuming for this ORR. Only one CSE (CSE-OW-060) received a detailed review. Several personnel were contacted from NCSO and Operations to determine their level of knowledge and familiarity with operations and criticality safety. These personnel were consulted to determine the depth of problems and weaknesses identified.

Particular attention was paid to operations in O-Wing. This was due to the cryptic nature of CSE documentation and to provide support to other team members in functional areas concerned with this operation. A number of problems were found with the CSRs and CSEs associated with O-Wing. These problems resulted in findings concerning uranium oxide accumulation in salt baths and operation of the ventilation system. In particular, the CSE documentation of the basis for the uranium oxide accumulation CSR limits in salt baths was less than adequate (Finding A1-CS-03). Additionally, the basis for the amount of uranium oxide that accumulates per billet or plate in salt baths could not be found; therefore, the basis for adherence to the CSR limits for the mass of uranium oxide allowed to accumulate in salt baths could not be followed (Finding A1-CS-01). Finally, no CSR restriction was placed on the O-Wing ventilation system although it had not been evaluated for enriched uranium operations (Finding A1-CS-02). A fourth finding (Finding A1-CS-04) is discussed in the Safety Documentation functional area of this report.

The deficiencies identified in the criticality safety area are as follows:

A1-CS-01	Finding	There is no documentation to support methodology to calculate uranium accumulation in the O-Wing salt baths. (Prestart)
A1-CS-02	Finding	The O-Wing ventilation system only addresses depleted uranium operations. (Prestart)
A1-CS-03	Finding	There is no basis for the established criticality safety limit for the O-Wing salt baths. (Prestart)

A1-CS-04	Finding	There is no documentation to support the acceptability of drip pans being used on the machine coolant centrifuge. (Prestart)

D. TRAINING AND QUALIFICATION (TQ)

The assessment in the area of training and qualification was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. Training and qualification requirements for operations personnel were documented in an EUO training and qualification program description and satisfied DOE Order 5480.20A, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*.

2. The incumbents met the requirements in (1) above, or an approved compensatory action was in place.

3. New or revised operating procedures had been reviewed for training implications and affected operations personnel had been trained, as required, before using the procedures.

4. Management qualifications were defined and incumbents met the requirements, or compensatory measures were in place.

5. Area-specific requirements for support organization personnel were established.

6. Support personnel working in the area met the area-specific requirements.

7. Training and qualification programs for support personnel were consistent with the Y-90 series plant procedures.

With the following exceptions, technical qualification requirements of DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*, were met.

a. The Order required immediate supervisors of personnel in certified positions to also be certified. M-Wing supervisors, a qualified position, were supervising workers in a certified position (A1-TQ-01).

b. The Order required control manipulations to be identified in the *Training and Qualification Program Descriptions* (TQPD) for certified positions. Control manipulations that could impact the chemical, physical, and metallurgical processes in EUO were not identified (A1-TQ-05).

c. Order requirements for education, operational evaluation, and annual training on abnormal and emergency procedures were not specified in TQPDs in all cases (A1-TQ-02).

d. The safety system training required by the Order was not provided for some maintenance workers who worked on safety systems in EUO (A1-TQ-08).

e. Order requirements for written examinations that showed which questions were missed by the student were not met (A1-TQ-03).

Operational evaluations were used by EUO as a basis for qualification of workers in certified positions. These evaluations were not always performed by persons with documented qualifications, and some evaluations were not completed in accordance with requirements of the evaluation checklist. Some evaluation checklists did not include the level of detail adequate to document the basis for evaluation results. Excessive use of simulations vice performance compromised the value of the evaluations for certification purposes (A1-TQ-04 and A1-TQ-09).

Training materials, lesson plans, and classroom presentations were adequate. However, the EUO program for training on procedure revisions, and associated field controls prior to completion of the training, were not always adequate. Workers and supervisors without required training on revised emergency operating procedures continued to perform normal activities in qualified positions without restriction (A1-TQ-07). Line management did not approve "no training required" decisions, and a non-EUO manager approved training needs assessments for new and revised emergency operating procedures (A1-TQ-06).

Management qualifications were defined and met by incumbents. However, mentors who supplemented EUO management personnel did not have defined training and qualification requirements (A1-TQ-10).

Training and qualification programs for support personnel were adequate and consistent with Y-90 series plant procedures.

Overall, performance in the training and qualification functional area will be adequate when actions needed to address the prestart findings are complete.

The deficiencies identified in the training area are as follows:

A1-TQ-01	Finding	The M-Wing supervisor, a qualified position, supervised personnel in certified positions. (Prestart)

A1-TQ-02	Finding	The EUO Training and Qualification Program Descriptions did not contain all DOE Order 5480.20A requirements. (Poststart)
A1-TQ-03	Finding	The EUO training files did not contain all required examination records. (Poststart)
A1-TQ-04	Finding	Some personnel who were conducting operational evaluations and performance documentation checklists were not qualified. (Prestart)
A1-TQ-05	Finding	Control manipulations associated with EUO operations were not adequately addressed. (Poststart)
A1-TQ-06	Finding	Assessment of training on new and revised procedures did not ensure identification of needed training. (Prestart)
A1-TQ-07	Finding	EUO operations personnel were performing duties without meeting all of the training requirements. (Prestart)
A1-TQ-08	Finding	Some maintenance personnel were working on EUO safety systems without all the required training. (Prestart)
A1-TQ-09	Finding	Qualification programs for certified positions did not always ensure personnel were properly qualified. (Prestart)
A1-TQ-10	Finding	The training program for EUO mentors was not defined. (Poststart)

E. DRILLS (DR)

The assessment in the drills area was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. Drills required by the EUO emergency drill program covered the hazards identified in the Basis for Interim Operations (BIO) for Phase A1 processes.

2. Facility personnel were trained on the emergency response program.

3. Scheduled emergency drills were completed with satisfactory results, and deficiencies were addressed.

4. An EUO operations drill program was in place.

5. Credible operations drill scenarios involving Phase A1 processes were identified and drills were developed for these scenarios.

6. A representative sample of operations drills had been conducted with satisfactory results.

Review of documents and records associated with the emergency drill program revealed over eight percent of EUO personnel had not been trained on emergency response (Finding A1-DR-03), no method was available to ensure emergency drill deficiencies were adequately addressed, the available emergency drill scenarios did not cover the hazards identified in the BIOs, and none of the emergency drills conducted within the last 12 months were graded satisfactory or unsatisfactory (Finding A1-DR-02).

In the contaminated, injured worker emergency drill observed, there were significant coordination and drill simulation deficiencies. The drill was graded unsatisfactory by Emergency Management Organization personnel and the ORR team. The emergency drill program did not meet the criteria of Core Objective 21 (Finding A1-DR-01).

Review of the documents and records associated with the operations drill program revealed that a documented operations drill program existed, credible Phase A1 process scenarios had been identified, drills/exercises had been developed for these scenarios, and a representative sample of these drills/scenarios had been satisfactorily conducted. Two routine operations drills were observed. One drill involved the failure of a high capacity evaporator pump diaphragm, resulting in an operator being sprayed with acidic, radioactive solution. The other drill involved a uranium metal chip fire at a lathe. Neither drill required actual running of equipment. This reflected a management decision to simulate equipment operation. Control of the drills by the respective drill teams was satisfactory. The EUO routine operations drill program met the criteria of Core Objective 22.

The deficiencies identified in the drill area are as follows:

A1-DR-01	Finding	The emergency drill did not meet the criteria of Core Objective 21. (Poststart)
A1-DR-02	Finding	Emergency drill results do not indicate whether or not they are completed satisfactorily. (Poststart)
A1-DR-03	Finding	Not all EUO personnel have been trained on the required emergency response module. (Prestart)

F. STARTUP PROGRAM (S/U)

The assessment in the startup program area was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. A formal plan was in place to ensure smooth transition from restart to routine operations.

2. The plan provided monitoring and control when Phase A1 processes were to be initially used for production or normal operation.

The startup program review verified a formal program was in place that would ensure a smooth transition from restart to routine operations. It would provide adequate monitoring and control for Phase A1 processes when there were initially used for production or normal operation.

The startup test packages for Stack 38 ventilation exhaust system, the rolling and forming billet salt baths, and M- and O-Wing accountable vacuum systems were reviewed. Identified material deficiencies were walked down to determine if they were resolved. All material deficiencies were either corrected, technically justified to be allowed to exist, or the system was controlled to not allow use with enriched uranium until the deficiencies were resolved.

The startup program was adequate to support Phase A1 restart.

G. MODIFICATIONS (MD)

The assessment in the modification area was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. The change control procedure was approved.

2. The change control procedure required that Unreviewed Safety Question Determinations (USQD) or USQD screening work sheets be performed for changes.

3. Personnel were trained on the change control procedure.

4. Modifications were installed in accordance with the approved procedures.

5. Change packages for approved modifications to Phase A1 processes required a review for impact on operating procedures.

6. A change control process was in place to ensure that future modifications were reviewed for impact on procedures.

7. Training materials and activities were consistent with equipment and operating procedures for safety significant components (SSC) credited for facility safety.

8. Change control packages for approved modifications were reviewed for impacts on procedures and related training as needed.

9. A process was in place to ensure that training plans were reviewed when training was impacted by modifications.

Procedure Y10-37-036, *Configuration Management - Change Control Process*, Procedure Y10-153, *Temporary Modification Control*, and other related procedures were reviewed to ensure they were properly approved, complete, understood by technical support and engineering personnel involved in the change process, and followed as required. No problems were found with the exception of the need to provide more comprehensive guidance regarding post-implementation testing (Finding A1-MD-03) and the need to clearly identify all related databases that may be impacted by each change (Finding A1-MD-02). The procedures that govern the change process will meet the ORR criteria if these two findings are properly addressed.

A general facility walk down was performed and no uncontrolled modifications were found. Two recent change request packages were also walked down and were found to be installed per the approved change requests with the exception of an incorrectly closed Maintenance Job Request (MJR) and Deficiency Report (DR) (Finding A1-MD-01).

The training requirements for technical support and engineering personnel were reviewed to determine if the proper training had been provided to help ensure understanding of the approved procedures. Although job-specific training requirements for technical support and engineering personnel (beyond unreviewed safety question (USQ) training) had not been defined. No findings were written in this area because the Training Implementation Matrix does not require this training to be implemented until 1999.

A positive observation was the assignment of two design engineers to review all MJRs prior to performing work for possible unauthorized modifications.

In order to determine if facility modifications were consistent with the safety documentation, USQ sheets from six change request packages were reviewed to ensure they were complete, accurate, and consistent with Procedures Y10-37-036 and Y70-809. No problems were found in this area. Technical support and engineering personnel received formal USQ training and demonstrated a high level of understanding.

A walk down of two recent change request packages (EUO-1998-087 and EUO-1998-126) resulted in one finding. EUO-1998-87 modified the Stack 38 housing to prevent system leaks. A DR and MJR were written to replace an existing 1/8-inch plate with a 1/4-inch plate. Although the plate had not been replaced, the DR and MJR were closed (Finding A1-MD-01).

A review of six change request packages was performed to determine if the approved changes properly identified other documents (such as operating procedures, drawings, etc.), which may be impacted by the change. No problems were found in this area, except the need to clearly identify all related databases that may be impacted by each change (Finding A1-MD-02).

The change control process as described in Y10-37-036 met the ORR criteria for ensuring that future modifications will be reviewed for impact on other documents. This is satisfactorily accomplished through multiple reviews by the technical support process engineer, the operations manager, and the multi-disciplined Change Control Board. All are instructed, by procedure, to identify affected documents.

Procedure Y10-37-036 ensures that each change request package is reviewed for its impact on training. This requirement is discussed in detail in several sections of the procedure. A review of six change request packages supported this conclusion.

The deficiencies identified in the modifications area are as follows:

A1-MD-01	Finding	A modification of Stack 38 was not completed as required by the modification package. (Poststart)
A1-MD-02	Finding	The configuration management system does not consider data bases. (Poststart)
A1-MD-03	Finding	Post modification tests are not adequate to ensure systems meet the design limits. (Poststart)

H. MANAGEMENT (MG)

The assessment in the management area was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A1*. EUO activities were assessed to determine whether:

1. The EUO organization was clearly documented and known to division personnel.

2. Interfaces with tenant and support organizations were clearly documented.

3. Position responsibilities were clearly documented for the key operations positions.

4. Operations management was clearly documented as being responsible for safe operation.

5. There were formally established deficiency identification and handling processes.

6. The deficiency identification and handling processes were understood by responsible operations personnel.

7. Identified health and safety deficiencies and issues that apply to Phase A1 processes were categorized as pre- or post-start.

8. Prestart deficiencies were corrected or were on schedule for closure before restart.

9. Poststart deficiencies were tracked for closure.

10. Order noncompliances were identified in a compliance assessment and were corrected or had RFAs approved by DOE.

11. Management had established and communicated a commitment to safety and environmental compliance.

12. Safety problems were reported, prioritized, and tracked in a deficiency tracking system.

13. The management programs identified in Section 5.8 of the OSRs were in place as far as they applied directly to the Phase A1 processes and activities.

The EUO organization manual contained numerous organization charts for the various parts of the organization up to the EUO facility manager. Many of the positions on the charts were not filled. However, based on the review of CO-18, minimum staffing requirements were being met for all levels of the organization. The manual also contained a list of staff assignments, which included primary responsibilities as well as collateral duties. In addition, the manual contained the Job Descriptions for the positions reflected on the organization chart. The Job Descriptions clearly defined operations management as being responsible for safe operation of EUO facilities.

The Management Self-Assessment was completed on February 20, 1998, and the report stated: "...as a compensatory measure, qualified mentors will be assigned to all work activities affecting the authorization basis until operators and supervisors demonstrate sufficient conduct of operations understanding and discipline to alleviate the need for mentors." Y/MA-7309 and Y/MA-7367 were the two documents intended to define when mentors were required and how a determination was made that mentors were no longer required. With the exception of one statement in Y/MA-7367, which required mentors the first time certain procedures were used, there was no definitive statement that required mentors be present at any other times. The documents described how one would decide if mentors were needed (Finding A1-MG-02).

Attachment 4 of the readiness to proceed memo was a "manageable list" of open pre-start items. It contained an Energy Systems Action Management System (ESAMS) report, a punch list of fire protection items, and a Phase A1 Punch List. The deputy for transition and integration and the Process Based Restart (PBR) program manager said these items contained a total list of Phase A1 open pre-start issues. However, the technical support manager provided a list of 174 items from the Management Independent Assessment (MIA) had been reclassified from poststart to prestart about two weeks before the beginning of this Operational Readiness Review (ORR). These items were not on any of the lists of prestart items. There was also no single list or person who could specifically identify all actions required to be completed prior to restart (Finding A1-MG-01).

The assessments manager indicated that an EUO specific order compliance assessment had been conducted in 1997 and documented in a July 7, 1997, *Y-12 Enriched Uranium Operations Compliance Assessment Report*. Implementation was addressed in the Management Self Assessment conducted as part of the EUO restart process. He described the process for incorporating DOE Orders into EUO command media as follows. DOE Orders were incorporated into Y-12 Standards/Requirements Identification Documents (S/RID); Y-12 S/RIDs were incorporated into Y-12 command media; and Y-12 command media requirements were incorporated into EUO command media. He said the EUO S/RIDs were essentially identical to the Y-12 S/RIDs.

Section 5.8, Administrative Control Programs, of the Building 9212 and Building 9215 Operational Safety Requirements were reviewed to determine what programs were identified. There were 16 programs established as administrative controls. As a result of the overall ORR process, seven of these programs were determined to be within the Plan of Action and received a detailed review. Those areas reviewed by the team were as follows:

a. Unreviewed Safety Question Determination Program

b. Nuclear Criticality Safety Program

c. Training Program

d. Conduct of Operations

e. Configuration Management Program

f. Initial Testing and In-Service Surveillance Program

g. Safety Analysis Review Program

Detailed discussions, findings, and overall conclusions of reviews are addressed elsewhere in this report. These details include interviews with key personnel, performance-based observations associated with those programs and functional areas and walk down of structures, systems, and components covered by the programs.

There was an identified weakness in the area of disciplined operations (Finding A1-MG-04). There was a demonstrated lack of rigor associated with documenting bases or methodologies to support conclusions that impacted safety decisions. Additionally, when training deficiencies were identified, actions to correct the deficiencies were only taken in the area of "paper" fixes without taking appropriate compensatory measures to address the situation. Further, the corrective action closure process was found to be inadequate to support restart of Phase A1 processes (Finding A1-MG-03).

The deficiencies identified in the management areas are as follows:

A1-MG-01	Finding	There is no single list that identifies all prestart items. Also, no single person is aware of all open prestart items. (Prestart)
A1-MG-02	Finding	There is no specific requirement to have mentors present during operations. (Prestart)

A1-MG-03	Finding	Deficiencies are being closed before corrective actions are complete. (Prestart)
A1-MG-04	Finding	The need for disciplined operations is not demonstrated by all managers and supervisors. (Prestart)

I. SURVEILLANCES (SV)

The assessment in the surveillance area was performed against requirements established in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A*, and described in Y/MA-7332, *Operational Readiness Review Implementation Plan for the Enriched Uranium Operations Restart Phase A*. EUO activities were assessed to determine whether:

1. Phase A1 SSC credited for facility safety was inspected and tested for OSR and CSR requirements.

2. Surveillance procedures were approved.

3. Surveillances specified in the OSRs and CSRs were current and future ones were scheduled.

4. Preventive maintenance and calibration required to keep the systems operable, as defined by OSRs, were identified and scheduled in the appropriate preventive maintenance or calibration programs.

5. Deficiencies were identified and categorized, prestart deficiencies were corrected, and systems were confirmed to be operable after maintenance.

6. Instruments that monitored OSR and CSR requirements were calibrated at the time of use.

The recently developed Initial Testing and In-Service (IT&IS) Program Description and Procedure Y10-37-046, *Enriched Uranium Operations Surveillance Program*, were reviewed for accuracy and completeness and discussed with the responsible technical support and engineering personnel to determine their knowledge and understanding of the surveillance process. Interviews and document reviews were also conducted to evaluate the methods used to track and control surveillances. OSR and CSR required surveillance procedures were found to be approved, current, and properly scheduled with two exceptions:

a. The last required surveillance test of Building 9215 machine cooling settling trays was not conducted as scheduled (Finding A1-SV-03).

b. The casting furnace cooling water check valves had not been demonstrated to meet their intended safety functions prior to use during a casting furnace run (Finding A1-SV-01).

A review of the Measuring and Test Equipment (M&TE) and Preventive Maintenance (PM) program was conducted to determine if instruments used to monitor OSR requirements were properly calibrated. This process had been recently upgraded to address previous problems and concerns. Although little performance-based information was available, the new program appeared to adequately address known problems, and no findings were written in this area, with the exception of the casting furnace cooling water return check valves, where the as-found condition had not been recorded during surveillance testing (Finding A1-SV-02).

An extensive review was recently conducted by technical support personnel to identify test equipment and tools necessary for conducting OSR-related surveillance tests. However, this review did not formally identify test equipment and tools needed to satisfy CSR requirements (Finding A1-SV-04).

Overall, performance in the surveillances functional area will be adequate when actions needed to address the prestart findings are complete.

The deficiencies identified in the surveillances areas are as follows:

A1-SV-01	Finding	The casting furnace cooling water return check valves have not been demonstrated to meet their intended safety function. (Prestart)
A1-SV-02	Finding	The as-found conditions are not recorded during surveillance testing. (Prestart)
A1-SV-03	Finding	The required surveillance test for the machine cooling settling trays was not conducted. (Prestart)

III. ACRONYMS

BIO	Basis for Interim Operations
COO	Conduct of Operations
CRAD	Criteria and Review Approach Documents
CSE	Criticality Safety Evaluations
CSA	Criticality Safety Approvals
CSR	Criticality Safety Requirements
DMC	Document Management Center
DNFSB	Defense Nuclear Facility Safety Board
DOE	Department of Energy
DR	Drills
DR	Deficiency Report
DU	Depleted Uranium
ESAMS	Energy Systems Action Management System
EU	Enriched Uranium
EUO	Enriched Uranium Operations
IT&IS	Initial Testing and In-Service
JPA	Job Performance Aids
LMES	Lockheed Martin Energy Systems, Inc.
MD	Modifications
MG	Management
MIA	Management Independent Assessment
MJR	Maintenance Job Request
M&TE	Measuring and Test Equipment
NCSD	Nuclear Criticality Safety Department
NCSO	Nuclear Criticality Safety Organization
OP	Operations
ORR	Operational Readiness Review
OSR	Operational Safety Requirements
PBR	Process Based Restart
PM	Preventive Maintenance
POA	Plan of Action
PR	Procedures
RWP	Radiological Work Permit
SC	Safety Class
SD	Safety Documentation
SS	Safety Significant
SSC	Structures, Systems, and Components
S/U	Startup Program
SV	Surveillance

TQ	Training and Qualification
TQPD	Training and Qualification Program Description
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determinations

APPENDIX A

Implementation Plan

Y/MA-7332

Lockheed Martin Energy Systems, Inc.
Operational Readiness Review
Implementation Plan
for the
Enriched Uranium Operations
Restart Phase A1
at the
Oak Ridge Y-12 Plant

APPROVED: J P Flynn 2/17/98
J. P. Flynn, ORR Team Manager

February 1998
Revision 2

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I. INTRODUCTION

A. General

This implementation plan has been prepared to comply with the requirements of U.S. Department of Energy (DOE) Order 425.1, *Startup and Restart of Nuclear Facilities*, and DOE-STD-3006-95, *Planning and Conduct of Operational Readiness Reviews (ORR)*. The scope of the ORR is described in Y/MA-7316, *Operational Readiness Review Plan of Action for Enriched Uranium Operations Restart Phase A* (the POA), which was prepared by the Oak Ridge Y-12 Plant line management and approved by the DOE manager, Oak Ridge Operations, on January 16, 1998.

The DOE manager, Oak Ridge Operations, is the designated restart authority.

This implementation plan provides the overall approach and guidelines for the performance of the Phase A1 ORR. Appendix 1 includes the Criteria and Review Approach Documents (CRAD), which define the review objectives and criteria as well as the approach for assessing each objective. Results will be provided in a report that is discussed in Section IX of this implementation plan.

Operations at the Y-12 Plant were suspended as a result of a review of Building 9204-2E containerized storage operations and applicable Criticality Safety Approvals (CSA) on September 22, 1994. The review found violations of administrative safety controls associated with material storage arrays. Operations personnel, upon discovery of the criticality safety violation, did not immediately administratively control the area, i.e., ensure that personnel were kept at a safe distance from the array. They also did not immediately notify Nuclear Criticality Safety Department (NCSD) personnel or the plant shift superintendent. This was a violation of Y-12 Plant training and procedures. Following the event, all CSAs were walked down, seven categories of criticality safety nonconformances were identified, and a total of 1,344 individual deficiencies were noted.

The data from the evaluation of the CSA walkdowns, the occurrence report covering the initial infraction, the Type "C" Investigation, and Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-04 indicate the basic cause to be a lack of rigor in Conduct of Operations that permitted less than strict compliance with procedures. The issue was not one of operations being outside the safety envelope--the primary safety controls remained intact. Rather, the issue was the need to improve organizational performance and greater assurance in the safety management process of daily operations. Within the umbrella of conduct of operations, the principal failure was the result of personnel not following procedures with the rigor required. The lack of training on CSAs was also a contributing factor.

B. Y-12 Plant

The Y-12 Plant is one of two installations in Oak Ridge, Tennessee, managed by Lockheed Martin Energy Systems, Inc. (LMES) for DOE. LMES also manages the East Tennessee Technology Park. For four decades, the Oak Ridge Y-12 Plant has been and remains the national center for the handling, processing, storage, and disassembly of DOE-controlled enriched uranium (EU) materials and components, as well as depleted uranium and other special materials components.

The DOE defense programs at the Y-12 Plant include the dismantling of nuclear weapons components returned from the national arsenal, serving as the nation's storehouse for special nuclear materials, maintaining nuclear weapons components production and stockpile support capability, and providing special production support for other DOE programs and customers. In addition, as the primary EU repository for the United States, the Y-12 Plant has the facilities and security systems for EU storage, chemical recovery and material purification, and fabrication.

C. Enriched Uranium Operations Restart Phase A1 Activities

The EUO Organization primarily supports DOE defense programs. The facilities involved in this restart will support defense programs. The facilities will process enriched uranium from dismantled nuclear weapons into a form for long-term storage. These facilities also support nondefense programs by producing or recovering enriched uranium from unirradiated research reactor fuel, recovering enriched uranium from salvage materials to support accountability, and providing purified metal to nonweapons customers. Other missions are identified on an as-needed basis by DOE and other customers.

The metal working processes being restarted in Phase A1 are in E-wing of Building 9212 (casting), M-wing of Building 9215 (machining), and O-wing of Building 9215 (rolling and forming). The Phase A1 accountability processes are in the Building 9212 complex and the Building 9818 complex. These processes are supported by the radiography and density inspections performed in Building 9981 and dimensional inspections performed in Building 9998.

1. Building 9212 Operations Area

The enriched uranium casting operation employs vacuum-induction casting furnaces, metal shearing and breaking, light machining, and casting by-product handling. This operation is located in Building 9212 E-Wing.

The enriched uranium accountability operations are performed by bulk reduction, dissolution, and evaporation. Enriched uranium is placed in can and safe bottle arrays for in-process storage. These equipment and storage areas are located in the Headhouse and B-1, C-1, D-1, and E- Wings of Building 9212. Operation of the dissolution process is supported by the chemical makeup; organic treatment; and nitric acid and aluminum nitrate recycle operations in the Building 9818 complex located west of Building 9212.

Ancillary equipment (such as exhaust fans) is located in C-1Wing, adjacent buildings, or on the roof of Building 9212.

Uranium oxides are produced from a uranyl nitrate solution using dissolution, precipitation, furnaces, and particle-sizing operations in Rooms 1021, 1022, and 1010 of Building 9212. Shipping and receiving are conducted in Room 1004.

Radiography and density inspections in support of EUO are performed in Building 9981.

2. Building 9215 Operations Area

The machining operations of enriched uranium are performed in M-Wing of Building 9215. These operations are performed on the numerically-controlled/manually-operated lathes, mills, borers, and grinders. Significant support equipment for these operations includes chuck vacuum and machining coolant systems. The enriched uranium chips generated by the machining operations are transported to E-Wing of Building 9212 for further processing or storage. This chip processing includes cleaning, drying, and briquetting of the chips prior to recasting.

Enriched uranium rolling and forming are performed in O-Wing of Building 9215. Equipment and operations necessary to produce a wrought part include molten salt baths, a rolling mill, water rinse systems, mechanical leveling and shearing, heat treatment ovens, hydroform, and several material conveyance devices.

Dimensional inspections in support of enriched uranium casting and forming operations are performed in Building 9998, which is connected to M-Wing of Building 9215.

II. PURPOSE

The Phase A1 ORRs will determine if Y-12 Plant personnel are ready to restart the Enriched Uranium Operations described in Appendix A, Table A1, of the POA.

III. SCOPE

A. Breadth of the ORR

The Phase A1 LMES and DOE ORRs will review the metal working (casting, machining, and rolling and forming) operations plus some supporting accountability processes. The Phase A1 ORRs will also review all administrative and safety management programs (e.g., the emergency management program).

All 32 contractor core objectives (CO) will be assessed during Phase A1. The review will cover both administrative and safety management programs and their implementation for Phase A1 processes.

The scope of the ORRs, as defined in the approved POA, includes the following core objectives. The POA includes additional discussion concerning the scope or focus intended for each CO. The individual CRADs have incorporated this additional specificity.

CO-1. Facility safety documentation is in place that describes the safety envelope of the facility. (CR-4)

CO-2. The safety documentation characterizes hazards and risks and identifies mitigating measures to protect worker and public safety from the characterized hazards. (CR-4)

CO-3. Safety systems are defined in the facility safety documentation. (CR-4)

CO-4. There are adequate and correct safety limits for operating systems. (CR-1)

CO-5. Programs to control the design and modification of facilities and safety-related utility systems is in place. (CR-4)

CO-6. Facility systems, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis. (CR-15)

CO-7. There are adequate and correct procedures for operating systems and utility systems. (CR-1)

CO-8. Modifications to the facility have been reviewed for potential impacts on procedures and procedures have been revised to reflect these modifications. (CR-18)

CO-9. Facility procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis. (CR-15)

CO-10. A program is in place to confirm and periodically reconfirm the condition and operability of safety systems, safety-related process systems, and safety-related utility systems. (CR-5)

CO-11. Safety systems and other instruments which monitor Technical Safety Requirements are monitored for calibration. (CR-5)

CO-12. All safety and safety-related utility systems are currently operational and in a satisfactory condition. (CR-5)

CO-13. Training and Qualification programs for operations personnel have been established, documented, and implemented that cover the range of duties required to be performed. (CR-2)

CO-14. Technical qualifications of contractor personnel responsible for facility operations are adequate. (CR-19)

CO-15. Modifications to the facility have been reviewed for potential impacts on training and qualification. (CR-18)

CO-16. Training has been performed to the latest revision of procedures. (CR-18)

CO-17. Level of knowledge of operations personnel is adequate based on reviews of examinations, exam results, selected interviews, and observation of work performance. (CR-3)

CO-18. There are sufficient numbers of qualified personnel to support safe operations. (CR-13)

CO-19. The implementation status for DOE 5480.19, *Conduct of Operations Requirements for DOE Facilities*, is adequate for operations. (CR-12)

CO-20. Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements and, through their actions, demonstrate a high-priority commitment to comply with these requirements. (CR-14)

CO-21. An emergency drill program, including program records, has been established and implemented. (CR-9)

CO-22. A routine operations drill program, including program records, has been established and implemented. (CR-9)

CO-23. Managerial qualifications of contractor personnel, responsible for facility operations, are adequate. (CR-19)

CO-24. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management responsible for control of safety. (CR-11)

CO-25. A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor. (CR-6)

CO-26. A systematic review of the facility's conformance to applicable DOE Orders has been performed. (CR-7)

CO-27. Non-conformances to applicable DOE Orders have been justified, and schedules for gaining compliance have been justified in writing and formally approved. (CR-7)

CO-28. An adequate startup or restart test program has been developed that includes adequate plans for graded operations testing to simultaneously confirm operability of equipment, the viability of procedures, and the training of operators. (CR-10)

CO-29. A program is established to promote a site-wide safety culture. (CR-14)

CO-34. Management programs are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure support services are adequate for operations. (CR-8)

CO-35. Training and Qualification programs for operations support personnel have been established, documented, and implemented that cover the range of duties to be performed. (CR-2)

CO-36. Level of knowledge of operations support personnel is adequate based on reviews of examinations, exam results, selected interviews, and observation of work practices. (CR-3)

B. Depth of the ORR

Depth refers to the level of analysis, documentation, or action by which a particular CO is assessed. Variations in the depth are obtained by the number of criteria that are used to assess a given CO or by the intensity of the review approaches. The review approaches include documentation checks, interviews, walkdowns, and observation of evolutions. Increased depth is attained by applying more of the review approaches for a given criterion or objective. The depth to which the different COs are assessed varies, depending on the particular facility characteristics and according to the degree to which the requirement contributed to the incident on September 22, 1994. The graded approach, as described in Appendix 1 of DOE-STD-3006-95, is used to assist the team members in determining the appropriate assessment depth.

IV. ORR PREREQUISITES (PR)

Several prerequisites have been identified that must be complete before the Phase A1 LMES ORR begins. These prerequisites consist of management plans and reviews necessary to ensure line management readiness to proceed. Specifically, the prerequisites are as follows:

PHASE A1 LMES ORR

PR-1: The Building 9212 and Building 9215 BIOs and OSRs must be approved and implemented in accordance with approved implementation plans. Criticality Safety Requirements (CSR) must be approved and incorporated into operating documents (applies to COs 1, 2, 3, 4, 9, 10, 11, 12, and 34).

PR-2: Change control and document control procedures must be issued and in use. The change control procedure must ensure that modifications satisfy design requirements; that Unreviewed Safety Question Determinations (USQD) are made as required; and that procedures and training are revised, as appropriate. A document control process must ensure that documents used for decisions affecting safety are current and accurate (applies to COs 5, 6, 7, 8, 9, 15, and 34).

PR-3: Process modifications must be identified in the EUO change request database (applies to COs 6, 8, 9, and 15).

PR-4: For each process the following must be complete: essential modifications and maintenance, process drawings, process procedures or Job Performance Aids (JPA), CSRs, scheduled Operational Safety Requirements (OSR) surveillances, inspection and testing, and scheduled maintenance and calibration (applies to COs 6, 7, 8, 9, 10, 11, 12, 28, and 34).

PR-5: Conduct of Operations practices must be implemented in accordance with the *Nuclear Operations Conduct of Operations Manual* as stated in RFA LMES/Y-12-DOE-5480.19-CSA-162 (applies to COs 10, 11, 19, 20, 24, and 34).

PR-6: Training and qualification requirements must be identified for key operations and support positions. Personnel assigned to positions must be trained and qualified to meet applicable requirements. Alternately, compensatory measures must be in place to support the personnel (applies to COs 13, 14, 15, 17, 18, 20, 23, 28, and 34).

PR-7: Drills and/or exercises must be developed for credible accident scenarios for high-risk processes. Emergency management plans must address hazards as defined in the Bases for Interim Operations (BIO). A representative sample of drills/exercises must be conducted with satisfactory results for these scenarios (applies to COs 21, 22, and 34).

PR-8: Operations and support personnel must be trained and qualified to perform assigned tasks (applies to COs 18, 24, and 34).

PR-9: The operating organization must be in place and key positions must be staffed to or above minimum levels established in the BIO and OSR. Interfaces with tenant and support organizations must be documented and communicated (applies to COs 18, 24, and 34).

PR-10: The Energy Systems Action Management Systems (ESAMS) and EUO deficiency report process must be in place. Open deficiencies and issues must be entered into the appropriate system for tracking and closure. Pre-start deficiencies must be identified and closed, with the exception of a manageable list of findings that have a well-defined schedule for closure before restart (applies to COs 25, 29, and 34).

PR-11: An assessment of compliance with administrative controls for the Standards/Requirements Identification Documents (S/RID) functional areas of interest must be completed. Results must be evaluated and placed in the appropriate deficiency tracking system. Requests for Approval (RFA) must be approved by DOE for noncompliances with DOE Orders important to health and safety (applies to COs 26,27, and 34).

PR-12: A transition plan defining steps to reach normal operations must be developed and approved. The plan must define the organization, process start-up controls, and compensatory measures that will be in effect during each restart phase and into steady-state operation. The restart plan provides a basis for the transition plan (applies to CO 28).

PR-13: Line management must clearly communicate to all personnel a commitment to safety and environmental compliance (applies to CO 29).

PR-14: A management self assessment (MSA) must be performed to assess readiness for the LMES ORR. The MSA must verify that these prerequisites are complete and that the facility is ready for the LMES ORR. Deficiencies must be evaluated and corrective actions must be approved.

PR-15: The vice president, Restart Operations, must certify that readiness has been achieved for the Phase A1 LMES and DOE ORR.

V. OVERALL APPROACH

The ORR will provide LMES senior management with an independent, objective measurement of the readiness to resume Phase A1 of Enriched Uranium Operations. The ORR will also be an indicator that the Y-12 Plant has a management team with a satisfactory level of proficiency to resume these activities. The following paragraphs outline the sequence of the ORR.

A. Y-12 Line Management Readiness-to-Proceed Certification

Upon completion of the Y-12 management self assessment (MSA), including resolution of all prestart findings (with the exception of a manageable list of open prestart findings that have a well defined schedule for closure) the vice president, Restart Operations, will issue a readiness-to-proceed certification discussed in prerequisite PR-15. The LMES ORR will not begin until the vice president, Restart Operations, has provided this certification of readiness.

B. ORR

The ORR team members will review documentation and procedures; inspect equipment, systems and buildings; interview personnel; and observe simulated or actual evolutions as they are performed. The reviews conducted by each ORR team members will be guided by a set of CRADs included as Appendix 1. The level-of-knowledge interviews will determine the awareness of fundamentals and the retention of material included in the training programs. For specific evolutions, the team members will review the records and procedures, observe the evolution, witness the execution of the procedure and the generation of the records, and then follow up on pertinent issues with interviews. For example, if a mistake is noted during an evolution, operators with similar qualifications may be questioned concerning their response to a similar situation.

The ORR will place emphasis on reviewing samples of results or observing performance for adequacy. It will place less emphasis on systematic review of program structure and organization. However, if any portion of the review indicates a weak program, then further analysis of that program may be required.

The ORR is conducted in two phases, the first being a review of documents associated with the implementation of prescribed programs, for example, corrective actions following the September 22, 1994 event, revised procedures, radiological controls procedures implementation, and completed surveillances. These reviews will be evaluated against DOE and facility requirements. The second phase stresses preparation for operations to permit evaluation of the operational proficiency developed in preparation for resumption of Enriched Uranium Operations activities. This phase evaluates the level of knowledge of operators and selected support personnel. Emphasis is placed on any areas of concern identified during operations to determine if problems noted are of a general nature or are unique to an individual. This manner of review provides the ORR team with a focused picture of the readiness to resume Phase A1 of Enriched Uranium Operations activities.

At the completion of the ORR, a report will be prepared summarizing the review and commenting upon the readiness of Phase A1 of Enriched Uranium Operations to restart.

C. ORR Results Briefings

The team will give briefings on the conduct and results of the Phase A1 ORR to Y-12 management and, upon request, to senior LMES or DOE management for their information and to help them form their decision regarding startup.

VI. ORR TEAM PREPARATIONS

Prior to commencement of on-site ORR activities, training and familiarization for ORR team members will be conducted. It will consist of site and facility familiarization, necessary radiological and safety training for facility access, and development of the ORR implementation plan and associated CRADs. Each team member has assessment experience or appropriate training. No team member has any connection with EUO activities that impact his independence to review assigned functional areas. By their selection, the team manager certifies that team members are technically competent, have appropriate assessment experience, are independent, and will become familiar with the facility through the familiarization process described above. Team assignments and qualification summaries are contained in Appendix 2.

VII. LMES ORR PROCESS

The team manager, assisted by team members, has developed the CRADs for this review. These CRADs provide defined bases for conducting the ORR within the scope set forth by the core requirements and derived core objectives of DOE Order 425.1. The team manager will review the efforts of the team members to ensure that all objectives are thoroughly assessed. The CRADs are based on the combined expertise of the team members, DOE Orders and other requirements, the potential hazards of operations, and the findings of internal and external review groups.

VIII. ADMINISTRATION

The team will meet daily during the on-site review. These meetings will permit the team members to discuss significant observations or problems identified during the day and will permit the team manager to identify any trends or areas in which more detailed information may be required. It will also allow potential schedule difficulties or possible information gaps to be identified in time to take corrective action.

Reponsibility for the quality of the review process rests with the team manager and includes selection of all LMES ORR team members and daily on-site review of the findings of the team members.

IX. REPORTING AND RESOLUTIONS

A. Forms

During the conduct of the ORR, documentation of findings and observations and the assembly of objective evidence of operational readiness will be the responsibility of the individual team members in accordance with specific directions given below. Two types of administrative forms will be used to accurately document on-site inspection activities, findings, and observations.

The Assessment Form (Form 1) is used to document the methods and actions by a team member taken in his criteria evaluation process. Each Form 1 lists the means the team member has used to measure the site's performance relative to the objective provided in the CRADs. The form will be complete enough to allow an outside agency reviewing the form to follow the assessment logic and means used to verify the site's performance with respect to the objective and to thereby validate the ORR's completeness and adequacy. The write-up will clearly describe the approach taken to review the criterion. If for some reason the approach used does not exactly match the approach described in the CRAD, the reason will be documented. The conclusion will specify if the criteria for the particular objective have been met.

The Deficiency Form (Form 2) is used to document the issues revealed during the criteria evaluation process. A separate Form 2 should be generated for each issue related to a particular objective. For instance, in reviewing a CRAD or portion of a CRAD, a team member will generate a single Form 1 that describes the methods used in the investigation. If one distinct issue is discovered, the team member would then generate one Deficiency Form to detail the deficiency. A single Deficiency Form may be used to identify a generic problem for which a number of individual examples are listed. Clear communication is the objective, and the specific number of Deficiency Forms used to detail issues will necessarily be up to the discretion of the team member and team manager. Sample Assessment and Deficiency Forms are located in Appendix 3.

B. Finding Classification

A single issue or a group of related issues that have been documented on Deficiency Forms may constitute a finding. The team manager, in consultation with the team member(s), determines whether a finding is prestart or poststart. Appendix 4 provides the criteria to be used to aid in this determination. The results of this determination are documented on the Deficiency Form.

C. Lessons Learned

The team manager will report any problems or successes specific to the conduct of the ORR as Lessons Learned to aid future ORRs and will incorporate them into the final report. These will include lessons learned with respect to the ORR process itself, technical issues relating to the safe operation of DOE facilities, and interfaces with DOE in the ORR process.

D. Final Report

The team manager will develop a report to document the results of the ORR. This report will identify findings and observations found in the review and will identify findings as prestart or poststart.

Team members will be asked to sign the report, showing they concur with the report in the areas of their expertise. Dissenting opinions that have not been resolved will be appropriately addressed in the report. The team manager will transmit the ORR report to the vice president, Restart Operations.

The ORR report will be written with this format as a guide:

TITLE PAGE - The title page is the report cover and will state the subject and dates of the ORR.

SIGNATURE PAGE - This page will be for the signature of all ORR team members and will be used by the team manager in the final version of this report.

TABLE OF CONTENTS - The table of contents will identify all sections and subsections of the report, illustrations, tables, charts, figures, and appendices.

EXECUTIVE SUMMARY - This is a brief summary of the review process, the major or pre-start findings, and the readiness determination with appropriate recommendation.

INTRODUCTION - The introduction will provide information regarding the facility reviewed, the reason for the shutdown, and the purpose and the scope of the ORR. It will also contain a brief discussion of the overall objectives of the ORR, the review process, and team composition.

ORR EVALUATION - For each functional area, the report will discuss the objectives, the pre-start and post-start findings of that area, and provide conclusions as to readiness to commence operations.

LESSONS LEARNED - Problems or successes encountered during the review that could be applied to future ORRs, or to the construction, design or decommissioning of DOE facilities will be identified and documented in the report.

APPENDICES - Appropriate data will be provided as appendices to support the conclusions drawn in the report. These will include the following:

a. Implementation Plan
b. Criteria and Review Approach Documents (CRAD)
c. Team List and Qualification Summaries
d. Assessment Forms (Form 1)
e. Deficiency Forms (Form 2)
f. Dissenting Opinions (if applicable)

X. SCHEDULE

The LMES ORR is expected to begin approximately one week after line management certification of readiness and endorsement by the vice president, Restart Operations. The LMES ORR will require about two weeks to complete.

APPENDICES

Appendix 1:	Criteria and Review Approach Documents
Appendix 2:	Team Assignments and Qualification Summaries
Appendix 3:	ORR Assessment and Deficiency Forms
Appendix 4:	Finding Classification Criteria

APPENDIX 1

Criteria and Review Approach Documents (CRAD)

SAFETY DOCUMENTATION (SD)

Objectives

CO-1 Facility safety documentation is in place that describes the safety envelope of the facility. (CR-4)

CO-2 The safety documentation characterizes hazards and risks and identifies mitigating measures to protect worker and public safety from the characterized hazards. (CR-4)

CO-3 Safety systems are defined in the facility safety documentation. (CR-4)

CO-4 There are adequate and correct safety limits for operating systems. (CR-1)

Criteria

1. Safety documentation has been approved.

2. Safety documentation has been implemented according to approved plans.

3. Structures, systems, and components (SSC) credited for facility safety are identified in Section 2.6 of the Bases for Interim Operations (BIO).

4. Safety limits are discussed in Section 2 of the Operational Safety Requirements (OSR).

Approach

Record Review:

1. Review the following documents to ensure they were approved by appropriate LMES and DOE personnel:

   - Y/MA-7252, *The Basis for Interim Operations for Building 9212 Enriched Uranium Operations Complex*
   - Y/MA-7290, *The Basis for Interim Operations for Building 9215 Complex - Enriched Uranium Operations*
   - Y/MA-7255, *The Operational Safety Requirements for Building 9212 Enriched Uranium Operations Complex*
   - Y/MA-7291, *The Operational Safety Requirements for Building 9215 Complex - Enriched Uranium Operations*

2. Review at least the following number of Criticality Safety Requirements (CSR) from Table A1 of the Plan of Action to ensure they were reviewed and approved by appropriate personnel:

AREA	MINIMUM # OF CSRs TO REVIEW
Accountability	4
Casting	4
Machining	2

3. Review any implementation plans for BIOs, OSRs, and CSRs to determine that schedules are being met.

4. Review the BIOs and associated hazards analyses to determine that SSC credited for facility safety are contained in Section 2.6.

5. Review the BIOs, OSRs, and associated hazards analyses to ensure appropriate safety limits are discussed in Section 2 of the OSRs.

6. Review surveillance requirements to ensure they verify SSC operability.

Interviews:

Interviews will be schedules as necessary after record reviews are completed.

Shift Performance:

1. If appropriate, observe the implementation of any specified compensatory measures to determine that they are correctly implemented and effective.

2. Verify the implementation of OSR surveillances by walking down three surveillance procedures.

3. Walkdown safety systems to determine physical condition and housekeeping.

MODIFICATIONS (MD)

Objective

CO-5 Programs to control the design and modification of facilities and safety-related utility systems are in place. (CR-4)

Criteria

1. The change control procedure has been approved.

2. The change control procedure requires Unreviewed Safety Question Determinations (USQD) or USQD screening work sheets to be performed.

3. Personnel are trained on the change control procedure.

4. Modifications are installed in accordance with approved procedures.

Approach

Record Review:

1. Review the change control procedure to verify it has been approved.

2. Review the change control procedure to verify it requires completion of USQDs and USQD screening work sheets when appropriate.

3. Review training records to verify personnel are trained on the change control procedure.

4. Review modification packages to verify that modifications were installed in accordance with approved procedures.

Interviews:

Interview personnel associated with the configuration management program to assess their understanding of program requirements and responsibilities.

Shift Performance:

1. Perform a facility walkdown to determine if there are uncontrolled modifications to systems.

2. Verify that at least two recent modifications are installed as described in the modification package.

Objective

CO-6 Facility systems, as affected by facility modifications, are consistent with the descript of the facility, procedures, and accident analysis included in the safety basis. (CR-15)

Criteria

1. Processes are physically and functionally consistent with their descriptions in the BIOs, OSRs, a CSRs.

2. Approved USQDs document how facility modifications are consistent with safety documentati

Approach

Record Review:

Review completed USQDs and USQD screening work sheets to verify they ensure tl modifications are consistent with safety documentation.

Interviews:

Interview personnel responsible for developing, reviewing, and approving USQDs and supporti safety analyses for proposed activities to assess their understanding of the program, individı responsibilities, and safety basis documents.

Shift Performance:

1. Observe in-progress work for compliance with USQ review requirements.

2. Walk down a temporary modification, if one is in effect, and evaluate the accuracy of the tempor modification records and drawings.

Objective

CO-8 Modifications to the facility have been reviewed for potential impacts on procedures and procedures have been revised to reflect these modifications. (CR-18)

Criteria

1. Modification packages for approved modifications to processes require a review for impact on operating procedures.

2. A change control process is in place to ensure that future modifications are reviewed for impact on procedures.

Approach

Record Review:

1. Review modification packages to ensure appropriate procedure changes were identified and the procedure changes were completed prior to declaring the modified system operable.

2. Review the change control procedure to verify it requires modifications to be reviewed for impact on procedures and requires procedure changes to be completed prior to declaring the modified system operable.

Interviews:

Interviews will be conducted as part of CO-5.

Shift Performance:

None

Objective

CO-15 Modifications to the facility have been reviewed for potential impacts on training and qualification. (CR-18)

Criteria

1. Training materials and activities associated with modifications are consistent with operating procedures.

2. Modification packages for approved modifications to processes are reviewed for impact on training requirements.

3. A change control process is in place to ensure that future modifications are reviewed for impact on training requirements.

Approach

Record Review:

1. Review training material associated with modifications to ensure it is consistent with operating procedures.

2. Review modification packages to ensure appropriate training requirements were identified and completed prior to declaring the modified system operable.

3. Review the change control procedure to verify it requires modifications to be reviewed for impact on training and requires training to be completed prior to declaring the modified system operable.

Interviews:

Interviews will be conducted as part of CO-5.

Shift Performance:

None

SURVEILLANCES (SV)

Objective

CO-10 A program is in place to confirm and periodically reconfirm the condition and operability of safety systems, safety-related process systems, and safety-related utility systems. (CR-5)

Criteria

1. OSR-required surveillance procedures are approved.
2. OSR-required surveillance procedures are current.
3. Future OSR-required surveillances are scheduled.
4. Preventive maintenance (PM) and calibration required to keep systems operable, as defined by OSRs, are identified.
5. PM and calibration required to keep systems operable, as defined by OSRs, are scheduled.
6. Deficiencies in SSC credited for facility safety are identified.
7. Deficiencies in SSC credited for facility safety are categorized.
8. Pre-start deficiencies in SSC credited for facility safety are corrected.
9. SSC credited for facility safety is confirmed to be operable after maintenance.

Approach

Record Review:

1. Review OSR-required procedures to verify they are approved.
2. Review surveillance records to verify OSR-required surveillances are current.
3. Review surveillance schedules to verify future OSR-required surveillances are scheduled at appropriate intervals.
4. Review the OSRs and PM and calibration programs to verify that OSR-required PMs are identified.
5. Review the OSRs and PM and calibration programs to verify that OSR-required PMs are scheduled.
6. Verify that there are adequate and correct procedures for operating systems and utility systems.

7. Verify that modifications to the facility have been reviewed for potential impacts on procedures and procedures have been revised to reflect these modifications.

8. Verify that facility procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis.

9. Review maintenance records for SSC to verify that appropriate operability determinations are made before declaring equipment operable.

Interviews:

Interview personnel associated with the surveillance test program to assess their understanding of program requirements and responsibilities.

Shift Performance:

Observe the performance of at least three surveillances.

Objective

CO-11 Safety systems and other instruments that monitor Technical Safety Requirements are monitored for calibration. (CR-5)

Criterion

Instruments that monitor OSR requirements are calibrated.

Approach

Record Review:

1. Review calibration records to verify that instruments that monitor OSR requirements are calibrated.

2. Review calibration procedures to ensure they are consistent with the requirements of safety documentation.

Interviews:

. Interview personnel associated with the calibration program to assess their understanding of program requirements and responsbilities.

Shift Performance:

Observe at least one calibration activity.

Objective

CO-12 All safety and safety-related utility systems are currently operational and in a satisfactory condition. (CR-5)

Criterion

Systems credited for facility safety will be operable as defined.

Approach

COs 10 and 11 address this CO.

OPERATIONS (OP)

Objective

CO-17 Level of knowledge of operations personnel is adequate based on reviews of examinations, exam results, selected interviews, and observation of work performance (CR-3)

Criterion

Operations personnel have adequate knowledge of processes and requirements to fulfill their duties.

Approach

Record Review:

1. Review at least three completed qualification or certification examinations to determine if examinations adequately verify facility-specific level of knowledge.

2. Review the results of the examination administered during the MSA.

Interviews:

Interview at least two operators and two line managers, including front-line supervisors, to determine if they understand procedures, JPAs, OSRs, and CSRs.

Shift Performance:

1. Observe at least three simulations/evolutions performed by operating personnel to verify facility-specific level of knowledge is adequate.

2. Administer a written examination to operators/supervisors in two different qualification/certification areas to determine their level of knowledge.

Objective

CO-18 There are sufficient numbers of qualified personnel to support safe operations. (CR-13)

Criteria

1. Only qualified personnel are assigned to operations positions.

2. There are adequate numbers of qualified operators available to fill positions defined in operating procedures.

Approach

Record Review:

1. Review the documents that define the numbers and qualifications of operating personnel necessary to perform the tasks specified in the operating procedures to verify they require adequate numbers of operators for normal and off-normal conditions.

2. Review the tasks listed in procedures and determine if sufficient operating personnel are qualified on each task.

Interviews:

None

Shift Performance:

Observe at least three simulations/evolutions to determine if the numbers and qualifications of operating personnel are adequate.

Objective

CO-19 The implementation status for DOE 5480.19, *Conduct of Operations Requirements for DOE Facilities*, is adequate for operations. (CR-12)

Criteria

1. Programmatic elements of conduct of operations (COO) are in place, as defined in the *Nuclear Operations Conduct of Operations Manual.*

2. Personnel have been trained in key COO principles.

3. Weaknesses in COO have been identified and corrective or compensatory actions are in place.

Approach

Record Review:

1. Review recently completed operations logs, shift turnover documents, and other plant records of note to assess compliance with conduct of operations principles.

2. Review identified weaknesses in COO and compensatory actions.

Interviews:

1. Interview operators and supervisors to assess their understanding of the conduct of operations principles in the performance of their duties.

2. If these orders are not fully implemented, interview management personnel to ensure they are aware of the non-compliance(s) and action necessary to fully implement the order requirements, as well as current compensatory measures in the interim.

Shift Performance:

1. Observe at least three simulations/evolutions to determine if the facility is effectively implementing the conduct of operations requirements.

2. Attend shift turnovers, incident critiques, and pre-job briefings and observe control room activities, operator rounds, panel walkdowns, procedure use, communications, response to alarms, control of system status, and lockout/tagout activities.

3. Observe the implementation of any specified compensatory measures within the facility to determine their effectiveness.

PROCEDURES (PR)

Objective

CO-7 There are adequate and correct procedures for operating systems and utility systems. (CR-1)

Criteria

1. Approved operating procedures, including job performance aids (JPA) exist for normal, abnormal, alarm, and emergency conditions.

2. Operating procedures incorporate the requirements of the safety documentation.

Approach

Record Review:

1. Compare operating procedures with their associated CSRs to verify they are consistent with each other.

2. Verify that OSR requirements are contained in applicable operating procedures.

3. Review site and/or divisional procedure(s) to verify a viable system exists for the control and issuance of procedures and CSRs.

4. Verify the existence of a document control center that contains the latest revision of procedures, CSRs, and OSRs.

Interviews:

1. Interview operations personnel and supervisors to assess their understanding of the CSR and procedure revision process and how they verify the latest approved revision of a CSR or a procedure.

2. Interview operations support personnel for understanding of the procedure and CSR control processes.

Shift Performance:

1. Walk down at least five CSRs to verify the conditions in the field match the conditions required in the CSRs.

2. Verify that procedures, JPAs, and CSRs in use are the latest revisions.

3. Observe at least three simulations/evolutions to verify personnel are using the latest procedures and JPAs, and they are adequate and correct.

4. Observe response to at least one abnormal alarm or emergency condition.

Objective

CO-9 Facility procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis. (CR-15)

Criteria

1. A process is in place to ensure installed modifications are reflected in procedure revisions.

2. A process is in place to ensure procedure revisions are reviewed for consistency with safety documentation.

Approach

Record Review:

1. Review installed modifications to ensure they are reflected in procedure revisions.

2. Review the procedure change process to verify it requires procedure revisions to be reviewed for consistency with safety documentation.

Interviews:

Interview personnel associated with the procedure change process to assess their understanding of program requirements and responsibilities.

Shift Performance:

None

DRILLS (DR)

Objective

CO-21 An emergency drill program, including program records, has been established and implemented. (CR-9)

Criteria

1. The EUO emergency drill program has drills that cover the hazards identified in the BIOs.

2. Facility personnel are trained on the emergency response program.

3. Scheduled drills have been completed with satisfactory results.

4. Drill deficiencies have been adequately addressed.

Approach

Record Review:

1. Review the emergency drill program to ensure it contains drills that cover the hazards identified in the BIOs for processes.

2. Review TMS and other training records to ensure facility personnel have been trained on the emergency response program.

3. Ensure records for all emergency drills conducted in the last 12 months show that drill results were satisfactory and all identified deficiencies were satisfactorily addressed.

4. Review emergency drill records for the last 12 months to verify that EUO personnel have participated in at least one drill.

5. Review emergency drill program records to verify they meet the requirements of applicable procedures.

6. Review emergency drill scenarios to determine if they are adequate to satisfactorily assess personnel response to the simulated hazard.

Interviews:

1. Interview the Emergency Management Program Operations Manager to assess the adequacy of methods used to select drill scenarios and drill participants. Also assess his level of knowledge of the emergency drill program.

2. Interview the senior drill monitor for each emergency drill observed during the ORR to assess level of knowledge of the drill program.

3. Interview at least two EUO shift operations personnel to discuss their participation in the emergency drill program.

Shift Performance:

Observe at least one emergency drill, including pre-drill and post-drill activities.

Objective

CO-22 A routine operations drill program, including program records, has been established and implemented.

Criteria

1. The EUO operations drill program is documented.

2. Credible routine operations drill scenarios involving processes are identified.

3. Drills and exercises have been developed for each process scenario.

4. Records show that a representative sample of drills and exercises have been conducted with satisfactory results.

5. Drills and exercises have been conducted for credible accident scenarios for high-risk processes.

Approach

Record Review:

1. Review documentation of the EUO operations drill program to ensure it is formalized, approved, and meets the requirements of higher directives.

2. Review EUO drill scenarios to ensure they are credible and involve appropriate processes.

3. Verify drills and scenarios have been developed for each process scenario.

4. Review records to verify that a representative sample of drills and exercises have been conducted with satisfactory results.

5. Review drill records to verify drills and exercises have been conducted for credible accident scenarios for high-risk processes.

Interviews:

1. Interview the EUO routine operations drill program manager to assess the adequacy of methods used to select drill scenarios and drill participants. Also assess his level of knowledge of the routine operations drill program.

2. Interview the senior drill monitor for each routine operations drill or exercise observed during the ORR to assess level of drill program knowledge.

3. Interview at least two EUO shift operations personnel to discuss their participation in the routine operations drill program.

Shift Performance:

Observe at least two routine operations drills, including pre-drill and post-drill activities. Each drill will be in a different process area. One drill will be a credible accident scenario for a high risk process.

STARTUP PROGRAM (S/U)

Objective

CO-28 An adequate startup or restart test program has been developed that includes adequate plans for graded operations testing to simultaneously confirm operability of equipment, the viability of procedures, and the training of operators.

Criteria

1. A formal plan exists to ensure smooth transition from restart to routine operations.

2. The plan to ensure smooth transition from restart to routine operations provides monitoring and control when processes are initially used for production or normal operation.

3. Controls are in place to ensure that qualified personnel, during initial use, can operate equipment within applicable safety limits using the new or revised operating procedures of job performance aids (JPA).

Approach

Record Review:

1. Verify a formal and approved plan exists to ensure smooth transition from restart to routine operations.

2. Review the plan to ensure it adequately addresses monitoring and control when processes are initially used for production or normal operation.

3. Verify the plan delineates adequate controls to be in place to ensure qualified personnel, during initial use, can operate equipment within applicable safety limits using the new or revised operating procedures or JPAs.

4. Review system and equipment test records to verify process equipment has been adequately tested.

5. Verify all portions of the plan scheduled to be completed before restart have been completed.

6. Verify the plan includes all process equipment and systems.

Interviews:

None

Shift Performance:

Shift performance will be observed as part of COs-17, 18, and 19.

TRAINING AND QUALIFICATION (TQ)

Objective

CO-13 Training and Qualification programs for operations personnel have been established, documented, and implemented that cover the range of duties required to be performed.

Criterion

Operations personnel whose actions or decisions may directly impact the safety envelope must have training and qualification requirements documented in an EUO training and qualification program description.

Approach

Record Review:

1. Verify an EUO training and qualification program exists that satisfies DOE Order 5480.20A, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*.

2. Verify the program in (1) describes the training and qualification requirements for operations positions listed in Table A3 of Y/MA-7316, *Operational Readiness Review Plan of Action for EUO, Restart Phase A*.

Interviews:

None

Shift Performance:

None

Objective

CO-14 Technical qualifications of contractor personnel responsible for facility operations are adequate.

Criteria

1. Operations personnel (including the EUO organization manager and the nuclear operations manager) whose actions or decisions may directly impact the safety envelope, satisfy the technical qualification requirements of DOE Order 5480.20A, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*.

2. Technical qualifications for operations personnel are documented in an EUO training and qualification program description.

3. Records show that operations personnel meet the requirements of the EUO training and qualification program description or that an approved compensatory action is in place.

Approach

Record Review:

Verify that records show the individuals assigned to each of the operations positions in Table A3 of Y/MA-7316, *Operational Readiness Review Plan of Action for EUO, Restart Phase A*, meet the requirements of the EUO training and qualification program description or that an approved compensatory action is in place.

Interviews:

None

Shift Performance:

None

Objective

CO-16 Training has been performed to the latest revision of procedures.

Criteria

1. New or revised operating procedures have been reviewed for training implications.

2. Affected operations personnel have been trained, as required, in accordance with the *Nuclear Operations Conduct of Training Manual* before using a procedure.

Approach

Record Review:

1. Review records that list new or revised operating procedures.

2. Review records that indicate the procedures in (1) have been reviewed for training requirements.

3. Review records that list personnel that are required to be trained on the procedures in (1).

4. Review procedure training records and the pre-job briefing paperwork to verify involved personnel were trained in accordance with the *Nuclear Operations Conduct of Training Manual.*

5. Select ten procedure change notices and verify involved personnel were trained in accordance with the *Nuclear Operations Conduct of Training Manual.*

Interviews:

None

Shift Performance:

1. Observe two classroom training sessions held to train operations personnel on operating procedures.

2. Ensure operations personnel using new or revised operating procedures in operations and evolutions observed been trained on the applicable operating procedures in accordance with the *Nuclear Operations Conduct of Training Manual.*

Objective

CO-23 Managerial qualifications of contractor personnel, responsible for facility operations, are adequate. (CR-19)

Criteria

1. Management qualifications are defined.

2. EUO management personnel and subcontractors who supplement EUO management personnel meet the defined management qualifications.

Approach

Record Review:

1. Verify that written and approved documentation defines management qualifications.

2. Review records to identify the individuals assigned to the managerial positions listed in Table A3 of Y/MA-7316, *Operational Readiness Review Plan of Action for EUO, Restart Phase A*, the EUO organization manager, and the nuclear operations manager.

3. Review records to identify subcontractors who supplement the EUO managers in (2).

4. Review records to determine any compensatory measures that have been established for managerial qualifications.

5. Review training records to verify the individuals listed in (2) and (3) meet managerial qualification requirements and compensatory measures.

Interviews:

None

Shift Performance:

Assess managerial awareness and performance of job responsibilities while observing evolutions to determine if they adequately promote and require necessary administrative and safety-basis requirements.

Objectives

CO-35 Training and Qualifications programs for operation support personnel have established, documented, and implemented that cover the range of duties to be perfor

CO-36 Level of knowledge of operations support personnel is adequate based on reviev examinations, exam results, selected interviews, and observation of work practices.

Criteria

1. Area-specific requirements for support organization personnel are established in proced Memorandums of Understanding, or landlord/tenant agreements.

2. Each EUO support organization has documentation demonstrating that their personnel workii EUO facilities meet area-specific requirements.

3. The training and qualification programs of the operations support organizations are consistent the Y-90 series plant procedures.

Approach

Record Review:

1. Review EUO procedures, Memorandums of Understanding, and landlord/tenant agreements to v area-specific requirements for support organization personnel are established in them.

2. Review list of support organization personnel in the positions designated in Table A: Y/MA-7316, *Operational Readiness Review Plan of Action for EUO, Restart Phase A*.

3. Review EUO support organization documentation to verify it demonstrates the personnel in (2) i area-specific requirements.

4. Review area-specific training and qualification programs for support personnel to verify the consistent with the Y10-027, *Plant Training Program*, plant training procedure.

Interviews:

None

Shift Performance:

None

MANAGEMENT (MG)

Objectives

CO-20 Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements and, through their actions, demonstrate a high-priority commitment to comply with these requirements. (CR-14)

CO-29 A program is established to promote a site-wide safety culture. (CR-14)

Criteria

1. Management establishes and communicates a commitment to safety and environmental compliance.

2. Safety problems are reported, prioritized, and tracked in a tracking system.

3. Operations personnel exhibit awareness of, and commitment to, applicable requirements from OSRs, CSRs, environmental permits, radiological work permits, and operating procedures.

Approach

Record Review:

1. Verify the existence of procedures, policies, etc. that promote the identification and promulgation of safety concerns to employees and provide the opportunity for employees to report safety issues.

2. Verify that safety problems are reported, prioritized, tracked, and closed in a timely manner.

Interviews:

Interview senior EUO management to establish management expectations with regard to worker safety and environmental compliance policies.

NOTE: Discussion of these issues is covered in CRADs that address operations and support personnel level of knowledge.

Shift Performance:

None

Objective

CO-24 Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management responsible for control of safety. (CR-11)

Criteria

1. The EUO organization is clearly documented.
2. The EUO organization is known to division personnel.
3. Interfaces with tenant and support organizations are clearly documented.
4. Responsibilities for key operations positions are clearly documented.
5. Operations management is clearly documented as being responsible for safe operation.

Approach

Record Review:

1. Review the documents that define the EUO organization.
2. Review the documents that define the interfaces between EUO and support personnel.
3. Review the documents that define responsibilities for key operations positions.
4. Verify there are documents that define operations management as being responsible for safe operations.

Interviews:

Interview at least three line managers, including front-line supervisors, and three mentors to verify they understand the compensatory measures in place.

Shift Performance:

While observing evolutions, verify that the specified functions, assignments, responsibilities, and reporting relationships are properly implemented.

Objective

CO-25 A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor. (CR-6)

Criteria

1. Formal deficiency identification and handling processes are established.

2. The deficiency identification and handling processes are understood by operations personnel.

3. Health and safety deficiencies are categorized as pre- or post-start.

4. Pre-start deficiencies are corrected or on schedule to be completed before restart.

5. Post-start deficiencies are tracked for closure.

Approach

Record Review:

1. Verify that formal deficiency identification and handling systems exist.

2. Review the list of open findings and corrective actions to determine adequacy of pre- or post-start status and the scheduled completion dates support resumption.

3. Select five findings or corrective actions closed since November 1997 and review the associated files for adequacy of evidence of closure.

4. Verify that post-start findings are being tracked and schedules are realistic and are being met.

Interviews:

1. Interview personnel with open items to determine that items are understood and pre-start findings will be closed prior to restart.

2. Interview personnel to verify they understand how deficiencies are identified, prioritized, tracked, and closed.

Shift Performance:

Field verify the implementation of the five corrective actions selected above.

Objectives

CO-26 A systematic review of the facility's conformance to applicable DOE Orders has been performed. (CR-7)

CO-27 Non-conformances to applicable DOE Orders have been justified, and schedules for gaining compliance have been justified in writing and formally approved. (CR-7)

Criteria

1. Y-12 programs must implement the applicable standards/requirements identification documents (S/RID) in the following functional areas:

   Management Systems
   Quality Assurance
   Configuration Management
   Training and Qualification
   Emergency Management
   Engineering
   Construction
   Operation
   Maintenance
   Radiation Protection
   Fire Protection
   Packaging and Transportation
   Waste Management
   Facility (Nuclear) Safety
   Occupational Safety and Health
   Environmental Protection

2. Corrective actions are being implemented as approved by DOE in Request for Approval (RFA) LMES/Y-12-ORIG-1300.X1A-CSA-130, *Configuration Management on Standards/Requirements Identification Documents*.

3. Non-compliances have been identified and corrected or included in the RFA.

Approach

Record Review:

1. Review a representative sample of the records of compliance reviews for the DOE orders applicable to the functional areas above.

2. For those orders where non-compliances were identified, verify the existence of approved schedules for gaining compliance and compliance with those schedules.

3. Review the RFA to verify it is approved by DOE personnel.

4. Review the RFA to identify needed corrective actions (non-compliances).

Interviews:

1. Interview management personnel to ensure they are aware of the non-compliance(s) and action necessary to fully implement the order requirements, as well as current compensatory measures in the interim.

2. Interview individuals responsible for corrective actions to ensure the corrective actions are on schedule.

Shift Performance:

Observe activities to verify any necessary compensatory measures are in place.

Objective

CO-34 Management programs are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure support services are adequate for operations. (CR-8)

Criteria

1. The management programs identified in Section 5.8 of the OSR are in place.

2. Environmental permit compliance programs are in place.

3. The personnel specified in program documents are assigned as specified.

4. The facilities and equipment specified in program implementing documents are available.

Approach

Record Review:

1. Review the programs identified in Section 5.8 of the OSRs.

2. Review environmental permit compliance programs.

Interviews:

Interview selected personnel described in the programs specified in Section 5.8 of the OSRs to determine that required personnel are assigned.

Shift Performance:

Walk down selected facilities and equipment identified in Section 5.8 of the OSRs to verify they are available.

APPENDIX 2

Team Assignments and Qualification Summaries

TEAM LIST

NAME	AREA(s)
Joe Flynn	Team Manager
Floyd Freeman	Drills (CO-21, CO-22)/ Startup Program (CO-28)
Ron Shaffer*/Joe Flynn	Safety Documentation (COs-1-4)/ Management (CO-20, CO-24, CO-25, CO-26, CO-27, CO-29, and CO-34)
Jim Sprenkle*/Bill Hill	Operations (CO-17, CO-18, and CO-19) /Procedures (CO-7 and CO-9)
Keith Stalnaker*/Terry Betz	Training and Qualification (CO-13, CO-14, CO-16, CO-23, and CO-35, CO-36)
George Zagursky	Modifications (CO-5, CO-6, CO-8, and CO-15)/Surveillances (CO-10, CO-11, and CO-12)
Jim Bazley	Criticality Safety (All COs)

*Lead evaluator for assigned area

TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: Joseph P. Flynn

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

TEAM MANAGER

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S. Electrical Engineering, Purdue University Honors Program
- U.S. Navy Nuclear Power Program - six years
- Commercial Nuclear Plant Experience
  - Engineer
  - Maintenance Manager
  - Senior Reactor Operator
  - Operations Manager
  - Technical Manager
  - Assistant Plant Manager
- Institute of Nuclear Power Operations (INPO)
  - Maintenance Department Assistant Manager
  - Operations Department Manager
    - Developed "Guidelines for the Conduct of Operations at Nuclear Power Stations"
  - Events Analysis Department Manager
  - Technical Development Department Manager
  - Plant and Corporate Evaluation Team Manager - more than 20 evaluations
- Consultant in areas of Operations and Maintenance
- Manager of the LMES Performance Evaluation Group

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- See INPO experience.
- Participated in 13 LMES Performance Evaluation Group evaluations as a consultant to the team manager
- Operational Readiness Review Training, November 1994

SUMMARY OF FACILITY FAMILIARIZATION:

- Led LMES RA for Y-12 Depleted Uranium Operations, Disassembly and Assembly, and Quality Evaluations
- Overview training by Y-12 management

BASIS FOR ACCEPTABLE INDEPENDENCE:

- The Manager, Performance Evaluation Group, reports to the vice president, Defense & Manufacturing.

TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: Floyd E. Freeman

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

DRILLS (DR): Core Objectives 21 and 22
STARTUP PROGRAM (S/U): Core Objective 28

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S., Mechanical Engineering, University of South Carolina
- U.S. Navy Nuclear Power Program - 22 years
- Lockheed Martin Energy Systems (LMES) Performance Evaluation Group - six years

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Certified as LMES Performance Evaluation Group team manager and lead evaluator
- Served as team manager and as lead evaluator that evaluated operations, maintenance, and health and safety areas at LMES facilities
- Operational Readiness Review Training, November 1994

SUMMARY OF FACILITY FAMILIARIZATION:

- Participated in one LMES Performance Evaluation Group evaluation of Y-12
- Overview training by Y-12 Management
- Participated in management self assessment of Y-12 Receipt, Shipment, and Storage, Quality Evaluation, Disassembly and Assembly, and Depleted Uranium Operations

BASIS FOR ACCEPTABLE INDEPENDENCE:

- Normally assigned to the LMES Performance Evaluation Group
- No direct responsibility for Y-12 Nuclear Operations Activities

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: Ronald D. Shaffer

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

MANAGEMENT (MG): Core Objectives 20, 24, 25, 26, 27, 29, and 34
SAFETY DOCUMENTATION (SD): Core Objectives 1, 2, 3, 4

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S., Mechanical Engineering, Ohio State University
- U.S. Navy Nuclear Power Program - eight years
- Commercial Nuclear Plant Experience
  - Engineering
  - Licensing
  - Senior Reactor Operator
  - Operations Advisor
  - Maintenance Manager
  - Startup Engineer
  - Training Manager
  - Consultant to the NRC
- Consultant in the areas of Engineering, Operations, and Maintenance
- Lead Consultant for DOE Headquarters Offices of Nuclear Safety and Environment, Safety, and Health

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Participated in over 40 SSFIs and EDSFIs in commercial nuclear facilities
- Led over 100 integrated assessments at DOE and commercial nuclear facilities
- Member of the Management Subteam on two Tiger Teams
- Subteam leader for DOE HEU Vulnerability Assessment team
- Participated in 10 DOE Headquarters ORR for initial startup and restart of facilities

SUMMARY OF FACILITY FAMILIARIZATION:

- Participated in LMES RA in Y-12 Disassembly & Assembly and Quality Evaluations
- Overview training by Y-12 management

BASIS FOR ACCEPTABLE INDEPENDENCE:

- Has not personally performed any work for the Y-12 facility management responsible for Enriched Uranium Operations.

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: James R. Sprenkle

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

OPERATIONS (OP): Core Objectives 17, 18, and 19
PROCEDURES (PR): Core Objectives 7 and 9

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S., Nuclear Engineering, The Pennsylvania State University
- M.A., Business, Webster University
- U.S. Navy Nuclear Power Program - 20 years
- Lockheed Martin Energy Systems (LMES) Performance Evaluation Group - six years

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Certified as LMES Performance Evaluation Group team manager and lead evaluator
- Served as team manager and as lead evaluator for operations in environmental, safety, and health evaluations of LMES facilities
- Operational Readiness Review training, November 1994

SUMMARY OF FACILITY FAMILIARIZATION:

- Served as team manager for one LMES Performance Evaluation Group evaluation of Y-12
- Overview training by Y-12 management
- Participated in management self-assessment of Y-12 Receipt, Shipment, and Storage, Depleted Uranium Operations, and Disassembly and Assembly
- Participated in LMES RA for Y-12 Quality Evaluations

BASIS FOR ACCEPTABLE INDEPENDENCE:

- Normally assigned to the LMES Performance Evaluation Group
- No direct responsibility for Y-12 Nuclear Operations activities

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: William E. Hill

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

OPERATIONS (OP): Core Objectives 17, 18, and 19
PROCEDURES (PR): Core Objectives 7 and 9

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S., Nuclear Engineering, University of Tennessee
- U.S. Navy Nuclear Power Program - six years
- Participant in LMES evaluations in operations arena since 1991
- Experience
  - Engineer
  - Facility Manager at four ORNL facilities
  - Senior Reactor Operator; 800+ startups; 15,000+ control room hours
  - Writer
    Wrote HFIR Surveillance Test Procedures
    Rewrote TSR-II Technical Specifications
  - MBA alternate for two MBAs

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Qualified as LMES Performance Evaluation Group evaluator; participated in three evaluations
- ORR Team Member for shipment of HFIR fuel utilizing GE-2000 Fuel Cask
- Managed removal of leaking spent fuel from TSF, managed removal of activated beryllium reflector from HFIR pool - both projects underwent successful ORRs and were accomplished without incident

SUMMARY OF FACILITY FAMILIARIZATION:

- Participated in two Y-12 evaluations, one was a training assessment
- Overview training by Y-12 management
- Participated in LMES RA for Y-12 Quality Evaluations

BASIS FOR ACCEPTABLE INDEPENDENCE:

- Normally assigned to Research Reactors Division, ORNL
- No direct responsibility for Y-12 Enriched Uranium Operations

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: C. Keith Stalnaker

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

TRAINING AND QUALIFICATION (TQ): Core Objectives 13, 14, 16, 23, 35, and 36

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S., Engineering, The Ohio State University
- M.B.A., Ohio University
- Lockheed Martin Energy Systems (LMES) Performance Evaluation Group - four years
- Professional engineer registration
- Certified safety professional

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Certified as LMES Performance Evaluation Group team manager and lead evaluator
- Served as team manager and as lead evaluator for health and safety in operations evaluations of LMES facilities
  Operational Readiness Review training, November 1994

SUMMARY OF FACILITY FAMILIARIZATION:

- Participated in one LMES Performance Evaluation Group evaluation of Y-12
- Overview training by Y-12 management
- Participated in management self-assessment of Y-12 Receipt, Shipment, and Storage and Disassembly and Assembly
- Served as team leader for management self-assessment of Y-12 Depleted Uranium Operations
- Participated in LMES RA for Y-12 Quality Evaluations

BASIS FOR ACCEPTABLE INDEPENDENCE:

- Normally assigned to the LMES Performance Evaluation Group
- No direct responsibility for Y-12 Nuclear Operations activities

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: Terry L. Betz

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

TRAINING AND QUALIFICATION (TQ): Core Objectives 13, 14, 16, 23, 35, and 36

SUMMARY OF TECHNICAL QUALIFICATIONS:

- U.S. Navy Nuclear Power Program - six years
- Idaho National Engineering and Environmental Laboratory (INEEL)
  - Support of EH-31 in development of technical training policy, orders, standards,and implementation guidelines
  - Operations and supervision at the Advanced Test Reactor
  - Evaluation and consultant for the Nuclear Regulatory Commission

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Numerous training program assessments at various DOE facilities
- Member of two ORR teams at Rocky Flats

SUMMARY OF FACILITY FAMILIARIZATION:

- Participated in review of the training program in the Y-12 Plant Disassembly and Storage Organization.

BASIS FOR ACCEPTABLE INDEPENDENCE:

- INEEL employee with no involvement in preparing EUO for restart.

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: George P. Zagursky

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

MODIFICATIONS (MD): Core Objectives 5, 6, 8, and 15
SURVEILLANCES (SV): Core Objectives 10, 11, and 12

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S. Nuclear Engineering, Mississippi State University
- M.B.A., University of Miami Executive Program
- Ph.D., Nova Southeastern University
- Commercial Nuclear Experience
  - Start-up Engineer and Hot Functional Coordinator
  - Technical Support Supervisor
  - Design Engineering Mechanical/Nuclear Group Manager
  - Senior Reactor Operator (SRO) trained
- Institute of Nuclear Operations (INPO)
  - Assistant to the Vice President of Analysis & Engineering
  - Technical Support Plant/Corporate Evaluator and Section Head
  - Design Engineering Lead Corporate Evaluator
  - Developed INPO's position on Configuration Management, which was published in document #INPO-87-003
  - Developed the original INPO Design Engineering corporate evaluation performance objectives and criteria
- DOE Experience
  - Senior Consultant in the areas of Management, Operations, Design Change Process, Configuration Management (CM), Training, and Business Process Re-engineering
  - Helped develop various management and technical programs at Y-12, K-25, Pantex, Savannah River, Fernald, et al.
  - Washington team member for DOE-STD-1073-93 on CM

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Participated in 27 INPO plant and corporate evaluations
- As a consultant, lead/participated in over 30 additional NRC/INPO style evaluations, audits, and assessments at various commercial nuclear plants and DOE facilities

SUMMARY OF FACILITY FAMILIARIZATION:

- Participated in LMES RA of Y-12 Disassembly & Assembly
- Overview training by Y-12 management

BASIS FOR ACCEPTABLE INDEPENDENCE:

- LMES subcontractor with no regular interface with Y-12

ACCEPTABLE TO TEAM MANAGER

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TEAM MEMBER QUALIFICATION SUMMARY

TEAM MEMBER NAME: James J. Bazley

TECHNICAL AREA(S)/CORE REQUIREMENTS ASSIGNED:

Criticality Safety Assistance in Several Core Objectives

SUMMARY OF TECHNICAL QUALIFICATIONS:

- B.S., Nuclear Engineering, University of Arizona
- DOE and NRC Nuclear Industry Criticality Safety - thirteen years
  - Knowledgeable of handbook data and the SCALE/KENO computer code
  - Familiar with high enriched uranium fuel fabrication, compound conversions, chemical recovery, laboratory operations, materials packaging, and waste generation and disposal
- Consultant in criticality safety field, member of various ANSI/ANS criticality safety standards writing groups and national workgroups

SUMMARY OF ASSESSMENT/ORR/INSPECTION QUALIFICATIONS:

- Participated in and led numerous appraisal and audits of nuclear facilities at the Idaho National Engineering & Environmental Laboratory and Babcock and Wilcox - Naval Nuclear Fuel Division from a criticality safety and/or nuclear safety perspective
- Management Oversight and Risk Tree Training
- Operational Readiness Review Training, May 1994
- Quality Assurance Audit Techniques, 1992

SUMMARY OF FACILITY FAMILIARIZATION:

- Familiar with similar processes in other DOE and NRC facilities
- EUO orientation

BASIS FOR ACCEPTABLE INDEPENDENCE:

- Has not personally performed any work for Y-12

ACCEPTABLE TO TEAM MANAGER

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APPENDIX 3

ORR Assessment and Deficiency Forms

ORR ASSESSMENT FORM

Functional Area:	Core Objective Number:	Date:

Method of Appraisal (short narrative description):

Personnel contacted/position:

Records & other documents reviewed:

Evolutions/operations witnessed:

Discussion:

Conclusion:

Inspected by:	Approved by:____________________ ORR Team Manager Date:

Form 1

ORR DEFICIENCY FORM

Functional Area:	Core Objective Number:	Date: ID #:

Requirement:

Reference(s) (specific as to section):

Finding_______________ Observation: _______________

Discussion:

Finding Designation: Prestart__________ Poststart__________	Inspector:______________________
Group Leader:____________________ Date:	Approved by:____________________ ORR Team Manager Date:

Form 2

APPENDIX 4

Finding Classification Criteria

Appendix 4: Finding Classification Criteria

This checklist will be used by the ORR team to determine whether a deficiency must be corrected prior to startup.

A. Initial Screening

1. Does this issue involve a safety system?

2. Does this issue involve processes, functions or components identified in the Technical Safety Requirements/Operational Safety Requirements or nuclear safety control procedures?

3. Does this issue involve potential adverse environmental impact exceeding regulatory or site specific release limits?

4. Does this issue impact non-safety processes, functions or components which could adversely impact safety related processes, functions or components?

5. Is this issue non-compliant with a Energy Systems approved startup document?

6. Does this issue indicate a lack of adequate procedures or administrative systems?

7. Does this issue indicate operational or administrative non-compliance with procedures or policy?

8. Has this issue occurred with a frequency that indicates past corrective actions have been lacking or ineffective?

9. Does this issue require operator training not specified in existing facility training requirements?

10. Does the issue involve a previously unknown risk to worker or public safety and health or a previously unknown threat of environmental insult or release.

If the response to any of the above is yes, further evaluation, in accordance with the issue impact criteria below is required. If the response to all of the above is no, the issue may be resolved after restart.

B. Issue Impact

1. Does the loss of operability of the item prevent safe shutdown, or cause the loss of essential monitoring?

2. Does the loss of operability of the item require operator action in less than ten (10) minutes to prevent or mitigate the consequences of events described in the Safety Analysis?

3. Does the loss of operability of the item cause operation outside the TSR/OSRs or Safety Analysis?

4. Does the loss of operability of the item result in a reduction of the margin of safety as described in the Safety Analysis?

5. Does the issue indicate a lack of control which can have a near term impact on the operability or functionality of safety related systems?

6. Does the issue involve a violation or potential violation of worker safety or environmental protection regulatory requirements which poses a significant danger to workers, the public, or of environmental insult or release?

If the response to any of the above questions is yes, the item should be considered a startup item.

APPENDIX B

Assessment Forms (Form 1)

ORR ASSESSMENT FORM

Functional Area: SAFETY DOCUMENTATION (SD)	Core Objective Number: (CO-1, -2, -3, and -4)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Safety documentation has been approved.

2. Safety documentation has been implemented according to approved plans.

3. Structures, systems, and components (SSC) credited for facility safety are identified in Section 2.6 of the Bases for Interim Operations (BIO).

4. Safety limits are discussed in Section 2 of the Operational Safety Requirements (OSR).

Personnel contacted/position:

Facility Safety Engineers
Authorization Basis Manager
Building 9212 Operations Manager
Building 9215 Operations Manager
Mentors
IT&ISS Deputy Chief Engineer
IT&ISS Engineer
Technical Support Engineers
Surveillance Coordinators
NCSO Engineer
NCSO Compliance, Planning, and Resources Group Leader
CSA/CSR Coordinator
Building 9212 Process Engineer
EUO Surveillance Manager
Y-12 Fire Chief
Maintenance Coordinator

Records & other documents reviewed:

Y/MA-7290, *The Basis for Interim Operation for the 9215 Complex Enriched Uranium Operations*

ORR ASSESSMENT FORM

Functional Area: SAFETY DOCUMENTATION (SD)	Core Objective Number: (CO-1, -2, -3, and -4)	Date: April 11, 1998

Y/MA-7254, *The Basis for Interim Operation for Building 9212 Enriched Uranium Operations Complex*
Y/MA-7292, *Preliminary Hazards Analysis for the 9215 Complex Enriched Uranium Operations*
Y/MA-7291, *The Operational Safety Requirements for 9215 Complex Enriched Uranium Operations*
Y/MA-7255, *The Operational Safety Requirements for Building 9212 Enriched Uranium Operations Complex*
CSR-CE/W-016, *Casting Operations (East and West Lines)*
CSR-WVS-025, *West Vacuum System*
Letter from J. Dale Jackson to F. P. Gustavson, dated 11/13/97, *Management Guidelines for Y-12 Operational or Technical Safety Requirement (OSR/TSR) Preparation and Review*
Y10-37-046, *Enriched Uranium Operations Surveillance Program*
Memorandum from Doug Humphrey and Mark Layton to Julia Insalaco, dated 2/14/98, *Draft In-Service Data Sheet Preparation for Surveillance Requirements Required by the IT&ISSP*
CSR-CMH-012, *Containers and Material Handling (U)*
CSR-STOR/E-14, *E-wing Storage* (U)
CSR-NDA-020, *Nondestructive Analysis (NDA) Facility* (U)
CSR-HC-041, *High Capacity Evaporator* (U)
CSR-CP-044, *Chip Drying and Briquetting* (U)
CSR-C-IR&S-048, *C-1 Receiving and Sampling* (U)
CSR-MO-053, *Machining Operations* (U)
CSR-CPK-057, *Chip Packing* (U)
CSR-OW-060, *O-Wing Operations (U)*
Procedure Y70-68-0001, *Criticality Safety Requirements Development, Review, and Approval* (U)
Y/DD-694, *Qualification Program Nuclear Criticality Safety Organization (NCSO)*
Y/DD-587, *Nuclear Criticality Safety Organization List of Qualified Personnel*
ES/CSET-15/R1, *Safety Classification and Special Design Criteria Development Application Guide*
Letter, L. A. Felton to J. Dale Jackson, dated 3/13/98, *Contract DE-AC05-84OR21400, Response to HEPA Proposal (980083)*
Procedure Y53-35-TP-1902, *HEPA System Testing For EUO Safety Significant Ventilation and Filtration System - Stack 3, AFH-2*
WD-EU-9212-012, *CSR-S38-032 Annual Surveillances*
CL-EU-2637-014, *CSA/CSR Surveillance Report*, dated December 4, 1997
RS-EU-9212-010, *E-Wing Chip Processing & Pack/Ship Operator Round Sheet*
Drawing S38-V1, Rev. B.
MJR Y0055478 Task 30, Stack 48 HEPA Filter In-Place Test, Control #92
MJR Y0055072 Task 10, Stack 38 HEPA Filter In-Place Test, Control #338
FO-MOU-001,-Rev. 1, Nov. 1997, *Memorandum of Understanding Between Nuclear Operations and EnrichedUranium Operations with Fire Protection*

ORR ASSESSMENT FORM

Functional Area: SAFETY DOCUMENTATION (SD)	Core Objective Number: (CO-1, -2, -3, and -4)	Date: April 11, 1998

Evolutions/operations witnessed:

See Core Objectives 10, 11, 19, and 25

Discussion:

The safety documentation associated with Buildings 9212 and 9215 was reviewed to determine that the safety envelope was adequately described, the hazards and risks were characterized, and the necessary preventive or mitigative measures to protect the worker, public, and environment were identified.

The Buildings 9212 and 9215 Basis for Interim Operations (BIO) and Operational Safety Requirements (OSR) were reviewed to determine if they were current and approved by the appropriate levels of LMES and DOE management. It was determined that all documents had undergone the correct levels of review and approval. There was an OSR and Criticality Safety Requirements (CSR) implementation plan identified for Buildings 9212 and 9215 and it was current.

Seventeen assumptions used in the Building 9212 BIO Accident Analysis, Chapter 5, were checked to verify that the assumptions were carried through to the BIO Chapter 6, Table 6.1, Operational Controls; and into facility requirements to be implemented. During discussions with the Building 9212 operations manager, it was verified that all 17 assumptions were transferred into OSRs, procedures, the Initial Testing and Inservice Surveillance System (IT&ISS) or, in some cases, operational Standing Orders. Discussions were then held with the authorization basis team manager to determine if all of the 17 assumptions were supposed to be contained in the Building 9212 and 9215 BIO, Table 6.1. It was determined that the process was designed to do that transfer, and Building 9212 facility operators were to implement the Table 6.1 commitments. A review of the 17 selected items was completed and three assumptions did not appear to be contained in Table 6.1. Further discussions were held to determine if this was required. Of the three assumptions not located in Table 6.1, one was determined to be implemented through a Standing Order in the facility and the other two were found not to be part of Phase A1.

Discussions were held with the Enriched Uranium Operations (EUO) Authorization Basis Team and the IT & ISS deputy chief engineer and engineer concerning: the methodology for transferring Building 9212 and 9215 BIO Chapter 5 accident analysis assumptions to Chapter 6, Table 6.1, Operational Controls; the differences in the Building 9215 BIO, Appendix A, and the Preliminary Hazards Analysis listing of dominant scenarios; the methodology and basis for the Building 9212 and 9215 natural phenomena accident analysis documentation and risks associated with not completing the detailed analysis until the DOE Order 5480.23 Safety Analysis Report (SAR) was complete; and Building 9215 accident analysis non-conservative assumptions. These discussions were held to resolve issues that arose during the safety documentation review.

ORR ASSESSMENT FORM

Functional Area: SAFETY DOCUMENTATION (SD)	Core Objective Number: (CO-1, -2, -3, and -4)	Date: April 11, 1998

Discussions were held with the Authorization Basis Team to determine the methodology that was used to identify those assumptions credited in the accident analysis for the Building 9212 and 9215 BIOs and those items transferred to the Operational Controls in Table 6.1. It was determined that not all of the assumptions were identified in Table 6.1. There was no methodology documented in either the Building 9212 or 9215 BIO. The Authorization Basis Team members stated that this process was not documented anywhere; however, the process was accomplished in a controlled manner. This process included reviewing the assumptions and using engineering judgement to determine which assumptions were critical in controlling activities to ensure they were within the safety envelope. (Finding A1-SD-01) A sampling of the dominant scenarios identified in the Building 9215 Preliminary Hazards Analysis (PHA) and those included in Appendix A of the 9215 BIO was conducted. Discrepancies were noted in the area of the postulated criticality events. Discussions were held with the EUO Authorization Basis Team to determine the reasoning used for the BIO Appendix A listings. It was determined that the criticality events were combined into one scenario to address the PHA items. The actual analysis of the criticality accident events were accomplished by the Nuclear Criticality Safety Organization.

The natural phenomena accident analysis sections of the Building 9212 (Section 5.6.6) and 9215 (Section 5.6.7) BIOs were reviewed to determine the effects on the facilities structures, systems, and components. It was determined that no detailed analysis was included in the BIO, and only previously completed analysis was referenced. Discussions were held with the Authorization Basis Team to determine the facilities position on the acceptability of the risks associated with the potential damages to Building 9212 and 9215 as a result of Design Basis Events (DBE). Due to the age of the EUO facilities, DBE criteria had been applied vice Design Basis Accident criteria that would be applied to new facilities. It was determined that there was no compilation of the acceptability of the risks resulting with any known failures that were identified for Building 9212 and 9215. Examples of failures that were noted in the Building 9212 and 9215 BIOs were the east wall of E-Wing collapsing as a result of the DBE earthquake and roof damage and some structural damage occurring as a result of the DBE high wind scenario for Building 9215. As a result of these failures, unmonitored release paths and internal system failures could result in releases larger than those identified in Section 5.6, Accident Analysis. There was no documentation available to support the acceptability of this risk for the time between the BIO implementation and completion of the detailed analysis associated with the SAR efforts for Building 9212 and 9215. (Finding A1-SD-03)

Sample calculations for the worker, co-located worker, and the public were reviewed against the assumptions associated with the accident analysis for the Building 9215 BIO. The two calculations reviewed were 2.01.F.01 and 2.07.F.01 of Appendix B of the BIO. The calculations did not appear to be correct with respect to the co-located workers dose for calculation 2.01.F.01 and for the co-located worker and possibly the public for calculation 2.07.F.01. In both calculations, the committed dose appeared to be calculated lower than actual. During discussions with the Authorization Basis Team, it was determined that incorrect ventilation assumptions had been used and there were corrections being incorporated in the revision to the Building 9215 BIO in the review and approval process. It was also stated there was a revision to the Building 9212 BIO under review. (Finding A1-SD-02)

Two CSRs were reviewed to determine if the active design features were contained in the OSR, Limiting Conditions for Operations (LCO), Surveillance Requirements, and tracked in the IT&ISS. Of the 21 active design features identified in the two CSRs, all were included in the IT&ISS database. The active design features were then traced back to ensure these components were included in the LCOs as required by the J. Dale Jackson to F. P. Gustavson letter dated November 13, 1997. It was determined that the active design requirements concerning E-Wing casting furnace cooling water check valves, contained in CSR-CE/W-016, Section 4.2.2, were not contained in the Building 9212 LCOs. The check valves were, however, mentioned in the Building 9212 BIO, Appendix B, Design Features for Safety. Discussions were conducted with the responsible safety engineer for Building 9212, and it was determined there was a change to how the furnace cooling water check valves were being addressed in a Building 9212 BIO revision currently under review by DOE. (Finding A1-SD-06)

During the review of the Building 9212 IT&ISS CSA/CSR Surveillance Schedule, item number 123 addressed the status of CSR-CE/W-06, cooling water check valve surveillance, as being due November 11, 1998, but the status of the system indicated OOS (out of service). On Tuesday, March 3, 1998, a casting operation was performed utilizing casting furnace C in E-Wing. Discussions were held with the Building 9212 operations manager to determine if the cooling water check valve for furnace C was operational on March 3, 1998. It was stated that the check valve was operational. A review was then conducted of the surveillance package for casting furnace C , and it was determined that valve FTW-FV-406C was bench leak checked by the Facility Management Organization. The actual testing was accomplished November 24, 1997, along with six other valves. The results were used on a go, no-go basis with a criteria of 1.0 standard atmosphere cc/sec with a back pressure of 10 psig. Six of the valves met the acceptance criteria established by the casting restart team manager. The six valves were then reinstalled in the system, one valve on each casting furnace cooling water line (Furnaces A, C, D, G, H, and J).

Discussions were held with the Authorization Basis Team and the IT&ISS engineers to determine if passive design requirements contained in the CSRs were reviewed to determine if the components associated with these requirements were subject to degradation and therefore needed to be included in the IT&ISS database and surveilled by operation, and had all of the components important to safety been included in the BIOs and translated into the OSRs.

During discussions with the Authorization Basis Team and the IT&ISS engineers, it was determined that not all of the passive CSR requirements had undergone a formal review to determine if these features were subject to degradation. It was determined that approximately 70 percent of the CSR passive requirements have undergone the required review by Authorization Team members. Those items that were identified were transferred to the IT&ISS program utilizing a data entry form; however, the items that were excluded did not have any documentation to support the exclusion. This was pointed out to the Authorization Basis Team manager and safety engineers. After discussions were completed with the Authorization Basis Team, discussions were held with the operations manager of Building 9212. It was determined that none of the passive design features that had been identified and documented on the EUO In-Service Surveillance Data Sheets had been reviewed by the operations manager. All of the identified surveillance items must be verified prior to resumption. The methodology for completing the passive design requirement reviews was documented in an internal memorandum to the Authorization Basis Team manager and would be formally required when Procedure Y10-37-046, *Enriched Uranium Operations Surveillance Program*, procedure was implemented. (Finding A1-SD-04)

Authorization Basis Team members were interviewed concerning the identification of safety class (SC) and safety significant (SS) structures, systems, and components in the Building 9212 and 9215 safety documentation. Discussions focused on the safety analysis assumptions associated with HEPA filtration. The HEPA filters were identified in the BIOs as being passive design features and, in at least one case in both Buildings 9212 and 9215, there were SC HEPA filters identified. In no case were there any fans, dampers, hoods, or ductwork identified as being important to safety (SC or SS). The accident analysis credited the HEPA filters and the exhaust path as being the major mitigators in the event of a dominant fire accident scenario. The HEPA filters were not capable of protecting the public without having the designed flows through them. The Authorization Basis Team safety engineers said the fans, dampers, and hood face velocities were required to support the accident analysis assumptions in Section 5.6 of the Building 9212 and 9215 BIOs. The examples discussed were the Stack 38 (Building 9212, chip briquetting fire) and the Stack 3 (Building 9215, chip packing fire) HEPA filter systems. In both cases, it was determined that correct flow from the area of concern; through the dampers and ductwork, to and through the HEPA filters was required to support the accident analysis related to the Stack 38 and Stack 3 accident scenarios. It was further stated that a modification to the BIOs and OSRs had been submitted to DOE for approval. This modification was not reviewed by the ORR team. (Finding A1-SD-05)

Five Criticality Safety Requirements (CSR) were walked down. Results were as follows:

1. CSR-MCS-056, *M Wing Machine Coolant*,

    a. Centrifuges MCS-G-001 and MCS-G-002 were used to remove enriched uranium particles from machine coolant. Beneath each centrifuge inlet and outlet piping connections was a stainless steel drip pan to catch machine coolant leaking from the piping flanges. Machine coolant was standing in the drip pans. CSR-MCS-056 did not discuss these drip pans. The criticality safety engineer who analyzed the information was contacted, and he said he was aware of the drip pans and they were no problem. In a subsequent discussion, the criticality safety engineer responsible for the CSR said he should have listed the drip pans and its associated drawing number in the *Process Description* section of the CSR; but, since there were no criticality safety requirements associated with the drip pans, they did not need to be discussed in the *Criticality Safety Requirements* section. He said he based this decision on the fact that, historically, very little uranium was recovered when the centrifuges were periodically cleaned. He said the centrifuges were cleaned bi-monthly when the tray inventory was accomplished. He included the drip pans as part of the cleaning of the centrifuges. He also said none of his reasoning was documented in the criticality safety evaluation for the CSR. (Finding A1-CS-04)

b. Section 4.7, *Tray Inventory*, of Procedure Y50-37-10-002, *M-Wing Machine Coolant System*, was reviewed. It did not require cleaning of the centrifuges.

c. Section 4.8, *Centrifuge Bowl Cleaning*, was reviewed. It contained a note at the beginning of the section that said to perform this section whenever a tray inventory was performed. However, there was no requirement in this section, or anywhere in Procedure Y50-37-10-002, to clean the drip pans.

d. The Building 9215 operations manager said he would have an approved drawing made for the drip pans. When asked, the criticality safety engineer produced an approved drawing of the drip pans that had been signed by the Building 9215 systems engineer.

e. The Building 9215 operations manager and shift manager both said the administrative boundary, originally set up around the centrifuges when the drip pans were questioned, had been collapsed to just around the drip pans, and administrative controls were in place. A memorandum of conversation, approved by NCSO two days earlier, directed collapsing and rescinding the administrative boundary and returning to normal operation. A walk down of the drip pans revealed no boundary was up, and no administrative controls were in place.

f. Section 5.0, "OPERATIONAL GOOD PRACTICE RECOMMENDATIONS," said the cleaning sink overflow holes should be inspected periodically to verify no obstructions were present. According to the process engineer, this was not being done.

2. CSR-XR-063, *Product Certification*

Section 4.1.2 said the fissile work stations in the two Building 9981 radiography rooms should have locations shown on Drawings 9981-L2 and 9981-L3. A note on Drawings 9981-L2 and 9981-L3 said no fissile work station locations were given on the drawing and they could be located outside of the radiography rooms. The fissile work stations were portable tables.

3. CSR-S38-032, *Stack 38 Exhaust*

One surveillance required system low point drains not upstream of the HEPA filter housing to be periodically inspected to ensure they were free from blockage. Another surveillance required periodic inspection of ductwork and in-line components to ensure additional low points had not been created that could present accumulative point for liquid heights greater than 1.5 inches and that water entry points had not been created. Walkdown document WE-EU-9212-012 combined the nine ductwork sections to be inspected and the two low point drains to be inspected for blockage into one table with the following five columns applicable to all of them and requiring a YES, NO, or N/A (not applicable) to be indicated:

A. Any unauthorized holes or entry points for excessive liquids?

B. Any damaged or broken seals or blank connections?

C. Any damaged or broken seals or blank connection?

D. Any sags or damage creating undrained low points >1.5" depth?

E. Any drains blocked or partially blocked?

Column E applied only to the surveillance to check low point drains free from blockage. Columns A through D applied only to the ductwork inspection surveillance. The last surveillances, conducted November 18, 1997 utilizing walkdown document WD-EU-9212-012, had "NO" filled in under all columns for all ductwork inspections and low point drain inspections.
The latest revision of Stack 38 system drawing S38-V1 showed a half-inch pipe drain off the low point of the fan EF-101 hosing. Only an open threaded boss existed at the low point of the fan housing.

4. CSR-OW-060, *O-Wing Operations*

a. Section 4.3, *Administratively Controlled Limits and Requirements*, required the salt added to O-Wing salt baths be nominally composed of 25% Li_2CO_3, 65% K_2CO_3, and 10% Na_2CO_3 by weight. Procedure Y50-37-20-061, *Adding and Removing Salt from Salt Bath Liners*, required the operator to verify salt composition was nominally 25% Li_2CO_3, 65% K_2CO_3, and 10% Na_2,CO_3 by weight. "Nominally" was not defined in the CSR or Procedure Y50-37-20-061. Data Sheet OW-DS-1 for the O-Wing salt baths stated the composition acceptance criteria as 24-26% LI_2, 64-67% K_2co_3, and 9-11% NA_2CO_3. It also required 99.99% purity, with no trace amounts of barium chloride or sodium cyanide allowed. This data sheet could only be found in the record files for CSR-OW-060, located at NCSO.

b. Two CSA signs were found hanging off the sheet rinse storage tank piping in the Third Mill basement. The CSE stated they were superseded CSA signs.

5. CSR-CE/W-016, *Casing Operations (East and West Lines)*, paragraph 4.3.11, "Infrequent Events," stated that if a failure to pour or a mispour occurs and the residue created would fit into an approved container(s), put the residue in the container(s), weigh the container(s), and introduce the residue into the appropriate process. Abnormal Operating Procedure (AOP) Y56-37-65-012, *Failure to Pour, Mispour*, stated to place the residue in a contain(s), weigh the container(s), place them on an empty lockbox dolly or 4-place packing dolly, and immediately transfer to Break and Shear. The Building 9215 Operations Manager said the residue could sometimes be small enough to be placed directly into storage.

The March 1998 revisions to the following safety documents associated with Buildings 9212 and 9215 were reviewed with the focus being the Phase A1 restart related requirements.

a. Y/MA-7255, Revision 3, *Operational Safety Requirements for Building 9212 Enriched Uranium Operations Complex*

b. Y/MA-7254, Revision 2, *Basis for Interim Operation for Building 9212 Enriched Uranium Operations Complex*

c. Y/MA-7291, Revision 2, *Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations*

d. Y/MA-7290, Revision 1, *Basis for Interim Operation for the 9215 Complex enriched Uranium Operations,*

This review was conducted to determine what changes were incorporated and the impact of these changes on the safety basis for Buildings 9212 and 9215. The main focus of the review was Section 5, *Safety Analysis*, and Section 6, *Operational* Controls, of the BIOs, to establish what changes were made that would affect the LCO requirements for each facility. The overall facility hazard classification, process hazards assessment, and the accident analysis methodology were not altered as a result of these revisions to the safety documentation.

The review of the Accident Analysis for Building 9212 indicated that the resulting consequences from the fires associated with chip handling activities was no longer considered to require Safety Class (SC) SSCs due to sufficient conservatism employed in the analysis. Due to these conservatisms, even though the results were slightly above the threshold for the SC classification, the mitigators were reduced to Safety Significant (SS) classifications. The public receptor in this analysis was over the threshold by a factor of 1.62. As a result of these consequence reevaluations, the Scenario Class was lowered from I to III. These fires, along with the chip burning fires, do rely on the operation of the associated stack HEPA filtration and ventilation systems to ensure that the appropriate mitigation occurs. As a result, the overall classification of the these components was SS SSC.

Additional fires associated with the Phase A1 areas were also addressed in the Building 9212 BIO revision concerning the dry vacuum system and the E-Wing baghouse. In the case of the E-Wing baghouse fire, the noncombustible bags were identified as SC SSCs due to the need to prevent burn through, which was necessary to protect the co-located worker and the public receptors. It was noted that, in the case of the dry vacuum system scenario, the co-located worker was above the threshold for a SC SSC; however, the use of conservatism in the analysis was again credited for the high number and the filtration and ventilation and was, therefore, not identified as a SC SSC. The dose in this case was 1.76 times the threshold.

The last fire consequence area reviewed for change was the building fire in Building 9212. This section (Section 5.6.1.5) had been modified to remove the necessity for the E-Wing basement fire patrol due to the removal of the combustible material that was previously identified to be a problem. Further, a program to maintain fire loading below design was identified as the necessary mitigator.

The consequence calculations in Building 9212 BIO Appendix B, *Radiological Consequence Calculations*, were reviewed to determine if these calculations supported the results discussed in Section 5. The dominate scenario was the chip cleaning fire (number 4.01.F.02). This was consistent with the Safety Analysis section as reviewed above. The analysis results appeared to be conservative; however, the recalculations that identified which conservative factors were chosen to support reclassification of the scenario was not readily apparent.

A meeting was held with the Authorization Basis Team to discuss the consequence calculations contained in Appendix B of the 9212 BIO. The manager of the group said the purpose of these calculations was to be conservative in their approach; however, two of the ten calculations lead to above allowable unmitigated doses to the general public. When questioned as to why the mitigative systems were not classified SC, it was stated by the group manager that ES/CSET-15/R1 allowed for the lower classification if the values were "close to the requirement." No guidance as to how close the number needed to be was given (e.g., ±10%). It was further stated that a qualitative review of the calculations was conducted, and the results were transmitted to DOE via the referenced L. A. Felton to J. Dale Jackson letter, dated March 13, 1998. No quantitative calculations were completed to support the de-classification of the HEPA filters and associated ventilation systems. The only calculations contained in the Building 9212 BIO show above allowable doses to the public. (Finding A1-SD-07)

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The revised OSRs for Building 9212 were reviewed to determine the adequacy of the changes in support of the modifications to the BIO. The current OSRs had a major change to address the HEPA filters associated with Building 9212 Stacks 27, 38, and 48. The revision addressed the differential pressure across each of the associated HEPA filters and ensured that the ventilation system was operating. The surveillances associated with each stack only verified the functionality of the HEPA filter and the differential pressure across the filter. There was no verification of velocities in the hoods or other areas of concern associated with any of the stack ventilation systems. It was assumed that without these flows being adequate, an unfiltered exhaust path through general room ventilation could occur. Further, maintaining the differential pressure and not requiring the ventilation system to be maintained (e.g., other damper positions and specific fan combinations) could result in out-of-design flows in portions of the ventilation system, even with the differential pressure across the HEPA filters within acceptance criteria. Although it may have been implied that the associated stacks ventilation system must be operable, there were no surveillances to ensure operability over time. (Finding A1-SD-05)

Changes associated with the Building 9215 BIO and OSR were reviewed. This review concluded that the Stack 3 HEPA filters and the associated ventilation system were identified as SS1 SSCs with respect to the chip packing fire, process machine chip fire, coolant system filter fire, and accountable vacuum system trap fire scenarios in Section 5 of the Building 9215 BIO. The major factor associated with these accident scenarios was filtration to reduce risk. A review of the OSR associated with the Stack 3 HEPA and associated ventilation system indicated the LCOs and surveillance requirements were the same as those that were identified for Stacks 27, 38, and 48 in Building 9212. This lead to the same concern that the actual parameter that needed to be controlled, the velocities at the point of the accident, were not actually monitored for operability. All of the areas of concern previously identified for Stack 3 could cause interaction with each other should any dampers be manipulated. (Finding A1-SD-05) Further, the surveillance requirements did not specify which dampers or HEPA filters were actually required to be operable or surveilled. No unique identifiers were assigned in the OSRs. The only reference was "each combined prefilter-HEPA filter..." or "a combined prefilter-HEPA filter unit differential pressure instrument." No listing of the actual instruments, filters, differential pressure gauges, etc. was contained in the LCO or surveillance section of OSR 3/4.3.1. The individual instruments and HEPA filters for Stacks 3, 27, 38, and 48 were listed in the Bases section of the OSRs for Buildings 9212 and 9215. The only discrepancy between the Bases section and the actual filter nomenclature identified in the surveillance program was that the actual HEPA filters were found to be in a two filter per bank configuration (e.g., 2A1-A, 2A1-B).

Discussions were held with Authorization Basis Team personnel concerning the revised LCOs and BIOs associated with the Buildings 9212 and 9215 ventilation systems. These discussions centered on Stacks 27, 38, and 48 in Building 9212 and Stack 3 in Building 9215. The revision included monitoring differential pressures across associated HEPA filters and maintaining a required parameter (i.e., 0.5 to 5 inch of water column). There was no requirement to maintain the correct velocities at the point of incident. It was stated that the facility had a hood surveillance program that was in the process of being implemented to deal with point of incident flow. This program was not an LCO requirement nor was there any requirement to reverify flows should any change to damper positions be made. These changes would affect overall systems flows. The normal method to maintain HEPA differential pressure was to modulate the damper associated with the filter bank. (Finding A1-SD-05)

The Stack 3 HEPA filter surveillance procedure that was completed March 20, 1998, was reviewed. The surveillance was accomplished to meet the OSR LCO requirement in the revised OSR for Building 9215. The surveillance procedure was completed satisfactorily, and the documentation was satisfactory, with one minor exception. Appendix A required all test team participants to be listed, including name, badge number, and initials. According tot he test documentation, one individual was identified that was not listed on Attachment A. This was pointed out to facility management.

The last completed OSR surveillance test for Building 9212, Stack 38 was reviewed. The test was completed unsatisfactorily on February 17, 1998. The cause of the unsatisfactory results was numerous unacceptable conditions noted on the equipment inspection walkdown portion of the surveillance. The actual HEPA efficiency test met the acceptance criteria and Appendix A, HEPA System Information Worksheet, indicated the surveillance passed. It was later determined by the Building 9212 operations manager that, though the HEPA met the environmental permitting requirements, it did not meet the OSR requirement. At that point, all chip handling activities associated with Stack 38 were suspended and the HEPA filter repair and caulking activities were commenced. Upon completion of the modifications, the surveillance will be run again. Minor issues associated with the surveillance test package were covered with the Building 9212 operations manager. The items of concern were as follows:

a. Not all the unacceptable conditions noted during the inspection were identified in Appendix C, Deficient Conditions.

b. Appendix D, System Line-up, was not a complete list of all the dampers and electrical switches.

c. The facility participants in the surveillance test were not listed in Section 6.2[1] of the test procedure.

The last completed OSR surveillance test for Building 9212, Stack 48 was reviewed. The test was signed off as being satisfactory. As discussed above, there were numerous unacceptable conditions noted on the equipment condition walkdown; however, the surveillance was identified as being satisfactory to meet the OSR requirement. A review of the status board in the shift manager's office in Building 9212 indicated the Stack 48 ventilation system was in standby. This was discussed with the Building 9212 operations manager, it was determined that the surveillance had been re-run in the past two days, and the package was in the review cycle. Some minor deficiencies were discussed with the Building 9212 operations manager. The items of concern were the same as the Stack 38 procedure listed previously, and it was noted the test was started and stopped due to excessive airflow in the system; however, no

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record of the out-of-specification value was listed in Appendix A, HEPA System Information Worksheet. The out-of-tolerance value was described in the test log in Appendix G.
NCSO personnel were interviewed concerning the various software and hardware interlocks associated with the Building 9215, O-Wing Billet Processing Facility. The design and operations of this processing activity employed numerous remote handling and automated activities. The discussion centered around whether any of this automation needed to be covered either in the safety documentation or the criticality safety requirements (CSR). It was determined that the critical points in the operation (e.g., movement into salt baths, movement into annealing ovens, etc.) required a positive operator action prior to the actual operation. Further, the existing CSR considered an array made up of two billets stacked on top of each other. This condition did not cause an unacceptable K_{eff}. The operations associated with this activity were observed by team members, and it was determined that the automated system was under the control of the operator in a phased condition. As a result of this, it was determined that the current safety documentation was adequate.

Reviewed the compensatory measures for the Building 9212 complex. Selected ten posting requirements for the building to determine that the postings were in place and the correct shift manager's posting numbers were on the posting. In all cases, the signage met the compensatory measure requirement and were correctly numbered. Further, the areas requiring flashlights for entry and areas where supplemental personal alarming radiation monitoring is mandated were listed on the cover page of the Plan of the Day for Building 9212. An earlier review verified that the OSR/BIO required fire patrols were being accomplished in accordance with the operations manager's standing orders. Interviewed the Building 9212 maintenance coordinator to determine how the compensatory measures associated with hot work permit fire protection engineering reviews were accomplished. It was determined that although there was no procedural requirement, all work orders were reviewed, and all hot work permits that were to be utilized in the areas of the facility associated with the compensatory measure list were forwarded to fire protection engineering for review. Two examples were reviewed and found to contain the review and the established requirements were appended to the work order.

Reviewed the Building 9212 and Building 9215 BIOs and OSRs associated with minimum shift compliment. The results identified that there was a requirement to maintain a minimum of eight on-shift emergency response personnel on a 24-hour a day basis. This requirement was added to the safety documentation in the latest (March 1998) revision. The only relief from the eight on-shift personnel was when response to a medical emergency or mutual aid request was made, and then there was a 90-minute window established during which no minimum was specified. It was also determined that no guidance existed as to the actions to be taken to protect the facility should this administrative requirement not be met. The only requirement was to report the condition to DOE. The Building 9215 operations manager was interviewed to discuss this situation, and it was confirmed that he had no new MOU or guidance as to what actions would be taken. Further discussions were held to determine the notification process for Buildings 9212 and 9215 facility management should the emergency response organization personnel drop below eight and the 90-minute clock begins. It was not determined that formal notification protocol existed. (Finding A1-SD-08)

Discussions were held with the Y-12 fire chief to determine what the normal shift compliment was for emergency response personnel. The off-shift staffing level (between 1530 and 0700 daily and on weekends) was eight. When asked about the possibility that the level would fall below eight, it was stated that it occurred routinely, and that greater than 50 percent of the emergency response activities last year were medical related. Of these medical responses, may required transport to a hospital off site, which would start the 90-minute clock. The nominal turn around time of the ambulance was less than one hour; however, it would exceed 90 minutes should anything off-normal occur while off site. At the time of the medical transfer off site, the normal shift compliment would be six.

A meeting was held with representatives of the Authorization Basis Team and the fire department. During this meeting, it was determined that there was no clear communication from the fire department to the Building 9212 and Building 9215 facility management group concerning the minimum shift complement requirement or when this requirement was not met and the 90-minute clock had been started. Further, there were no required actions in place to address what actions should be taken if there was less than eight emergency response personnel available after the 90-minute grace period expired. (Finding A1-SD-08)

Conclusion:

Although the current safety documentation has been approved and the current revision (March 1998) is in the process of being implemented, the structures, systems and components necessary to support the safe operations of the facility are not adequately addressed. Further, there are cases where a non-conservative, qualitative interpretation of calculations relating to postulated unmitigated accident doses to the public were used with no recalculation to quantitatively support the results. Based on the current status of the safety documentation, the criteria of this functional area cannot be met without the significant corrections necessary to address the pre-start findings identified during the ORR.

Inspected by: R. D. Shaffer	Approved by: [signature] ORR Team Manager Date: 4/14/98

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Functional Area: CRITICALITY SAFETY (CS)	Core Objective Number: (COs 1-4)	Date: April 14, 1998

Method of Appraisal:

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

Personnel contacted/position:

NCSO Manager
NCSO Engineers
NCSO Compliance, Planning, and Resources Group Leader
NCSO Enriched Uranium Operations Resumption Group Leader
NCSO Enriched Uranium, Waste Management, Analytical Services Organizations Group Leader
CSA/CSR Coordinator, Building 9212 Surveillance Coordinator
Shift Administrative Assistant for Building 9215/9998 Operations, Building 9215 Surveillance Coordinator
Shift Technical Advisors for Building 9215/9998 Operations
Shift Manager for Building 9215/9998 Operations
Document Control/Records Management Personnel
Process System Engineer for HVAC for Building 9212
EUO Procedures Manager
Metal Production Procedures Lead
Shift Technical Advisor for Building 9212 Operations

Records & other documents reviewed:

CSE-SOW-064, *O-Wing Ventilation (U)*
CSE-OW-060, *Criticality Safety Evaluation for O-Wing Operations (U)*
CSE-OW-060, *Criticality Safety Evaluation for O-Wing Operations* Addendum 1
CSE-CMH-012, *Criticality Safety Evaluation for Containers and Material Handling (U)*
CSE-CE/W-016, *Criticality Safety Evaluation for East and West Lines Casting*
CSE-MO-053, *Criticality Safety Evaluation for Machining Operations*
CSE-S38-032, *Criticality Safety Evaluation for Stack 38 Exhaust System*
CSE-S48-033, *Criticality Safety Evaluation for Stack 48 Exhaust System*
CSR-CMH-012, *Containers and Material Handling (U)*
CSR-OW-060, *O-Wing Operations (U)*
CSR Implementation and Authorization Checklist for CSR-OW-060
CSR Implementation and Authorization Checklist for CSR-OW-060, Rev. 1
CSR Implementation and Authorization Checklist for CSR-SOW-064

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CSR-CE/W-016, *Casting Operations (East and West Lines)*
CSR-MO-053, *Machining Operations*
CSR-CMH-012, *Containers and Material Handling (U)*
CSR-STOR/E-14, *E-Wing Storage*
CSR-NDA-020, *Nondestructive Analysis (NDA) Facility*
CSR-HC-041, *High Capacity Evaporator*
CSR-CP-044, *Chip Drying and Briquetting*
CSR-C-IR&S-048, *C-1 Receiving and Sampling*
CSR-CPK-057, *Chip Packing System*
CSR-S38-032, *Stack 38 Exhaust*
CSR-S48-033, *Stack 48 Exhaust*
Procedure Y70-68-003, *Nuclear Criticality Safety Incidents, Deficiencies, and Procedural Noncompliances (U)*
Procedure Y70-37-103, *Containers and Material Handling (U)*
Procedure Y70-68-007, *Review of Documents Controlling Fissile Material Activities*
Procedure Y50-37-20-002, *Billet Salt Bath Operation*
Procedure Y50-37-20-003, *Rolling Mill Operation*
Procedure 50-37-20-020, *Ajax Salt Annealing and Washing System (Jack Rabbit Conveyor)*
Procedure Y50-37-20-055, *Operation of the Gantry Control System*
Procedure Y50-37-20-061, *Adding and Removing Salt from Salt Bath Liners*
Procedure Y50-37-20-062, *Salt Bath Startup*
Procedure Y50-37-20-104, *Manual Operation of the Gantry* (U)
Procedure Y70-68-0001, *Criticality Safety Requirements Development, Review, and Approval*
Procedure Y70-37-102, *Validation and Implementation of Criticality Safety Requirements*
Procedure Y50-37-20-058, *O-Wing Bag Filter Changeout*
Y/MA-7290, *The Basis for Interim Operation for the 9215 Complex Enriched Uranium Operations*
Y/OD-724, *NCS Guidance for STAs*
Y/DD-694, *Qualification Program Nuclear Criticality Safety Organization (NCSO)*
Y/DD-587, *Nuclear Criticality Safety Organization List of Qualified Personnel*
NCSO Deficiency Summary Report 02/03/98
PNC-54-98, applying to CSR-STOR/E-014 and PD-EUO-9212-STOR/E
Y/MS-7292, *Preliminary Hazard Analysis for 9215 Complex Enriched Uranium Operations*
Building 9215 Phase A1 CSRs, informal list from the shift technical advisor for Building 9215/9998
Building 9212 Phase A1 CSRs, informal list from Building 9212
Summary of EUO Deficiency and PNC Reports for the period of 12/1/97 to 2/26/98
L. A. Felton letter to Distribution, *Evaluations of Procedure and Job Performance Aid (JPA) Discrepancies*, December 16, 1997
DWG #OW-D1, *O-Wing General Equipment Scrap Pan Storage Rack Equipment Details*
DWG # OW-D3, *O-Wing General Equipment Enclosed Storage Rack Equipment Details*

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DWG #SRS-D2, *O-Wing Sheet Rinse Sys Tanks 603A and 603B Equipment Details*
DWG #SRS-D5, *O-Wing Sheet Rinse Sys Stor Tnks F-600-A thru H Equipment Details*
DWG #O-L3, *O-Wing East End Equipment Plan*
DWG #BSB-D3, *O-Wing Billet Salt Bath Basket Equipment Details*
Data Sheet #OW-DS-1, *Salt Chemical Composition*
CSA/CSR Cancellation Form for CSR-VPD-007
CSR-VPD-007, *E-Wing Inventory and Verification Process*
DEF-126-96, applying to CSA QC-1
DEF-131-96, applying to CSA C1-70 (now CSR-STOR-C-037 and CSR-CMH-012)
DEF-071-97, applying to CSR-CMH-012
DEF-102-97, applying to CSR-CMH-012, Y/MA-7270
DEF-007-98, applying to CSR-CMH-012, Y/MA-7270 and Y70-37-103
PNC-53-96, applying to CSA C102 (now CSR-STOR-C-037 and CSR-CMH-012)
PNC-16-98, applying to Y70-150
CSA-9104, *Salt Bath Criticality Factors*
RFP-89, *Sub-Critical Measurement on Parallelpipeds Containing U-235 and Salt Eutectic*
CSR Implementation and Authorization Checklist for CSR-STOR/E-014
CSR Implementation and Authorization Checklist for CSR-CMH-012
Deficiency Report #92159800047, applying no HEV processing per CSR-SOW-064
History file for Procedure Y50-37-20-002
Procedure 50-37-20-005, *Sheet Annealing Ops*
Procedure Y10-103, *Writer's Guide for Y-12 Plant Technical Procedures*
Change Directive #Y10-103-01
CSR-STOR-C-037, *Chemical Area Storage*
Procedure Y50-37-10-015, *Centerless Grinder Coolant System*
NCSO Operations Support SME List for EUO PBR Activities
CSR Implementation and Authorization Checklist for CSR-MO-053
CSR Implementation and Authorization Checklist for CSR-STOR-C-037

Evolutions/operations witnessed:

No evolutions were attended. Particular equipment and processes were walked down to verify aspects of CSR and procedural controls as discussed below.

Discussion:

The criticality safety functional area has no core objectives specifically associated with it. Y/MA-7316, *Operational Readiness Review (ORR) Plan of Action for Enriched Uranium Operations (EUO) Restart*

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Phase A, assigns all the core objectives to criticality safety on a secondary support basis. Therefore, the criticality safety functional area was evaluated against the requirements established in Y/MA-7332, *LMES ORR Implementation Plan for EUO Restart Phase A1 at the Oak Ridge Y-12 Plant*, which established a performance based assessment of those activities designated to restart as part of Phase A1. The focus of the functional area review was on operational aspects of criticality safety. Non-operations specific aspects of criticality safety were not reviewed unless problems where found in the implementation of criticality safety at the shop floor level and only then were programmatic aspects of criticality safety reviewed.

The review was conducted by examining Criticality Safety Requirements (CSR) against operating procedures and field conditions. Criticality Safety Evaluations (CSE) were reviewed to determine basis and adequacy of CSR requirements implemented on the shop floor. This review only attempted to determine the adequacy of floor level criticality safety.

A Brief Description of the Criticality Safety Program. Criticality safety was implemented in EUO operations through the use of CSRs. These documents identified the passive and active design features and administrative requirements that are important to criticality safety. The requirements contained in CSRs were implemented in operational systems by flowing down administrative requirements into procedures and surveillance documentation and controlling passive and active design features by identifying important parameters to criticality safety in drawings and other systems. This was accomplished by a validation and implementation process implemented by Procedure Y70-37-102. The process involved the establishment of an operations implementation team that identifies specific field changes (i.e., fabrication, replacement, or modification of signs, containers, and equipment), documentation changes (such as to procedures, round sheets, and surveillance matrices), safety reviews, and development of training modules necessary to implement the CSR and the generation of a one-to-one matrix list of CSR requirements to implementing documentation documents. All of this constituted the CSR Implementation and Authorization Checklist (Checklist) and associated implementation plan. The process closely involved operations, procedures, process engineering, and the Nuclear Criticality Safety Organization (NCSO).

CSRs were generated from CSEs. The CSEs defined the scope of operations controlled within CSRs, determined the upset conditions that can affect criticality safety, evaluated the state of criticality under these upset conditions, and assured double contingency by establishing requirements that must be followed to satisfy the double contingency principle. The double contingency principle requires that sufficient factors of safety be established such that two unlikely, independent, and concurrent changes in process conditions must occur before a criticality safety accident is possible.

General Conditions of the Operational Criticality Safety Program. Overall, the criticality safety program had some major strengths. CSR requirements were clearly and consistently identified in procedures and drawings. Operations personnel were aware of, and dutifully, followed CSR requirements and administrative controls. When potential criticality safety problems were identified, appropriate actions were taken to stop operations and adequately address those problems. The criticality safety staff had a good relationship with operations and the engineers had a good floor level presence. The NCSO staff were well versed in operations and had a good operational understanding of criticality safety.

The following more detailed observations were made:

O-Wing CSR Observations. CSR-OW-060, CSR-SOW-064, and CSR-CMH-012 were identified by operations and Nuclear Criticality Safety Organization (NCSO) personnel as covering O-Wing operations. CSR Implementation and Authorization Checklists for CSR-OW-060 and CSR-SOW-064 were reviewed to identify CSR requirements and ensure they were incorporated into the procedures and drawings. CSE-OW-060, CSE-SOW-064, and associated procedures, drawings, and data sheets were also reviewed to see if requirements were consistent from the CSE to the CSR to the CSR Implementation and Authorization Checklists to the procedures, drawings, or data sheets. The results of these reviews were as follows:

a. CSE/CSR-SOW-064 covered the ventilation system for O-Wing. A review of CSE/CSR-SOW-064 identified that the CSE/CSR did not address enriched uranium operations in O-Wing. It assumed that operations in O-Wing would only use depleted uranium. This was clearly identified in the introduction section of the CSE and the process description section of the CSR. (The last sentence in the process description section of CSR-SOW-064 stated: "It is also understood that a revision to this CSR will be initiated by a change request before the O-Wing Ventilation system is used for enriched uranium.") The CSR requirements, though, did not clearly identify this. No procedures restricted operation to the use of depleted uranium. This condition was also contrary to the declaration that operations were ready to proceed and that depleted uranium was being handled as if it were enriched uranium. (Finding A1-CS-02)

b. CSR-OW-060 covered the operations in O-Wing. A review of CSE-OW-060 was conducted to identify particular process upsets and associated CSR requirements to verify in the field. The description section of the CSE contained no detail other than a list of procedures, drawings, and data sheets associated with O-Wing operations. This did not (1) clearly define the scope of operations, operating constraints, and applicability of the CSE (this could not be defined in any other section or the CSE) or (2) provide sufficient detail to determine failure mechanisms and failure probabilities associated with contingency analysis. Documentation issues were discussed with NCSO engineer authors and reviewers of CSE-OW-060 concerning process description, contingency identification and analysis, and disposition of analysis. Documentation in CSE-OW-060 makes confirmation of particular CSR requirements difficult and the determination of the criticality safety of O-Wing operations uncertain without extensive review. The Building 9215 BIO was reviewed to obtain descriptive information to determine the scope, boundaries, process equipment, and flow of O-Wing operations. This was done to obtain sufficient knowledge to perform a review of the main O-Wing CSE (CSE-OW-060). The CSE did not contain sufficient detail and discussion to determine the normal and upset conditions that may challenge criticality safety. The demonstration of the sufficiency of the CSR requirements in satisfying double contingency was contained within the minds of the analysts and reviewers. Due to the lack of documentation on process operations and scope, along with the minimal contingency analysis, every change to the O-Wing process must be completely reviewed and the safety of operations redetermined. Of primary concern, was the fact that this was all based upon the knowledge of the analysts and reviewers and sufficient rigor (through use of a systematic documented process such as "what if", HAZard and OPerational analysis [HAZOP], or event tree analysis) was not applied to confirm that particular aspects of criticality safety were not overlooked.

c. Two CSR Implementation and Authorization Checklists (Checklists) for CSR-OW-060 were on file with the CSA/CSR coordinator. One was for the original issue of the CSR. The other was for the first revision to the CSR, which addressed only the changes to the CSR. The Checklists were generated as part of the CSR validation and implementation process as controlled by Procedure Y70-27-102. The procedure required the identification and confirmation that CSR requirements were incorporated into procedures and documents. The incorporation of the CSR requirements in the associated procedures and documents was reviewed to determine the effectiveness of the CSR implementation program. Procedures Y50-37-20-002, Y50-37-20-003, 50-37-20-020, Y50-37-20-055, Y50-37-20-061, Y50-37-20-062, and Y50-37-20-104 were reviewed and found to have minor deficiencies. Procedure Y50-37-20-202, which was identified on the Checklist as containing several CSR-OW-060 requirements, was not found in the Document Management Center. Instead, the controlled document was Procedure 50-37-20-202 (dated 8/3/88). Procedure 50-37-20-020 was under administrative hold pending its revision, but revision of other associated O-Wing procedures made Procedure 50-37-20-020 unnecessary, because the revised procedures addressed the operations previously controlled by Procedure 50-37-20-020. So, although the Checklist identified Procedure Y50-37-20-020 as containing several CSR-OW-060 requirements, those requirements were incorporated into other procedures and Procedure Y50-37-20-020 was never issued.

As discussed in the ORR Assessment Form for Core Objective 7, the implementation of CSR-OW-060 requirements into procedure did not match the CSR Implementation and Authorization Checklist for CSR-OW-060. Several CSR requirements were either not found in the procedures they were identified as being implemented in or CSR requirements were found in procedures that were not identified on the checklist. The authors of the CSE/CSR-OW-060 said some of the CSR requirements that were identified by the checklist as being in the procedures, but were not found with CSR identifiers in the procedure, were either in several different steps or were implemented due to operational constraints that were not procedural step specific. The EUO procedures manager was contacted to determine the CSR identification criteria. Procedure Y10-103 (along with the associated change directives) provided criteria for identifying requirements in the "Precautions and Limitations," "Source Requirements," and "Action Steps" sections of operational procedures, but it did not provide direction on how to identify multiple step or non-specific step operating constraints that implement CSR requirements.

The number of deficiencies found in the incorporation of CSR-OW-060 requirements (as found in the Procedures Functional Area CO-17 ORR Assessment Form) and the identification of a non-existing procedure as containing CSR requirements by the Checklist showed weaknesses in the CSR validation and implementation process.

d. The normal and contingency analysis sections were reviewed to determine bounds and constraints on the requirements of CSR-OW-060. One CSR requirement specified that the salt composition for the salt bath must be "nominally 25% Li_2CO_3, 65% K_2CO_3, and 10% Na_2CO_3 by weight." No constraint was given for nominal. Analysis in the CSE showed that a minimum ~45 wt.% K_2CO_3 was required for the reactivity of parts in the salt bath to be within acceptable limits. (Full water reflection conditions in supporting analysis used to justify the safety of normal conditions required that the K_{eff} of a part in the salt bath must be equivalent or less than the K_{eff} with full water reflection.) O-Wing Procedures Y50-37-20-002, Y50-37-20-061, and Y50-37-20-062 also did not specify acceptable tolerances for the "nominal" salt bath composition.

Data sheet OW-DS-1 was obtained to determine the specifications for salt composition used in the O-Wing salt baths. It specifically called out a composition of 24-26% Li_2CO_3, 64-67% K_2CO_3, and 9-11% NA_2CO_3, vs the 25% Li_sCO_3, 65% K_2CO_3, and 10% Na_sCO_3 nominal values called out in the CSR. Therefore, the data sheet provided adequate specification and bounds for salt composition such that the assumptions made in the criticality safety evaluation were maintained. Despite this, the CSE and CSR should clearly specify the acceptable range of salt compositions, not "nominal" values to be reevaluated at a later date as salt compositions change (due to supplier or process change).

e. CSE-OW-060 evaluated uranium oxide accumulation in the salt baths due to uranium metal billet and plate heating. Two short paragraph discussions in two separate sections provided justification as to why the accumulation of uranium oxide after several salt bath heatings was bounded in the analyses used to demonstrate criticality safety. The first showed that an accumulation 3.5 kg uranium (from oxide formation in salt) was safe for the billet/plate masses controlled by the CSR. The second section looked at an array of accumulation (such as in liners, pans, and salt in dollies and drums) and showed that individual accumulations of 5.8 kg uranium were safe. These sections were assumed to justify the following two CSR requirements. "Salt bath sludge pans shall not exceed a total accumulation of 1500 grams of uranium oxide" and "Salt bath inner liners shall not exceed a total throughput of 10000 grams of uranium oxide." These limits were contained in CSR-OW-060 and incorporated into Procedures Y50-37-20-002, Y50-37-20-055, and Y50-37-20-014. No basis or rationale was provided in the CSE to justify why the 10,000 throughout limit was safe compared to the 3.5 kg mass justified. (Finding A1-CS-03).

f. CSR-OW-060 restricted the amount of uranium oxide allowed to accumulate in the salt baths. Specifically, oxide accumulation in the salt bath sludge pans and inner liners were restricted to 1500 and 10,000 grams, respectively. The CSE stated that formation of oxide was about 10 grams per billet or plate heating and referenced CSA-9104 as the source of the 10 gram amount. Procedure Y50-37-20-002 required that a value of 10 grams be used as the oxide accumulation value for each billet processed through a bath, 20 grams for the first reheat of a rolled sheet, and 30 grams for the second reheating of a rolled sheet. The Metal Production procedures lead was contacted to determine the origin and basis of the 10, 20, and 30 gram oxide quantities in the procedure. The author of the procedure was no longer working at Y-12. A search of the history file for Procedure Y50-37-20-002 indicated that the gram values were in the original 1996 draft. Further searching of an older 1994 draft version of the procedure also contained the gram quantities, but a still older version of the procedure could not be found. A similar Procedure 50-37-20-005 (dated July 19, 1988) for plate annealing was found. It did not contain exact gram quantity values, but specified that "A certain number of grams will be added for each part processed (in a salt bath)... according to surface area of the part" with reference to the old CSA manual for determining the certain mass. From talking to NCSO personnel, it was confirmed that CSA-9104 provided gram values used in the procedure. (CSA-9104 was referenced in the CSE as the source of gram quantity uranium oxide accumulation due to the heating of billets and plates.) CSA-9104 provided gram limits based on the surface area of a billet or plate. The gram quantity values in the procedures were evidently established for the bounding billets and plates being processed, knowing that particular billets and plates at different stages of processing had different surface areas, although no documentation could be found to substantiate this.

The uranium oxide accumulation rate for uranium metal in salt baths was probably a function of the salt composition, temperature, and billet/plate heating time, as well as the surface area of the billets and plates (exposed to the salt). Therefore, the basis for the uranium oxide accumulation quantities was required to determine if the current process was bounded by the evaluated conditions assumed in CSE-9104. CSA-9104 was a one-page, two-sided document providing several different values for oxide accumulation to be used for different billet or plate surface areas. Ten grams of oxide accumulation was the lowest value on the list, with some values much larger. CSA-9104 referenced an E. E. Johnson letter as the basis for the uranium oxide accumulation factors. This letter was not found and was determined to be unlocateable. Hence, the validity and bounding nature of the oxide accumulation factors could not be confirmed. Therefore, no existing document provided the basis for uranium oxide formation and accumulation in the salt bath. Because no basis existed, it could not be confirmed that uranium oxide would accumulate at a rate equal to or less than the gram values used in the procedure. Therefore, no documentation existed to adequately provide the basis as to why the CSR limits on sludge pans and inner liner (1,500 grams and 10,000 grams oxide, respectively) are met. (Finding A1-CS-01)

The authors of the CSE/CSR said Appendix C to the CSE provided data to back up the missing basis for the uranium oxide accumulation gram values. The data in Appendix C was handwritten accountability and uranium recovery data from the 1988 and 1989 time frame. There was no traceability for this data either, and the data did not clearly substantiate the uranium oxide gram quantities used in the procedures to assure the CSR limits. Therefore, no existing document provided the basis for adequate and correct implementation of the CSR salt bath uranium accumulation limits.

g. CSEs must document bases for assumptions made that were used to justify the criticality safety of the system. Additionally, clear ties should be made from the continency discussion to CSR requirements (or assumptions) that must be verified as part of the validation and implementation process. CSE-OW-060 was reviewed and found to be missing many of these bases and ties. For example, under the "Loss of Interaction Control" discussion for billets and plates, there was no bases given for why two billets in a stacked arrangement was considered bounding (as a contingency failure) and why the occurrence of that arrangement was "unlikely". Under the "Third Formed Part" section for the Abar Furnace, there was no bases for why three stacked parts are bounding or unlikely, why full water reflection bounds furnace reflection, and why a 70 percent uranium density bounds the parts placed in the furnace. Under the Evaluation of Uranium Metal Scrap Handling section, there was no basis for why the maximum effective density of scrap was less than 74 percent and the minimum effective density was greater than 18 percent. Discussions suggested that the scrap would be similar to E-Wing sheared metal pellets, but no justification was given. Flat plates and pieces of scrap expected in O-Wing would not necessarily be similar to pellets (with a packing fraction and resulting void) in E-Wing. Finally, the Storage Safe section specified that only one billet would physically fit in each storage location. There was no basis or control on this specification. All of these missing bases and associated ties to CSR requirements brought the adequacy of the CSE into questions. Additionally, a review of other CSEs noted similar concerns.

Walkdown of Other CSRs. A walk down of other CSRs in the field documented in the ORR Assessment Form for Core Objectives 1 though 4. The walk down noted the presence of specialized drip pans located next to the M-Wing machine coolant centrifuges that were not covered by the M-Wing CSR-MCS-056. The drip pans also were not covered under the drip pan requirements in CSR-CMH-012. This resulted in a finding, A1-CS-04, as discussed in that ORR Assessment Form section.

CSR Deficiencies and PNCs. The criticality safety deficiency and Procedural Noncompliance (PNC) program, as defined by Procedure Y70-68-003, was reviewed with the NCSO compliance, planning, and resources group leader. The NCSO Deficiency Summary Report for February 3, 1998, was reviewed. The report was generated monthly and was reviewed by management. The report analyzed the composite data for deficiencies occurring at Y-12 and looked for trends in the data. The report showed that the number of NCS deficiencies had been fairly constant throughout the last two years (~180 deficiencies per year). The data for the last month of 1998 indicated that the rate of occurrence was within the range expected if the annual rate continued. The report showed that EUO accounted for the majority of these deficiencies (~63 percent) over the last 24-month period). This was not unusual for the size of the EUO facilities and the increased attention operations there had received. A summary of the EUO deficiencies and PNCs occurring from December 1997 to the end of February 1998 was obtained from the NCSO group. This summary contained a total of 83 deficiencies and PNCs of which 63 occurred in Building 9212 and 20 occurred in Building 9215. The number and distribution of deficiencies between the EUO buildings did not seem unusual. The vast majority of these deficiencies were closed out. Several open deficiencies and PNCs were reviewed to determine their root cause and identify potential faults in the CSR implementation and authorization process. These deficiencies and PNCs were DEF-126-96, DEF-131-96, DEF-071-97, DEF-102-97, DEF-007-98, PNC-53-96, PNC-16-98, and PNC-54-98. All of these deficiencies and PNCs, except DEF-126-96 and PNC-54-98 were associated CSR-CMH-012 (concerning containers and material handling) and/or CSR-STOR/E-014 and CSR-STOR-C-037 (both storage CSRs); so, the associated Implementation and Authorization Checklists for these three CSRs were obtained for review.

PNC-16-98 represented a documentational oversight in addressing Np-237 (in small quantities) found in containers in the area. PNC-53-96 and DEF-131-96 concerned the materials being stored in containers not approved for it, as controlled by CSR-CMG-012 (and CSE-STOR-C-037 for DEF-131-96). DEF-102-97 concerned material being stored that exceeded height and weight restrictions for the container its being stored it, as controlled by CSR-CMH-012. DEF-007-98 concerned material being stored in containers that do not meet their size restrictions, as controlled by CSR-CMH-012. PNC-54-98 concerned the existence of storage racks that do not meet dimension restriction, as controlled by CSR-STOR/E-014. DEF-71-97 concerned a dumbwaiter that does not meet physical design requirements, as controlled by CSR-CMH-012.

PNC-53-96 and DEF-131-96 existed before the new CSRs were implemented and may have represented failures of the past CSA program and conduct of operations in the field. The remaining deficiencies and PNCs occurred under the CSR program and represented failures of the equipment to match conditions analyzed and required for criticality safety. These failures ultimately suggested that the CSR validation and implementation process failed.

As part of the validation and implementation of CSRs as directed by Procedure Y70-37-102, each CSR was validated against a checklist asking such questions as "Do the passive design features match actual field configurations?" and "Can the administrative requirements be met with equipment available?" These questions were answered by operations appointed participants, including shift technical advisors (STA), process engineers, and operations personnel familiar with the process. The intent of these questions was to identify deficiencies like those found in the deficiencies and PNCs being reviewed. In reviewing the checklists associated with CSR-CMH-012, CSR-STOR/E-014, and CSR-STOR-C-037, it was found that all of the checklists indicated the CSR requirements had been satisfied before the CSRs became effective.

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A review of the deficiencies and PNCs indicated that all of the conditions that caused the deficiencies and PNCs had existed before the CSRs were implemented. Therefore, a weakness existed in the CSR validation and implementation process that allowed oversights to occur such that equipment and material deviations as compared to CSR requirements can exist.

CSR-CMH-012 covered the use of containers and the transporting of fissile material. CSR-STOR-C-037 covered various storage systems such as safe bottle storage racks and positions, can storage racks, storage arrays, and sample bottle storage in the Chemical Areas of 9212. (CSE-CMH-012 extensively used CSAs to justify requirements.) CSR-STOR/E-014 covered various storage systems such as storage arrays, racks, safes, and cabinets found in E-Wing. A review of CSR-STOR-C-037, CSR-STOR/E-014, CSR-CMH-012, and Procedure Y70-37-103 (which implements CSR-CMH-012) indicated that these CSRs covered large numbers of storage devices and storage containers. It was easily seen that the sheer number of storage devices and containers were the reason why particular deviations from the CSR requirements were not identified as part of the validation and implementation of the CSRs. Many of these storage devices were not standardized (i.e., the storage devices were different in configuration and dimensions). Additionally, there was a large number of different storage containers. For example, there were 14 types of cans, such as the "Gallon Can", "Short Gallon Can", "Short Offsite Can", "Medium Offsite Can", "Tall Offsite Can", and "Generic Can". This extreme diversity was due to the long operating history of the facility. This extreme diversity made the implementation of criticality safety more complex and, as demonstrated by the deficiencies and PNCs being reviewed, required a greater amount of effort and detail being expended in confirming adherence to CSR requirements. Evidently this greater amount of effort was not being expended for the validation and implementation of these CSRs. Serious consideration should be taken to minimize the diversity in storage devices and containers and standardize to a few such types. This diversity was also a concern for future operations in that accidental deviations in operator conduct was more likely because of the diversity. Hence, the probability of failure of the CSR requirements was more likely.

STA Interpretation of CSR. STAs were authorized to resolve some NCS issues, STA interpretation guidance and training was discussed with the NCSO EUO resumption group leader. Specific training by NCSO was given to STAs to develop an understanding of parameters important to criticality safety. The STA guidance on response to deficiencies was reviewed.

Guidance to STA on how to respond to deficiencies was contained in Y/DD-724. As part of STA qualifications, they were trained on Y/DD-724 and the CSR program and process. When problems were identified by operations, they were referred to the shift manager who consults the STAs. The STAs could consult NCSO directly or use Y/DD-724 to determine appropriate responses to situations found. STAs from 9212 and 9215 were contacted to verify this and get an example of the types of problems being referred to them for interpretation and response. The qualification package for one STA was reviewed to confirm that programmatic aspects of the CSR program and Y/DD-724 were part of their training. The stated response of the STAs to CSR interpretation requirements was consistent. All of

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them understood they could not make interpretations of CSRs and had to refer such issues directly to NCSO. They all specified they could respond to particular deficiencies and PNCs according to Y/DD-724 before referring the matter to NCSO for further resolution (as part of the deficiency and PNC process). A slightly different philosophy existed between Buildings 9212 and 9215 in the use of CSRs in the preparation to talk to NCSO. (The STAs have controlled copies of the CSRs in a binder in their office.) The Building 9212 STA said if a problem existed (such as in determining the meaning of a CSR posting or procedural step) the CSRs would be reviewed. The review of the CSRs occasionally provided information that was not completely contained in a procedural step or on CSR postings. Also, a review of the CSRs allowed the STA to determine correct CSRs that applied to operations that operators could not identify a CSR for or had identified the wrong CSR for. The use of the CSRs in this manner was consistent with their intended function. In this manner, NCSO did not have to be consulted (or their time wasted) on insignificant issues. (For example, the Building 9212 STA noted that, if a CSR posting did not clearly provide sufficient guidance but the CSR contained clear guidance therein, this information was related to the operator, but operations would be halted until a memorandum of communications from NSCO was obtained. Additionally, the CSR posting would be changed at a later date. The Building 9215 STA said the CSRs were never referred to because they were implemented into other operational documents, such as procedures and drawings. If a problem existed in understanding a procedural step that implemented a CSR, NCSO was contacted and was always involved for every issue. This would seem a bit extreme, but conservatively results in safe problem identification and resolution system. In both cases, STA response to CSR issues seemed to be consistent with policy and good practice.

CSA/CSR Surveillances. The CSA/CSR surveillance process was discussed with the Building 9212 and 9215 surveillance coordinators. Refer to discussion in the ORR Assessment Form for Core Objective 10.

Verification of CSR Approvals. To determine if CSRs had been analyzed, reviewed, and approved by the appropriate individuals, a total of 11 CSRs were sampled. Four CSRs for accountability operations (specifically CSR-NDS-020, CSR-WVS-025, CSR-HC-041, and CSR-C-IR&S-048), four CSRs for casting operations (specifically CSR-CMH-012, CSR-STOR/E-014, CSR-CE/W-016, and CSR-CP-044), two CSRs for machining operations (specifically CSR-MO-053 and CSR-CPK-057), and one CSR for rolling and forming (specifically CSR-OW-060) were verified. Procedure Y70-68-001 defined the review and approval process for CSRs. The CSRs were signed by the CSR analyst and reviewer, approved by the Nuclear Criticality Safety Organization (NCSO) manager (or designee), and accepted by the operating organization. Y/DD-694 defined the qualifications necessary to be an analyst, reviewer, and approver of CSRs. The operating organization acceptance on the CSR was controlled by the CSR approval procedure, but the qualification level and/or authority level of the individual signing for acceptance on the CSR was not defined. (An extensive implementation process for the CSR assured that CSR requirements were incorporated into controlled documents such as drawings and procedures. This process also contained review and approval elements that were reviewed as part of the walk down and implementation process.) For the older CSRs (before mid 1997), an acceptance signature was not required on the CSR (although the implementation documentation on file with the CSA/CSR coordinator

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contained signatures as part of the CSR implementation process). For new CSRs (after mid 1997), operating organization acceptance signatures were either the operations manager or the deputy operations manager. Qualifications of NSO individuals were verified against the current revision of Y/DD-587 and older revisions for individuals that had left the NCSO group. The verification also checked the qualification date against the signature date on the CSRs. As part of verifying that CSRs had been reviewed and approved by the appropriate individuals, assistance from one of the NCSO engineers and the CSA/CSR coordinator was required to determine the names of the analysis, reviewers, approvers, and acceptors because the signatures were difficult to read to determine who the signing individual was. Since the CSRs (and CSEs) were quality documents, the individuals signing these documents should have been clearly identified (with printed names) to afford traceability of these records to authorized signers. No other problems were noted.

Review of Stack 38 and 48 CSRs. CSR-S38-032 and CSR-S48-033 were reviewed as part of a safety document's review of the ventilation system controls implementation. The CSRs were reviewed for consistency and adequacy of requirements to satisfy double contingency. Two differences were noted. CSR-S48-033 contained a requirement that precluded the change out of HEPA filters "during periods of precipitation or while maintenance is being performed on water/liquid lines in the immediate vicinity." CSE-S38-032 did not. CSR-S48-33 contained a Section 6, Posted Criticality Safety Requirements. CSR-S38-032 did not. Copies of the associated CSEs were obtained and discussions were held with the NCSO personnel. This missing Section 6 in CSR-S38-032 was required by Procedure Y70-68-001 (Appendix E, Format and Content of CSRs). Since there were no posting requirements for either of these CSRs, the absence of Section 6 in CSE-S38-032 did not affect safety and only represented a minor oversight in the review and approval process of the CSR. When NCSO personnel were consulted as to why a HEPA handling requirement was in CSR-S48-033 and not in CSR-S38-32, they replied that the Stack 48 exhaust system was outside (allowing potential exposure to precipitation during filter change out), while the Stack 38 exhaust system was not. A review of CSE-S38-032 and CSE-S48-033 was made to determine if this information and justification was included in the CSE. CSE-S38-032 did not specify the location of the exhaust system components in relationship to potential exposure to precipitation or water/liquid lines in the immediate vicinity. CSE-S38-032's contingency analysis also did not address any moderation upsets other than the collection of liquids in the ventilation system, and, specifically, did not address any potential moderation source during filter change out. Discussions with an HVAC process system engineer confirmed the location of equipment associated with Stack 38. The filter housing was located inside E-Wing and the stack was located on the roof.

Field observations of Stack 38 were conducted to determine the presence of water/liquid lines in the immediate vicinity of the Stack 38 filter housing. The housing was located in the corner of the room along the outside walls. Liquid lines associated with solvent solution storage tanks, what looks like a roof rain water drain line and condensate drain lines off of the ventilation ductwork running to an 11-liter bottle, were located near the filter housing. The probability of these lines leaking or providing a source of moderation while filters were being changed out was low. Maintenance on any of these lines would probably not produce a water/liquid spray that would moderate or wash off uranium on the filters when they were being removed. Therefore, it seemed reasonable for no handling restriction to exist during maintenance on these lines, but the rationale for this decision should have been included in the contingency analysis of CSR-S38-032.

Inventory and Holdup CSR. In comparing the Phase A process list contained in the EUO Plan of Action to the Building 9212 and 9215 Phase A1 CSRs identified by operations, it was noticed that CSR-VPD-007 for E-Wing inventory and holdup verification processes was not effective or approved. Subsequent investigation showed that CSR-VPD-007 was canceled after other CSRs, primarily CSR-CMH-012, were implemented containing controls that made CSR-VPD-007 redundant. Therefore, CSR-VPD-007 had been formally canceled and deleted from the controlled list of EUO CSRs.

Potential Enrichment Upsets. Most of the EUO part manufacturing CSE/CSRs assumed the maximum enrichment of material was 94% In reviewing several CSRs, it was noticed that requirements existed for uranium enriched up to a higher level (97.7%). An increase in the enrichment for processing higher enriched materials would more than likely result in decreased mass, volume, or container limits in CSRs or a requirement to completely re-evaluate the process or particular parts of the process. NCSO was contacted to determine the extent of use of 97.7% enriched uranium to determine if adequate controls existed to make the inadvertent presence of higher enriched material in processes evaluated for 94% enriched material acceptable from a criticality safety perspective. 97.7% enriched material was used for blending with slightly off-specification enriched uranium to achieve product specification enrichment. It was also used under special procedure and manufacturing packages. Activities that involve blending of 97.7% enriched material to achieve product specification enrichment were already evaluated for the 97.7% enrichment (or higher) where appropriate.

It was noted that the CSRs contained no specification as to the enrichment assumed (and hence limited) by the CSE. Since the CSR was used only as an operations/shop floor implementation document, the CSRs would have not necessarily needed to contain a specification and requirement on enrichment. Because the use of 97.7% enriched uranium under special procedure and operations would receive special review, NCSO would have checked the CSE to determine the enrichment assumed as part of the bases of safe operation along with other assumptions, boundaries, and hazard analysis to determine if changes to an operation were enveloped within the criticality safety basis.

Conclusion:

The findings and weaknesses identified under this functional area indicated that significant problems exist in the criticality safety program. These findings and weaknesses, although not clearly leading to an unacceptable risk of criticality, demonstrated that aspects of the criticality safety program were not working effectively. These aspects included the traceability of criticality safety documentation and the

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thoroughness of the implementation of criticality safety requirements into operations. Considering (1) that these operations were exactly the same or extremely similar to previously conducted operations, (2) operations personnel were aware of and dutifully follow CSR requirements, and (3) operations were stopped in a safe manner when criticality safety requirements were not understood or problems occur, it was not unreasonable to assume that operations could be conducted in a safe manner after the prestart findings had been addressed, the root causes of the findings had been determined, and operations had assessed that similar deficiencies that might exist would not affect the safety of operations.

Inspected by: J. J. Bazley	Approved by:____________________ ORR Team Manager Date:

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Functional Area: MODIFICATIONS (MD)	Core Objective Number: (CO-5)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. The change control procedures has been approved.
2. The change control procedure requires Unreviewed Safety Question Determinations (USQD) or USQD screening work sheets to be performed.
3. Personnel are trained on the change control procedure.
4. Modifications are installed in accordance with approved procedures.

Personnel contacted/position:

EUO Technical Support Deputy Manager
EUO Engineering Manager
Engineering Support (Design) Manager
High Capacity Evaporator Process Engineer
Configuration Management Change Administrator
Engineering Support (Design) Engineer
E-Wing Storage/Containers & Material Handling Process Engineer
Building 9212 HVAC Process Engineer

Records & other documents reviewed:

Y/MA-7368, *EUO Guidance - Grading Systems, Structures, and Components (SSCs)*
Y-12 CM-43/RI, *Y-12 Guidance for Grading Systems, Structures, and Components*
Procedure Y10-37-036, *Configuration Management - Change Control Process*
Y/MA-7312, *EUO Configuration Management Plan*
Change Request #EUO-1998-088, *Temporary Caulking for Filter Housing*
Change Request #EUO-1998-087, *Changes for Stack 38 Filter House, Ductwork & Fan*
Y53-35-TP-1901, *HEPA System Testing for Safety Class & Safety Significant Ventilation and Filtration Systems*
Y/MA-7290, *The Basis for Interim Operation for the 9215 Complex EUO*

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Y/MA-7254, *The Basis for Interim Operation for Building 9212 EUO Complex*
Procedure EP-DC2-02, *Design Process Interface for Projects*
Procedure Y10-153, *Temporary Modification Control*
Change Request #EUO-1998-126, *Connect Argon Vent Line to S38 Ductwork*
Change Request #EUO-1998-144, *Remove Storage Array STOR-AE-51 from Service*
Change Request #EUO-97-547, *Process Condensate Recirculation Pumps and Transfer Pump Design Changes*
Change Request #EUO-1998-123, *Install Base Radio Station in 9212 Shift Manager's Office*
Draft *Y-12 Engineering and Technical Staff Qualification Requirements Data Form*
TMS Database

Evolutions/operations witnessed:

Checked the as-built installation of two recently completed change request packages, EUO-1998-087 and EUO-1998-126.

Discussion:

A review of the current systems, structure, and component (SSC) grading process indicated that the recently issued procedure Y-12 CM-43/RI and EUO guidance document Y/MA-7368 use four grade levels (1, 2, 3, and 4) with an "N" appended to the grade if the SSC was criticality safety-related. This approach was simpler and easier to understand than previous approaches, as verified through interviews with technical support (TS) and engineering personnel at various levels within the organization. All TS and Engineering personnel received formal training on Procedure Y-12 CM-43/RI and less formal "awareness" training on the EUO guidance document Y/MA-7368 at the time of issuance. A sample review of six recent modification packages indicated that all were properly graded and processed correctly in accordance with their grade as per the approved procedures.

The change process, as described in Y10-37-036 and confirmed by reviewing the six recent modification packages, was clearly defined, complete, and well understood by those TS and engineering personnel who were all trained on this procedure prior to use. However, the following exceptions were noted:

a. PROBLEM DESCRIPTION: The guidance provided in the procedure was somewhat vague and needed further development. Only three out of six modification packages provided a comprehensive explanation of "why" a change was necessary, (e.g., necessary to comply with a licensing commitment, needed to pass a failed surveillance test, etc.). Frequently, the section titled *Problem Description* included just a list of symptoms or deficiencies (e.g., top plate leaking, fan seals need replacing, or additional test points were needed). One change request package marked this section "unknown". By practice and procedure, process engineers were expected to research past modifications prior to making a change. Without knowing why a previous change was made, a process engineer cannot properly trend past problems, perform a comprehensive root-cause analysis, or determine if they may invalidate a past change (especially one implemented in response to a regulatory commitment).

b. POST-MODIFICATION TESTING: Procedure Y10-37-036 clearly required that post-modification testing requirements were to be identified, as necessary. However, the guidance was disproportionately brief considering the importance of the need to ensure that an SSC will perform its intended function after a change had been made. One of the sample modification packages, which modified the Stack 38 HEPA filter system, indicated "N/A" regarding post-modification testing, when a HEPA filter DOP and system integrity test were needed to ensure proper operation prior to placing the system into service. In reality, this test would have to be performed before restart for other reasons, but the change request package was still deficient. Frequently, the process engineer specified that a post-maintenance test be used after a modification. This presented a problem, because maintenance wrote their own post-maintenance test procedures with little input from the process or design engineers who represented the EUO Design Authority and had access to, and knowledge of, the design and regulatory bases. Post-maintenance tests can sometimes be used interchangeably with post-modification tests if the engineering group reviewed and approved the method of testing, the operating modes, and acceptance criteria; however, this was not currently the practice regarding testing. Several different interpretations of post-modification test requirements were given by various technical support and engineering personnel indicating a need for further guidance.

c. AFFECTED DATABASES: The change procedure adequately addressed the need to identify documents that might be affected by the modifications. However, no comprehensive guidance was provided regarding the identification of databases that might be impacted by the change, even though several important databases existed or were under development. Examples included the computerized Master Equipment List (MEL) and Linking database (which identified related equipment and documents), COMPASS, and EICMS.

A general facility walkdown was performed with a technical support and engineering department process engineer. No uncontrolled system modifications were found. Specific walk downs of EUO-1998-087 and EUO-1998-126 were also performed to determine if the modifications were installed as per the approved change requests. No unexplained deficiencies or inconsistencies with the approved change request packages were found, with the exception of an incorrectly closed Deficiency Report (DR) discussed in CO-6.

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A review of the training requirements indicated the following:

a. All technical support and engineering personnel were required to take various site-specific initial and periodic training related to plant access (e.g, RadWorker II, Respirator, MAA Indoctrination, etc.). Since all technical support and engineering personnel interviewed had current badges, these requirements were met.

b. Currently, with the exception of USQ training, there was no job-specific (special requirement) training required beyond site-specific training for technical support and engineering personnel.

c. DOE Order 5480.20A, Section SA-B required that all personnel be qualified for their job. This requirement did not have to be met until 1999.

d. A sample review of TMS records for three process engineers, two central engineering support (CES) engineers, and one central engineering designer indicated that the required site-specific training had been completed, although job-specific training on systems, administrative guidance, etc. was sporadic.

A positive feature of the current change control process was the assignment of two design engineers to review all maintenance job requests prior to performing work for possible unauthorized modifications. This practice further helps ensure that no maintenance changes inadvertently occur outside of the formal change control process.

Conclusion:

the change control Procedure Y10-37-036 meets all of the ORR criteria in this area with the exception of guidance regarding post-implementation testing (Finding A1-MD-03), and the need to clearly identify all related databases that may be impacted by each change (Finding A1-MD-02). Additionally, a walk down of one change package revealed a problem with premature MJR and DR closeout (Finding A1-MD-01). The procedure would meet all the criteria if these three findings are properly addressed in the procedure.

Inspected by: G. P. Zagursky	Approved by: [signature] ORR Team Manager Date: 4/14/98

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Functional Area: MODIFICATIONS (MD)	Core Objective Number: (CO-6)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Processes are physically and functionally consistent with their descriptions in the BIOs, OSRs, and CSRs.

2. Approved USQDs document how facility modifications are consistent with safety documentation.

Personnel contacted/position:

Building 9212 HVAC Process Engineer
Configuration Management Change Administrator
High Capacity Evaporator Process Engineer
Engineering Support (Design) Manager
Engineering Support (Design) Engineer
E-Wing Storage/Containers & Material Handling Process Engineer
Central Engineering Liaison
Restart Team Manager
Building 9212 HVAC Process Engineer

Records & other documents reviewed:

Drawing S38-V1, *Stack System Diagram, Stack 38, Room 1008*
Drawing S33-V1, *Stack System Diagram, Stack 33*
Drawing S33-V2, *Stack System Diagram, Stack 33*
CSR-S33-011, *Stack 33 Exhaust*
CSR-S38-032, *Stack 38 Exhaust*
Procedure Y70-809, *Unreviewed Safety Question Determination*
Change Request #EUO-1998-087, *Changes for Stack 38 Filter House, Ductwork & Exhaust Fan*
Change Request #EUO-1998-088, *Temporary Caulking for Filter Housing*
Change Request #EUO-97-S47, *Process Condensate Recirculation Pumps and Transfer Pump During Changes*
Change Request #EUO-1998-123, *Install Base Radio Station in 9212 Shift Manager's Office*

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Change Request #EUO-1998-126, *Connect Argon Vent Line to Stack 38 Ductwork*
Change Request #EUO-1998-144, *Remove Storage Array STOR-AE-51 From Service*
Procedure Y10-37-036, *Configuration Management - Change Control Process*

Evolutions/operations witnessed:

Checked the installation of change request packages EUO-1998-087 and EUO-1998-126.

Discussion:

The USQ sheets from six change request packages were reviewed to ensure they were complete, correct, and consistent with the safety documentation. Procedure Y10-37-036 requires all change request packages to have an associated USQ or screening review. Of the samples reviewed, all six were completed in accordance with the approved procedures, Y10-37-036 and Y70-809.

Interviews with various process engineers and technical support management personnel responsible for developing, reviewing, and approving USQ reviews indicated an overall high level of understanding of the USQ process. All involved in the USQ process received formal USQ training.

A walk down of two recent change request packages developed under Y10-37-036 indicated that the modifications were installed consistent with the appropriate USQ reviews, appropriate BIO/OSR commitments, and CSR requirements, with the exception of the following observations.

A review of change request package EUO-1998-087 and related documents, such as Deficiency Reports (DR) and Maintenance Job Requests (MJR) resulted in the following:

a. Two (19A and 19B) of the six items to be changed under this change request were deferred until after restart as designated by the restart team manager. The two deferred items were documented on DR 9212-98-00126 ("replace round sheetmetal blankoff on top of filter house with 1/4" plate") and DR 9212-98-00217 ("replace bolts on intake flange of filter"). Corresponding MJRs were written for each DR.

b. Maintenance worked DR #9212-98-00126 and its associated MJR #0058129 prior to restart.

c. Both DR #9212-98-00126 and MJR #0058129 were incorrectly shown as closed, even though the work was not completed as specified in the approved change request package. The original 1/8-inch plate was <u>not</u> replaced with the required 1/4-inch plate as specified. This constituted an unauthorized field change as confirmed in the MJR Spare Parts/Material Record and by visual

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examination. With both the MJR and DR closed, plant configuration was lost as well as the mechanism ensuring that this change would eventually be installed as intended by the Technical Support and Engineering Groups.

Conclusion:

The guidance for performing USQ reviews and the performance of these reviews were found to satisfactorily meet all of the criteria in this section. However, loss of physical configuration occurred in a modification on the Stack 38 HVAC housing as described in Finding A1-MD-01. When the change request procedure and other supporting processes are enhanced to prevent the premature closeout of MJRs and DRs, all of the ORR criteria will have been satisfactorily met.

Inspected by: G. P. Zagursky	Approved by: [signature] ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: PROCEDURES (PR)	Core Objective Number: (CO-7)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Approved operating procedures, including job performance aids (JPA) exist for normal, abnormal, alarm, and emergency conditions.

2. Operating procedures incorporate the requirements of the safety documentation.

Personnel contacted/position:

Casting Shift Supervisor
Casting Operator
B-1/C-1 Shift Supervisor
Chemical Supervisors
Chemical Operators
Building 9215 MAA Functional Manager
M-Wing Machining Production Manager
M-Wing Process Engineer
M-Wing Shift Supervisor
Machine Coolant Operators
O-Wing Supervisors
O-Wing Machinists
Restart Test Engineer
Production Managers
Shift Technical Advisors
EUTO Material Clerk
Dimensional Inspection Supervisor
Dimensional Inspection Operators

Records & other documents reviewed:

JPA-EW-C-SACL-0001, *E-Wing Casting - Stack Assembly*
JPA-EW-C-SACL-0002, *E-Wing Casting - Crucible Loading*
JPA-EW-C-FLUL-0001, *E-Wing Casting - Main Line Conveyor*
JPA-EW-C-FLUL-0002, *E-Wing Casting - Main Line Conveyor Unloading*

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JPA-EW-C-FLUL-0003, *E-Wing Casting - East Furnace Unloading*
JPA-EW-C-FLUL-E/W0002, *E-Wing Casting - Furnace Loading*
JPA-EW-C-CAST-E0001, *E-Wing Casting - East Furnace Preparation*
JPA-EW-C-CAST-E0002, *E-Wing Casting - East Furnace Manual Operation*
Procedure Y10-102, *Technical Procedure Process Control*
Procedure Y10-135, *Command Media Development*
Procedure Y10-37-032, *Job Performance Aids*
Procedure Y50-37-20-104, *Manual Operation of the Gantry*
Procedure Y50-37-036, *Generic Wet Vacuum Trap Normal Operations*
Procedure Y50-37-001, *Generic Wet Vacuum Final Trap Surveillance*
Procedure Y50-37-98-601, *High Capacity Evaporator, NC/O-C-7101 Operations*
Procedure Y50-37-98-602, *High Capacity Evaporator Process Condensate Monitor Test*
Procedure Y10-37-037, *Enriched Uranium Operations Document Control*
Procedure Y70-160, *Criticality Safety Approval System*
Y/MA-7255, *The Operational Safety Requirements for Building 9212 Enriched Uranium Operations Complex (U)*
JPA-B1-LAB-0001, *Use of Laboratory Hoods*
JPA-B1-LAB-0007, *Standard PPM Analysis*
JPA-B1-LAB-0011, *Calibrating the pH Meter*
JPA-B1-LAB-0012, *pH Analysis*
Procedure Y50-37-93-800, *Fluorometer Setup*
Procedure Y50-37-10-002, *M-Wing Machine Coolant System*
Procedure Y50-37-10-006, *Machining Operations*
Procedure Y57-37-65-028, *Casting Furnace Alarms - East Line*
Document Y/MA-8324, *Furnace Run Details (U)*
Procedure Y50-37-20-003, *Rolling Mill Operation*
Procedure Y50-37-92-503, *Headhouse Fan Room Wet Vacuum Normal Operations*
Procedure Y70-37-102, *Validation and Implementation of Criticality Safety Requirements*
Procedure Y50-37-20-020, *Ajax Salt Annealing and Washing System (Jack Rabbit Conveyor)*
Procedure Y50-37-20-002, *Billet Salt Bath Operation*
Procedure Y50-37-20-055, *Operation of the Gantry Control System*
Procedure Y50-37-20-056, *Verson 25" Hydroform Operation*
Procedure Y50-37-20-063, *Convection Oven Operations*
JPA-OW-SCS-0001, *Scrap Shear Operation*
CSR-OW-060, *O-Wing Operations (U)*
Procedure Y70-37-102, *Validation and Implementation of Criticality Safety Requirements*
Procedure Y50-55-DI-H002, *Moore Measuring Machine Operation in H-2 Fissile Inspection Area*
Procedure Y50-37-98-667, *Filter and Separate Station Operation*
JPA-EU-0010, *Sampling Safe Bottles*
Procedure Y50-37-65-104, *Enriched Uranium Chip Drying and Briquetting*

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Functional Area: PROCEDURES (PR)	Core Objective Number: (CO-7)	Date: April 14, 1998

Procedure Y50-37-98-668, *Code 80 Glovebox Operation*
Procedure Y50-55-PT-E464, *Operation of 1 MeV/2MeV Linac, Building 9998*

Evolutions/operations witnessed:

Casting stack assembly, furnace loading, and casting a part
Fluorometer and pH meter calibration followed by a pH and PPM analyses
Start up of machine coolant system
Machining of two parts on separate machine
O-Wing rolling mill pre-startup valve and electrical breaker/switch alignment
Wet vacuum system operations
High capacity evaporator operations
Transformation of a billet into a rolled plate
Hydroforming a part
Sampling and transfer of process condensate
Scrap shear operations
Dimensional inspection of a part
Sampling safe bottles
Chip drying and briquetting
Sifting oxide in a glovebox
Radiography operations

Discussion:

A casting shift supervisor was interviewed to assess his understanding of the job performance aid (JPA) and procedure revision process. His answers were compared to the requirements of Procedure Y10-102 and Procedure Y10-37-032. No deficiencies were noted. In addition, the casting shift supervisor and an operator were observed creating a stack assembly, loading it into a furnace, and casting a part to verify the latest JPAs were used and they were adequate and correct. The supervisor said he verified the JPAs were current using the Electronic Information Content Management System (EICMS) to find the latest revision and its effective date. No deficiencies were noted. In addition, an abnormal operating procedure (Y57-37-65-028) was used to correct an over-frequency trip that occurred during the start up of a furnace in preparation for casting a part. It was adequate and verified current using the EICMS. No deficiencies were noted with the response to the abnormal condition.

The Building 9212 OSR was reviewed. Requirements pertaining to the E-Wing casting furnaces water detectors were incorporated into JPA-EW-C-FLUL-E/W0002.

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A chemical operator was observed calibrating a pH meter and a fluorometer, and then performing a pH and PPM analysis to verify the latest JPAs and procedures were used and they were adequate and correct. The following deficiencies were noted (Finding A1-PR-02):

a. Step 4.1.[17] of Procedure Y50-37-93-800 required the "Blank Button" to be returned to the desiccator. However, this step was performed after Step 4.1.[8]. The operator said the blank button should be returned to the desiccator after removing it from the sample slide (Step 4.1.[8]) and stated several reasons for it.

b. Step [9] of JPA-B1-LAB-0007 required the operator to pull <u>and hold</u> the switch marked ".1". The operator pulled the switch but did not hold it. Later, a mentor said the switch probably used to be a spring loaded switch. However, now it was not spring loaded; therefore, there was no reason to hold it.

c. Steps [8] and [9] of JPA-B1-LAB-0011 required the STD key to be pressed and to verify the bottom of the meter screen indicated 4.0. Step [10] was redundant in that it also required the STD key to be pressed and to verify the bottom of the meter screen indicated 4.0. When asked, the B-1/C-1 shift supervisor said he verified the JPAs and procedures were current using EICMS to find the latest revision and its effective date. All JPAs and the procedure in use were the latest revision.

Start up of the M-Wing machine coolant system and subsequent machining operation was observed. Both procedures being used were approved and were the latest revision. The operating procedures incorporated the requirements of the safety documentation. The following deficiencies were noted in Procedure Y50-37-10-002:

a. In Section 4.1, *Mixing New Coolant*, it stated: "...add approximately 1289 grams of sodium nitrite ($NaNO_2$) to the mixture." When asked, the two operators said they did not know how much deviation was allowed from this amount. A process engineer later said ~5 grams was acceptable. Another chemical measurement, a run time, and a flowrate were also preceded by "approximately".

b. Section 4.3.1, *Startup of Clean Coolant*, stated: "<u>IF</u> clean coolant needs to be added to the settling trays, ..." When asked, the two operators could not state under what conditions they would add coolant. A process engineer later said coolant would be added to the settling trays only if they were empty. No guidance existed in the procedure.

c. Section 4.4, *Startup of Coolant Circulating System*, stated: "If the settling trays and storage trays to be placed in service require more coolant, <u>THEN</u> add coolant...." No other guidance existed in the procedure on when this should occur.

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d. Section 4.4, *Startup of Coolant Circulating System*, required sampling and determination of the propylene glycol concentration in the coolant. It did not require proceeding to Section 4.5, *Adjusting Chemical Makeup of Coolant*, if concentration was below 40 percent or above 60 percent.

Section 4.5, *Adjusting Chemical Makeup of Coolant*, stated: "IF propylene glycol concentration is >60%, AND instructed by the supervisor, THEN add demineralized water to each operating tray by opening corresponding valves in the following table, as necessary." The two operators, a supervisor, and a process engineer had different answers on how much water to add, how long to recirculate before sampling, and what concentration value the coolant should be adjusted to. No further guidance existed in the procedure, even though specific guidance, including an addition chart of coolant concentration versus number of bottles, existed for addition of sodium nitrite.

e. After startup of the coolant circulating system, the procedure required sampling of the coolant for propylene glycol. The two operators said they let it run for at least five minutes to get a representative sample. A process engineer later said 15 to 20 minutes of recirulation was needed for a representative sample. No recirculating time guidance existed in the procedure.

Ten persons (two chemical operators, one utility operator, one supervisor, his supervisor, one criticality safety representative, the DOE facility representative, a DNFSB staff member, one mentor, ORR team member) were involved in performing or witnessing Procedure Y50-37-92-503. Step 4.1.6, bullet 2, of the procedure stated the "water low flow" alarm should clear as a result of opening a valve. The alarm was labeled "Process Water Low Flow" on the panel (Finding A1-PR-02). The operators stopped and requested a PMR to address the discrepancy. The PMR took approximately 1.5 hours to obtain. Completion of a PMR resulted in a revised copy of the procedure being delivered from the document control center, and the procedure was reentered at Step 4.1.6, bullet 1, and all steps that could be completed in the area were completed (i.e., down to Step 4.1.11). After that problem was resolved, further editorial problems were found with one of the procedures scheduled for performance later that day, which would require another Procedure Modification Request (PMR). As a result, further work was postponed until the next day. The editorial correction had been previously documented in the procedure's history file and was scheduled to be fixed the next time the procedure was revised (Finding A1-PR-02). Procedure Y50-37-92-503 had been periodically performed since the 1994 shutdown.

Procedure Y50-37-036 was completed satisfactorily. Completion of Procedure Y50-37-036 started a four-hour clock in which Procedure Y-50-37-001 had to be completed. The procedure did not require the performer to record the time. Procedure Y50-37-001 could not be performed, as labels on component F-380, "East C-1 Wing Final Trap" did not agree with the procedure. The component shared use with the high capacity evaporator and had dual numbers. The procedure contained only one of the numbers, whereas the field component had two numbers. The evolution was stopped. An Administrative Hold Tag was required to return the system to its original configuration. It was pointed out to the performers that the tag was actually an Administrative Control Tag; therefore, they said two PMRs were required, one to return the system to "out of service" within the four-hour OSR window, and one to allow completion of the surveillance at a later date. When asked what "out of service" meant, the performers said they were unsure and eventually tagged the component in the "Warm Shutdown Mode" to comply with the OSR. This same procedure had delayed work on day 1 because of the same issue with regard to other procedurally listed components (Finding A1-PR-02). Procedure Y50-37-001 had been periodically performed since the 1994 shutdown.

Pre-job briefs and performance of Y50-37-98-602 and Y50-37-98-601 were observed. The procedure required three operators and a mentor; a supervisor must also be available. Also present were the deputy operations manager, a production manager, a supervisor, and a DOE representative. Y50-37-98-602, was completed successfully. Y50-37-98-601 had to be suspended due to a problem with JPA-B1-LAB-0007 in the B-1 lab. The B-1 lab must be available to complete performance of Y50-37-98-601. JPA-B1-LAB-0007 had been revised and reissued after being looked at earlier in the ORR. The revision omitted a step informing the operator to reset a switch. The B-1 supervisor informed the production manager for C-1, and the process was stopped. The supervisor, the mentor, and the production manager intervened in the procedure performance to direct the operators how to follow the Temporary Evaporator Shutdown section. The supervisor intervened during performance of Y50-37-98-602 prerequisites. (Finding A1-PR-02)

Procedure Y70-37-102 defined the process for validating a draft Criticality Safety Requirement (CSR), developing and tracking implementation requirements, and obtaining authorization for implementation. Section C, "CSR Implementation and Authorization" required the implementation team leader to complete "Implementation of Requirements" Appendix B, "CSR Implementation and Authorization Checklist," to track incorporation of CSRs into procedures or other documents. Appendix B for CSR-OW-060, *O-Wing Operations (U)*, was reviewed and the following deficiencies were noted:

a. Requirement 4.3.1 was <u>not</u> listed in procedure Y50-37-20-003, even though this procedure <u>was</u> listed as an implementing document on Appendix B.

b. Requirement 4.3.3 was <u>not</u> listed in procedure Y50-37-20-002, even though this procedure <u>was</u> listed as an implementing document on Appendix B.

c. Requirement 4.3.6 <u>was</u> listed in Procedure Y50-37-20-003, but this procedure was <u>not</u> listed as an implementing document on Appendix B.

d. Requirement 4.3.8 <u>was</u> listed in Procedure Y50-37-20-003, but this procedure was <u>not</u> listed as an implementing document in Appendix B.

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e. Requirement 4.3.8 was not listed in Procedure Y50-37-20-002, even though this procedure was listed as an implementing document on Appendix B.

f. Requirement 4.3.12 was listed in Procedure Y50-37-20-003, but this procedure was not listed as an implementing document on Appendix B.

g. Requirement 4.3.12 was not listed in Procedure Y50-37-20-020, even though this procedure was listed as an implementing document on Appendix B.

h. Requirements 4.3.4 and 4.3.5 were listed in Appendix B and C of Procedure Y50-37-20-104, but they were not designated as CSRs.

EUO document control center personnel were asked to provide copies of ten procedures, eight CSRs, and the Building 9212 and 9215 OSRs to ensure the document control center had the latest revision. All documents provided were the latest revision.

The following procedures were reviewed to determine if a viable system existed for the control and issuance of procedures and CSRs:

Procedure Y10-102
Procedure Y10-135
Procedure Y10-37-032
Procedure Y10-37-037
Procedure Y70-160
Procedure Y70-37-102

These procedures described a method for control and issuance of procedures, JPAs, and CSRs.

An O-Wing machinist and supervisor conducted a valve and electrical breaker/switch alignment using Procedure Y50-37-20-003. A verification and validation of the procedures had been performed a week and a half earlier by a procedure writer, shift technical advisor, and the same machinist who performed this alignment check. The following deficiencies were noted (Finding A1-PR-02):

a. Valve PRM-HV-864 was listed on the alignment checklist. However, the restart test engineer said this valve had been removed months earlier.

b. The mill grease switch on the main mill console was labeled PRM-HS-750A. However, the number on the alignment sheet was PRM-HS-737A.

c. The required position listed on the alignment sheet for component PRM-HS-611A was "CREEP". However, this position was not listed on the main mill console next to the component operating switch.

d. The required position listed on the alignment sheet for four components (PRM-HS-714A, PRM-HS-302A, PRM-HS-302B, and PRM-HS-302C) was "illuminated". Although none of the associated lights were illuminated, the machinist initialed the alignment sheet signifying they were in the required position. Later, an unqualified shift technical advisor (STA), who accompanied the machinist on the alignment checks, questioned the machinist about the required position of these four components. After further discussion with a restart test engineer, the machinist lined out his initials next to these four components and wrote a note in the comments section of the checklist. The test engineer said he would not expect the associated lights to be illuminated until the system was started.

An O-Wing supervisor, machinist, and the Building 9215 operations manager were interviewed to assess their understanding of the procedure revision process. Their answers were compared to the requirements of Procedure Y10-102. No deficiencies were noted. In addition, two O-Wing supervisors and three machinists were observed starting up, operating and shutting down the rolling mill, billet salt bath, and gantry control system to transform a billet into a plate to verify the latest procedures were used and they were adequate and correct. All three procedures that were used were approved and were the latest revision. However, the following were noted:

a. One of the steps in Procedure Y50-37-20-003 required going to Section 4.6 instead of Section 4.4 of Procedure Y50-37-20-055. A mentor said he recognized the problem while reading ahead in Procedure Y50-37-20-003 and told the production manager about it. The supervisor was also informed and stopped the procedure until a procedure modification request (PMR) was issued.

b. A PMR on Procedure Y50-37-20-002, which was issued the previous day, affected the performance of the pre-operational checks on a crane used for this activity. Section 3.2.[1] of the procedure required ensuring UCN-10843, *Inspection/Testing of Hoisting Equipment*, was available. A machinist ensured it was attached to the crane and commenced his pre-operational checks. However, a mentor stopped him and told him that performance of these checks was now listed in Section 4.1 of the procedure. The shift manager was informed of this step being performed out of sequence, noted it in his logbook, and authorized continuing the procedure.

c. One of the prerequisite action steps in Procedure Y50-37-20-055 required the supervisor to "Ensure the applicable part card is present and stays with the part through each process." After completing all the other prerequisite steps, the mentor told the supervisor to have the storage vault opened so he could verify the billet part card was present. The supervisor then completed this task. Neither the mentor nor the supervisor could explain how someone could ensure the part card stayed with the part through each process as a prerequisite action.

A chemical supervisor was interviewed to assess her understanding of the procedure revision process. Her answers were compared to the requirements of Procedure Y10-102. No deficiencies were noted. In addition, the supervisor and two chemical operators were observed sampling and transferring process condensate from hold-up tank F-6001 to a storage tank using Procedure Y50-37-98-601 to verify the latest version of the procedure was used and that it was adequate and correct. The supervisor said she verified it correct prior to use by either getting a copy from the document control center or used the EICMS to find the latest version and its effective date. The following deficiencies were noted with the procedure:

a. Step 4.7.4.[8] required the operator to select a transfer pump. Transfer pump J-6002A was selected and the operator attempted to start the pump as required by the next step. However, there was no indication that the pump started. Shortly thereafter, the shift manager told the supervisor that pump J-6002A could only be used with tank F-6000, that pump J-6002B had to be used with tank F-6001, and that the procedure was suspended until he reviewed the situation with all parties involved. The procedure did not address these conditions and the supervisor and operators said they were not aware of this. During the shift manager's review, it was determined that the pump might have started and no one knew it. Therefore, the shift manager directed that the status of the pump be checked locally. An operator discovered the pump was running, and the shift manager directed it to be stopped. The pump ran for one and one-half hours at a shut-off head without anyone knowing it.

b. Step 4.7.2.[1].[c] of the procedure required the operator to place the F-6001 inlet valve in "Lockout". However, the valve was already in "Lockout" and he proceeded to the next step. The next step required the operator to place the F-6000 inlet valve in "Open". However, the valve was already in "Open" and he proceeded to the next step. Both a mentor and supervisor were watching the operator perform these steps, but took no action. When asked, the mentor said they should have stopped the procedure and notified the shift manager for resolution, even though the valves were in the proper position.

An O-Wing supervisor and three machinists were observed hydroforming a part using three procedures to verify the latest procedures were used and they were adequate and correct. During this activity, start-up, operation, and shutdown of the hydroform, gantry control system, and a convection oven were also observed. All three procedures used were approved and were the latest revision. Two of the three procedures were adequate and correct. The following problems were noted with the other procedure:

a. The procedure did not allow the operator to shutdown the sheet rinse system (Step 4.4.[36] in Procedure Y50-37-20-055, which was part of the shutdown of the gantry control system) without performing the other steps in that section of the procedure, which was unnecessary.

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b. Step 3.3.[7] in the "Field Preparations" section of Procedure Y50-37-20-055 required the operator to place a recirculation pump in operation. The operator said that a recirculation pump was not needed to perform the hydroforming activity and the procedure needed to be changed to start a recirculation pump if desired or needed.

An O-Wing supervisor, machinist, and EUTO material clerk were observed shearing scrap metal using JPA-OW-SCS-0001 to verify the latest JPA was used and that it was adequate and correct. The JPA was approved, the latest revision, and adequate and correct. No deficiencies were noted.

The validation and implementation of a revision to CSR-OW-060 by an STA, production manager, and a process engineer were also observed to assess their understanding of the CSR revision process. The validation and implementation were performed in accordance with Procedure Y70-37-102, including completion of Appendix A, *CSR Validation Checklist*, and Appendix B, *CSR Implementation and Authorization Checklist.* No deficiencies were noted.

A chemical supervisor and three chemical operators were observed sifting oxide from the machine shop inside a glovebox using Procedure Y50-37-98-668. The following deficiencies were noted:

a. Step 3.3[4] pressure differential indicators were titled "DPI-138" and DPI-138" in the procedure, but were labeled "DGB-DPI-138" and DGB-DPI-139".

b. Step 3.3.[8] required the operator to "ensure carbon filters are installed." However, Step 3.3.[2] required a determination if the filters needed replacement. When asked, the operator said she looked at build-up on the filters to comply with Step 3.3.[2]. She also said replacement was determined by pressure differential across the filter, a step specified in Step 3.3.[4].

c. Prerequisite Sections 3.1, 3.2, and 3.3 had lines to the right of each step for the operator to check (✓) when completed. Performance Activities in Section 4 did not have corresponding check-offs. During the evaluation, the operators placed a check mark beside each step in Section 4 as it was performed.

d. The alignment checklist in Appendix A required only operator initials to verify the component was in the required position. As-found and as-left positions were not recorded or required.

e. Appendix B, *Component Deviation Sheet*, was used to obtain shift manager approval of components to be left in other than the required position. The top section of the form required description of "As-left" and "required" positions. The same information was required in a table in the middle of the sheets.

f. Step 3.3[2] specified actions to be taken if carbon filters were to be replaced, but did not indicate who or how this was determined. Steps 3.3[3]-[8] provided actions to take if carbon filters did not require replacement, but they were not formatted or captioned as such.

g. Section 3, Prerequisites, had a "✓" (check) column to the right of each step for the operator to mark as completed. Section 4, Performance Activities, did not contain this column. Throughout the evolution, the operators placed check marks beside each action completed in Section 4.

h. Step 4.1[3] directed the operator to perform Steps [35] through [40] if greater than 20 kg of oxide or UF_4 were in the glovebox. However, Step [35] was performed only when the screening container was full or when directed by the supervisor.

i. Step 4.1[15] required blending for 20 minutes. When asked, the operator said it was important to watch the V-blender after starting it to ensure its lids did not allow material to leak. No steps or CAUTIONS directed the operator to take this action.

j. Two-part steps were constructed using "AND" statements when the parts were correlated (e.g., 4.1[16], 4.1[26], and 4.1[27]). Splitting such steps reduced complexity and reduced misunderstandings.

k. The procedure specified weights to be taken that were recorded on *Skull Oxide/Vac Cleaning Work Sheet.* The work sheet had 1-26 items, but the procedure provided directions for only 1-25.

l. Step 4.1[34] was to "submit sample(s) and completed requisition for analysis." When asked, the operator said this meant leaving the sample on a work table for someone else to pick up and deliver to the Y-12 laboratory.

m. Cans were removed from the glovebox for transport to other locations or for weighing. The procedure did not always require cans to be bagged prior to handling and did not require RADCON smears of the can to ensure contamination was not being spread.

A chemical supervisor and two chemical operators were observed drying and briquetting stainless steel Brillo pads to verify the latest procedure was used and that it was adequate and correct. The latest revision of the procedure was used. The following deficiencies were noted during performance of the procedure:

a. Prerequisite steps ensuring the oxygen monitors and the argon drying hood heaters were energized were not included in the latest revision of the procedure. The mentor noted it in the post-job brief and said a typing error had caused the omission.

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b. In Step 4.9.2[1], CP-FIC-318, Loading Hood Argon Flow was labeled CP-FIC-318, Loading Box Argon Flow in the field. This discrepancy was not noted by the procedure performers.

Five Criticality Safety Requirements (CSR) were walked down to verify the conditions in the field matched the conditions required in the CSRs. A problem was noted with one of the five CSRs. In CSR-MCS-056, *M Wing Machine Coolant*, two centrifuges were used to remove enriched uranium particles from machine coolant. A stainless steel drip pan was beneath each centrifuge inlet and outlet piping connection to catch machine coolant taking from the piping flanges. Machine coolant was standing in the drip pans. CSR-MCS-056 did not discuss these drip pans. (Finding A1-CS-04)

Radiography operations in Building 9998 were observed using Procedure Y50-55-PT-E464. The following deficiencies were noted:

a. Y50-55-PT-E464 was a Category II procedure, requiring step-by-step performance of action steps in the specified sequence. Certain action steps were specified in the Precautions and Limitations section of the procedure, instead of the Prerequisites and Performance Sections, including the following:

   (1) controlling access to the console key

   (2) wearing a personal radiation monitor

   (3) completing a pre-use inspection checklist each day radiography was performed

b. Step 5.3.[10] of the procedure stated a laser beam on the X-ray head could be used to locate the center of the beam. When asked, the operators said the beam was not being used because it had not been properly aligned following relocation of the X-ray machine.

c. Step 5.3.[14] of the procedure was to press the appropriate energy level button, either 1 MEV or 2 MEV. The 2 MEV button was pushed as specified by the Category II procedure on the first exposure. It was not performed (and did not need to be performed) on the second through seventh exposures because the energy level had already been established. The procedure did not acknowledge skipping this step on multiple exposures.

d. Step 5.3.[19] was to adjust the dose rate "as needed." When the first exposure was initiated, this dose rate was 240 R at 1 meter. The supervisor intervened and adjusted the rate to 200 and stated the rate should never exceed 200 for a 2 MEV exposure. The procedure did not specify a maximum allowable dose rate.

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A Product Certification supervisor and two operators were observed performing a dimensional inspection of a mock-up weapons part using a Moore Measuring Machine. The Product Certification operations manager was present for most of the observation. A mentor was not present. The Special Instruction section of the applicable inspection form required the part to be cleaned prior to placing it on the measuring machine. After inspection, it also required an application of a protective coating on the part prior to replacing it back in the storage container. The operating procedure used by the operators performing the inspection, Procedure Y50-55-DI-H002, *Moore Measuring Machine Operation in H-2 Fissile Inspection Area*, did not require cleaning or applying a protective coating to the part. The operator actually cleaned the part. Both operators said they would apply the protective coating to the part after the dimensional inspection was complete.

Pre-job brief and performance of Y50-37-98-667 and JPA-EU-0010 were observed. Two operators, a mentor, and a supervisor were required for the operations; also present were the production engineer and a DOE facility representative. The supervisor intervened one time during performance of Y50-37-98-667, and the mentor intervened one time during performance of the JPA. Both operators performing the operations were conscientious and knowledgeable about the operations and exhibited excellent awareness of radiological conditions. The following problems were noted with performance of the operations:

a. The JPA directed the operator to add a gasket to the safe bottle prior to placing the bottle on the rocker. The JPA did not direct the operator to remove the gasket(s) prior to placing the bottle in storage. Leaving the gasket in place would most likely prevent the bottle from venting properly.

b. The bottle leaked with one gasket while being rocked during the JPA. The supervisor directed the operator to stop the operation and place a second gasket on the bottle. The production engineer said they had experienced the same problem during the dry run. The JPA only directed one gasket to be installed.

Conclusion:

A viable system exists for the control and issuance of procedures, JPAs, and CSRs. The document management center contains the latest revision of procedures, JPAs, OSRs, and CSRs. Procedures, JPAs, and CSRs observed in use are the latest revision. Operations personnel understand the CSR and procedure revision process, including how to verify the latest approved revision of a CSR or procedure. OSR requirements are contained in applicable operating procedures. Operating procedures or JPAs and their associated CSRs are consistent with each other. However, conditions in the field did not match conditions required by the CSR in one of five CSRs that were walked down.

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Functional Area: PROCEDURES (PR)	Core Objective Number: (CO-7)	Date: April 14, 1998

Seventy-five percent of the evolutions witnessed involved the use of procedures that were either inadequate, incorrect, or both inadequate and incorrect. When the prestart finding in this area (Finding A1-PR-02) is resolved, the criteria for this core objective will be met.

Inspected by: J. R. Sprenkle W. E. Hill	Approved by: ______ ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: MODIFICATIONS (MD)	Core Objective Number: (CO-8)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Modification packages for approved modifications to processes require a review for impact on operating procedures.

2. A change control process is in place to ensure that future modifications are reviewed for impact on procedures.

Personnel contacted/position:

Configuration Management Change Administrator
EUO Engineering Manager
Engineering Support (Design) Manager

Records & other documents reviewed:

Procedure Y10-37-036, *Configuration Management - Change Control Process*
Procedure Y53-35-TP-1901, *HEPA System Testing for Safety Class & Safety Significant Ventilation and Filtration Systems*
Procedure Y10-153, *Temporary Modification Control*
Change Request #EUO-1998-087, *Changes for Stack 38 Filter House, Ductwork and Exhaust Fan*
Change Request #EUO-1998-088, *Temporary Caulking for Filter Housing*
Change Request #EUO-97-547, *Process Condensate Recirculation Pumps and Transfer Pump Design Changes*
Change Request #EUO-1998-123, *Install Base Radio Station in 9212 Shift Manager's Office*
Change Request #EUO-1998-126, *Connect Argon Vent Line to Stack 38 Ductwork*
Change Request #EUO-1998-144, *Remove Storage Array STOR-AE-51 from Service*
Drawing S38-V1, *Stack System Diagram, Stack 38, Room 1008*
Drawing S33-V1, *Stack System Diagram, Stack 33*
Drawing S33-V2, *Stack System Diagram, Stack 33*
Drawing S48-V1, *Stack System Diagram, Stack 48*

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Functional Area: MODIFICATIONS (MD)	Core Objective Number: (CO-8)	Date: April 14, 1998

Evolutions/operations witnessed:

None

Discussion:

Six change request packages were reviewed. The review focused on documents affected by the change resulted in the following:

a. Because of their simple nature, most of the changes either did not affect other documents or resulted in a revised drawings. No operating or maintenance procedures were affected.

b. Of the drawings listed in the change request package, all were revised as required to reflect the approved change.

c. None of the six change request packages specified databases that made need to be updated to reflect a change.

d. Procedure Y10-37-036 specifically required that a review for impact on operating procedures be conducted by the responsible process engineer, the operations manager, and the multi-disciplined Change Control Board (CCB), all of which signed the Change Request Approval Sheet. This requirement was met in all the change request packages reviewed as part of this ORR.

Conclusion:

No problems were found in this area, and all of the criteria were satisfied.

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ORR ASSESSMENT FORM

Functional Area: PROCEDURES (PR)	Core Objective Number: (CO-9)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. A process is in place to ensure installed modifications are reflected in procedure revisions.

2. A process is in place to ensure procedure revisions are reviewed for consistency with safety documentation.

Personnel contacted/position:

EUO Procedure Manager
EUO Change Control Administrator
EUO Engineering Manager
EUO/FMO Planning Specialist
Process Engineers

Records & other documents reviewed:

Procedure Y10-102, *Technical Procedure Process Control*
Procedure Y10-135, *Command Media Development*
Procedure Y70-809, *Unreviewed Safety Question Determination*
Procedure Y10-37-032, *Job Performance Aids(JPAs)*
Procedure Y10-37-036, *Configuration Management - Change Control Process*

Evolutions/operations witnessed:

None

Discussion:

Procedures Y10-102, Y10-135, and Y10-37-032 were reviewed to determine if they required procedure revisions to be reviewed for consistency with safety documentation. Procedure Y70-809 required the

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Functional Area: PROCEDURES (PR)	Core Objective Number: (CO-9)	Date: April 11, 1998

USQD screening process to be used for a "temporary or permanent change (revision per Y10-102) to a technical procedure." Procedure Y10-102 required a USQD screen for any change to a procedure. In addition, Procedure Y10-37-032 required a USQD screen for any change to a JPA, and a note before the first step under the section "Plant Procedure Initiation" in Procedure Y10-135 stated that procedure guidance for USQDs could be obtained in Procedure Y70-809. Procedure Y10-37-036 was reviewed to determine if installed modifications were required to be reflected in procedure revisions. It required affected documents (including procedures) to be listed in the change request package for any modification requiring changes to controlled documents, software, operating strategy, training, or organization.

A listing of 103 modifications completed since January 1, 1998, provided by the EUO change control administrator in the form of a change request summary report, was reviewed. Ten of the 103 change request (CR) packages (modifications) required changes to nine procedures and one JPA. The information in the 10 CR packages was compared to the information in the procedure and procedure history files for the nine affected procedures and one affected JPA to ensure the change(s) had been incorporated. No deficiencies were noted in seven of the 10 CR packages. The following deficiencies were noted with the other CR packages:

a. CR No. EUO-95-21 - The summary report listed Procedure Y50-37-98-510 as an affected document. However, there was no evidence in the procedure history file to show this procedure had been changed. The responsible procedure writer said changes were made to JPA-EU-0010. This fact was not reflected in the CR package.

b. CR No. EUO-97-407 - The summary report listed procedure Y50-37-65-527 as an affected document. However, a "Non-Significant Change Record of Decision" in the CR package stated no procedures were impacted by this change. In addition, there was no evidence in the procedure history file to show this procedure had been changed.

c. CR No. EUO-97-561 - The summary report listed Procedure Y50-37-98-663 as an affected document. However, the "Change Verification Form" in the CR package showed there were no affected documents. In addition, there was no evidence in the procedure history file to show this procedure had been changed.

The EUO change control administrator, engineering manager, four process engineers, and an FMO planning specialist were interviewed to assess their understanding of program requirements and responsibilities. Answers to questions were compared to the requirements listed in Procedure Y10-37-036, and no deficiencies were noted. All personnel understood program requirements and their responsibilities.

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Functional Area: PROCEDURES (PR)	Core Objective Number: (CO-9)	Date: April 11, 1998

Conclusion:

Based on the personnel contacted and the records reviewed, a process is in place to ensure installed modifications are reflected in procedure revisions, and procedure revisions are reviewed for consistency with safety documentation. The criteria for this core objective have been met.

Inspected by: J. R. Sprenkle W. E. Hill	Approved by: [signature] ORR Team Manager Date: 4/14/98

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Form 1

ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-10)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. OSR-required surveillance procedures are approved.
2. OSR-required surveillance procedures are current.
3. Future OSR-required surveillances are scheduled.
4. Preventive maintenance (PM) and calibration required to keep systems operable, as defined by OSRs, are identified.
5. PM and calibration required to keep systems operable, as defined by OSRs, are scheduled.
6. Deficiencies in SSC credited for facility safety are identified.
7. Deficiencies in SSC credited for facility safety are categorized.
8. Pre-start deficiencies in SSC credited for facility safety are corrected.
9. SSC credited for facility safety is confirmed to be operable after maintenance.

Personnel contacted/position:

EUO Technical Support Manager
EUO Technical Support Deputy Manager
Building 9212 CSA/CSR Coordinator
Building 9215 Administrative Assistant
EUO/TS Implementation Engineer
Building 9212 Operations Manager
EUO Assessment Manager
Building 9215 Shift Manager
Building 9215 Operations Manager
Building 9212 Shift Technical Advisor
EUO/Technical Support IT&ISS Engineer

ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-10)	Date: April 11, 1998

Records & other documents reviewed:

Y/MA-7345, *Initial Testing & In-Service Surveillance (IT & ISS) Program Description*
Procedure Y10-37-046, *Enriched Uranium Operations Surveillance Program*
Building 9212 OSR Surveillance Schedule Matrix
Building 9212 CSA/CSR Surveillance Schedule Matrix
Building 9215 Complex CSA/CSR/OSR Surveillance Matrix
Building 9212 BIO, Chapter 6, *Operational Controls*
Drawing FTN-P6, *E-Wing Casting Process Systems Diagrams*
E-mail from Uglow regarding *Criteria for Check Valves in Casting Lines*, dated November 24, 1997
Memo from Alley regarding *Check Valves*, dated November 24, 1997
Procedure Y50-37-10-002, *EUO M-Wing Machining*
Y/MA-7333, *Cold Start Plan for EUO Processed-Based Restart*
Y/MA-7255, *The Operational Safety Requirements for Building 9212 EUO Complex*
Y/MA-7291, *The Operational Safety Requirements for the 9215 Complex EUO*
Y/MA-7316, *Operational Readiness Review Plan of Action for EUO Restart Phase A*
Y/MA-7332, *LMES Operational Readiness Review Implementation Plan for the EUO Restart Phase A1 at the Oak Ridge Y-12 Plant*
Draft Procedure Y53-89-ETI-402, *E-Wing Casting Line Check Valve Inspection and Test*
Procedure Y52-37-019, *EUO Fire Safety Inspection*

Evolutions/operations witnessed:

See Core Objective 19.

Discussion:

The recently developed Initial Testing and In-Service Surveillance (IT&ISS) Program Description and Procedure Y10-37-046 were discussed with the technical support manager, deputy manager, and staff. The following were noted:

a. IT&ISS was new as a “distinct” program. Although surveillances and testing had been conducted in the past by various groups (e.g., operations and maintenance), there had been no centralized method for managing and controlling surveillances and tests. The current “owner” was the Technical Support Department.
b. As a result of this new focus, most IT&ISS procedures were new or currently under development. The Program Description was issued in November 1997, had undergone several revisions, and was currently under revision during the ORR.

ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-10)	Date: April 11, 1998

c. Although the Technical Support Department management and staff had a good understanding of the basic requirements for IT&ISS, the methods for implementing these requirements were still somewhat fluid and evolutionary. However, no examples were found where OSR and CSR required surveillance procedures were missing or unscheduled as required.

Through interviews with the Building 9212 and 9215 personnel responsible for coordinating the tracking and scheduling of the surveillance tests and confirmed by inspecting the respective surveillance schedule matrices, it was determined that all CSR and OSR requirements had been added to the surveillance matrices for scheduling and tracking.

The last monthly fire inspection data sheets were reviewed for Buildings 9212 and 9215. The data sheets were completed within the required time frames, and the results were adequately documented. All unsatisfactory items were explained in the comment section. Further, the significant deficiencies were then addressed in EUO's Action Plan attached to the completed data sheets.
As a surveillance test became due, the Building 9212 and 9215 surveillance coordinators issued a report form/cover sheet as per Procedure Y10-37-046, Appendix D. This was the mechanism used by each coordinator to initiate, monitor, and track surveillance test status. The only exceptions to this practice were surveillance performed using the daily round sheets. Daily rounds were initiated, tracked, and controlled by operations. The coordinator did not monitor round sheet status or periodically audit these round sheets to ensure continued compliance to the surveillance program requirements.

An ORR evaluator observed the performance of a Building 9215 Procedure Y50-37-10-002 titled *EUO M-Wing Machining*. Within this procedure, a reference was made to a CSR-MCS-056 requirement to inspect and clean the machine coolant settling tray every two months when machining enriched uranium. The system had been in use using depleted uranium for the last three months. The *Cold Start Plan for EUO Processed-Based Restart*, Y/MA-7333, stated that even though surrogate materials (such as depleted uranium) were to be used during cold operations to test the adequacy of the process to their fullest extent, all procedures and practices pertinent to enriched uranium were to be in place. The ORR evaluator questioned whether this included surveillances. Since no surveillances had been performed within the last three months of operation, the Building 9215 operations manager halted work and evacuated all areas impacted by the machine cooling system for approximately one and a half hours (as would be required for missed surveillances after machining enriched uranium) until a technical and management review of the situation could be completed. A follow up of the incident revealed the following:

a. The February 1998 CSA/SCR Surveillance Report stated that a surveillance was not performed because CSR-MCS-056, Section 4.3.11, did not require a surveillance unless machining was performed on enriched uranium. This condition was also repeated in the surveillance procedure and in the Building 9215 surveillance matrix used for scheduling and tracking surveillances.

b. The Cold Start Plan allowed deviations from treating surrogate material in the same manner as enriched uranium for special situations, provided that this exception was communicated to plant staff through formal means, such as a standing order followed by meetings.

c. The day after the incident, Standing Order #SO-9215-98-004 was issued to all Building 9215 personnel and discussed at various meetings, such as the plan of the day, shift turnover meeting, etc. The standing order stated that "the clean-out activity will not be performed during cold operations but must be performed prior to machining enriched uranium."

An ORR concern existed regarding the timing of the management and technical review and the issuance of the standing order three months after the machine cooling system had been put into operation. This was inconsistent with the requirements in the Cold Start Plan. A follow-up review indicated that no other processes that use surrogate materials during cold operation had missed a surveillance due to a similar oversight. (Finding A1-SV-03)

Per interviews with the responsible technical support personnel, some surveillance procedures did not have comprehensive acceptance criteria. These had been identified and were currently under review.

Post-maintenance test acceptance requirements were informally reviewed by the Technical Support Group to ensure adequacy, but this was not addressed or required in Procedure Y10-30-046.

Prior to the ORR, an issue was raised concerning the surveillance testing of the casting furnace cooling water return check valves. There were both OSR and CSR surveillance requirements for these check valves to ensure that upon loss of cooling water, unintended backflow of water into the furnace cooling water return line did not occur. The check valves were replaced in November 1997 with ones that were shop calibrated to leakage rates of equal to or less than 1.0 standard atmosphere cc/sec at a backpressure of 10 psig. Subsequently, additional concerns were expressed regarding the validity of swing-check valve leakage testing at a single, relatively high, backpressure test point. It was acknowledged by plant technical staff that the greatest leakage could occur at the lower back pressures, because of the design and the inherent nature of swing-check valves. Accordingly, new acceptance criteria had been developed and received technical review and approval. However, the procedure to incorporate the new acceptance criteria and leak test these valves annually over a range of back pressures was in draft. Until this procedure was issued and the check valves were retested, the plant had not demonstrated that these check valves had met their intended OSR and CSR functions. However, during this ORR, casting furnace C and the cooling water return line check valve were put into operation. (Finding A1-SV-01)

ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-10)	Date: April 11, 1998

Conclusion:

The surveillance program meets all of the criteria with the exception of a missed surveillance test of the machine cooling settling trays (Finding A1-SV-03) and the practice of not recording the as-found condition, specifically the casting furnace cooling water check valves as discussed in Finding A1-SV-01. If Procedure Y10-37-046 was upgraded to prevent these recurrences, then all of the criteria will have been met.

Inspected by: George P. Zagursky	Approved by: [signature] ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-11)	Date: March 11, 1998

Method of Appraisal (short narrative description):

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

Criterion:

Instruments that monitor OSR requirements are calibrated.

Personnel contacted/position:

EUO PM Coordinator
EUO IT&ISS Engineer
EUO Technical Support Deputy Manager

Records & other documents reviewed:

Procedure Y10-039, *Field Calibration Program*
Procedure Y60-121, *Calibration and Control of Measuring and Test Equipment (M&TE)*
Access printout titled *SR Required M&TE Sorted By Procedure*
Study titled *Procedures as Listed on Building 9212 OSR Surveillance Schedule Tabulation Preventive Maintenance Recall Plan of Action*
Internal correspondence memo from Jessen to all EUO personnel, dated 3/5/98, titled *EUO MSA Deficiency #ER-30-98-001*
Y/MA-7244, *EUO Process-Based Restart Schedule Activity Completion Descriptions*
White Paper titled *Measuring and Test Equipment (M&TE) Processes*
White Paper titled *Training of Calibration Personnel*
Access report titled *SR Required M&TE Sorted by Resp Dept*
Access report titled *SR Required M&TE Sorted by Procedure*

Evolutions/operations witnessed:

None

ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-11)	Date: March 11, 1998

Discussion:

As part of the Process-Based Restart (PBR) effort, a multi-disciplined team walked down each system to accomplish the following:

a. Determine what would be in the Measuring and Test Equipment (M&TE) and preventive maintenance (PM) program based on the authorization basis (OSR/CSR) requirements.

b. Determine appropriate frequencies, acceptance criteria, and required accuracy levels.

c. Determine which procedures needed to be upgraded or developed to include this information.

The results of this effort formed the basis for the current PM and M&TE processes. Form #2290 from Y/MA-7244 was the method to record this information and ensure that the basis for equipment inclusions into the program were properly documented. A sample review of procedures and confirmed by interviews with the PM and EUO technical support personnel, resulted in a concern regarding the lack of a requirement to test and record the "as-found" condition during M&TE and surveillance testing. Recording the as-found condition and comparing it to the acceptance criteria was necessary for identifying equipment operability, equipment degradation, and the acceptability of the testing frequency. (Finding A1-SV-02)

Recently, a detailed review of each surveillance test procedure was conducted by Technical Support Group in order to upgrade the Surveillance Test Program by ensuring completeness and consistency. Included in this effort was the identification of test equipment, special tools, and protective equipment. Once identified, the Technical Support Group ensured that approved calibration procedures existed or were developed, as needed. This effort was extensive and thorough. However, the focus was on OSR requirements only. Although some coincident overlap with CSR requirements occurred, no similar effort had been performed to ensure all of the necessary test equipment and tools needed for CSR-related surveillance tests were identified and controlled by approved calibration procedures. (Finding A1-SV-04)

ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-11)	Date: March 11, 1998

Conclusion:

Safety systems and other instruments that monitor OSR requirements are calibrated as required by the ORR criteria. However, test equipment and tools that are necessary for conducting CSR requirements have not been fully identified and calibrated as discussed in Finding A1-SV-04. Also, the as-found condition of the casting furnace cooling water check valves were not recorded as discussed in Finding A1-SV-04.

Inspected by: G. P. Zagursky	Approved by: [signature] ORR Team Manager Date: 4/14/98

Form 1

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ORR ASSESSMENT FORM

Functional Area: SURVEILLANCES (SV)	Core Objective Number: (CO-12)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criterion:

Systems credited for facility safety will be operable as defined.

Personnel contacted/position:

Records & other documents reviewed:

Evolutions/operations witnessed:

Discussion:

COs 10 and 11 address this Core Objective.

Conclusion:

Inspected by: George P. Zagursky	Approved by: [signature] ORR Team Manager Date: 4/12/98

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ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-13)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criterion:

> Operations personnel whose actions or decisions may directly impact the safety envelope must have training and qualification requirements documented in an EUO training and qualification program description.

Personnel contacted/position:

EUO Training Department Manager
Chemical Process and Recovery Trainer
Training Team Leader for Metal Production
General Area Operators
General Area Operator Operational Evaluators
EUO Division Training Manager
9215 Operations Manager

Records & other documents reviewed:

Y/MA-7316, *ORR POA for EUO Restart Phase A1*
Y/MA-7322, *9212 and 9215 Chemical and Metal Processing Minimum Staffing and Production Staffing Requirements*
Y/MA-7278, *EUO PBR Qualification Areas and Process Assignments*
Training and Qualification Program Descriptions

Evolutions/operations witnessed:

None

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-13)	Date: April 14, 1998

Discussion:

The correlation between the positions listed in Table 3 of Y/MA-7316 and the positions listed in Y/MA-7322 was discussed with the EUO training department manager and the chemical process and recovery trainer to determine the training requirements for these positions. Y/MA-7278 and an informal document helped clarify the relationship between the various position titles.

The *Training and Qualification Program Descriptions* for the following EUO operations positions in Table 3 of Y/MA-7316 were reviewed:

a. chemical operator supervisor (fissionable material handler (FMH) supervisor)

b. chemical operator (FMH)

c. shift manager

d. production manager

e. shift technical advisor

f. material handling supervisor

g. machinist supervisor

h. chemical operator (non FMH)

i. material controller

j. material clerk

k. SNM vehicle driver

l. machinist

m. machine cleaner

n. technical staff

These were the positions that impacted the safety envelope at EUO facilities. Additional management positions were addressed in CO-23 and support staff positions were addressed in CO-35 and CO-36.

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-13)	Date: April 14, 1998

Control manipulations had not been identified in the TQPDs for any of the certified positions, as required by DOE Order 5480.20A. EUO restricted the scope of control manipulations to only those that could result in a nuclear criticality accident if improperly performed. The DOE Order defined control manipulations to also include manipulations of an apparatus or a mechanism that could impact the chemical, physical, and metallurgical processes of a facility in such a manner as to affect the protection of health and safety. Control manipulations should be normally derived from the tasks selected for continuing training. (Finding A1-TQ-05)

The requirements that were specified in the EUO Training and Qualification Program description (TQPD) for the individual positions did not reflect Order requirements in all cases. The following problems were noted (Finding A1-TQ-02):

a. The education requirements specified in the TQPD for shift and production managers was a high school diploma or equivalent. The Order required managers to have a B.S. degree or equivalent.

b. The TQPD required that certified supervisors complete a comprehensive written examination and an oral board to achieve certification and recertification. DOE Order 5480.20A required a comprehensive written examination, an oral examination, and an operational evaluation (the oral examination and operational evaluation may be combined).

c. DOE Order 5480.20A I.7.d(3)(a) required that certified operators and certified supervisors receive annual training and examination on abnormal and emergency procedures. Item 10 of Appendix 4 of Y/GA-66/R6, *Y-12 Plant Training Implementation Matrix for DOE 5480.20A Standards/Requirements Identification Document*, indicated that this requirement would be met and referenced Sections 2.3 and 4.4 of the *Conduct of Training Manual*. The *Conduct of Training Manual* did not specifically address this requirement in the referenced sections nor did the TQPD for any of the certified positions for Phase A1.

The initial training and qualification requirements for technical staff positions were specified on Engineering and Technical Staff Qualification Requirements Data Forms (see CO-23 for a discussion on the content of these forms.) In most cases, the attached TMS Requirement/Qualification Status Reports and rosters indicated that the required training had been completed and verified. However, for some of the Design Support personnel, completion of the Building 9212/9215 BIO/OSR training was not documented in the individual's record. Also some of the design support personnel were not required to have this training, even though they had been assigned to the facility. The EUO training manager provided an updated organization chart that indicated only two of these individuals were still assigned to the facility. These two individuals were required to have, and had received, the Building 9212/9215 BIO/OSR review.

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-13)	Date: April 14, 1998

Most of the technical staff positions maintained currency on the safety basis documentation as part of their normal work activities, their qualification as USQ reviewers, and other responsibilities.

Conclusion:

The training and qualification of operations personnel whose actions and decisions directly impact the safety envelope were documented in an EUO training and qualification program description or a similar document. Some DOE Order 5480.20A requirements for education, control manipulations, operational evaluations, and annual training on abnormal and emergency procedures were not met, but do not require resolution before resumption. The criterion for this core objective has been met.

Inspected by: T. L. Betz C. K. Stalnaker	Approved by: [signature] ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-14)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Operations personnel (including the EUO organization manager and the nuclear operations manager) whose actions or decisions may directly impact the safety envelope, satisfy the technical qualification requirements of DOE Order 5480.20A, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*.

2. Technical qualifications for operations personnel are documented in an EUO training and qualification program description.

3. Records show that operations personnel meet the requirements of the EUO training and qualification program description or that an approved compensatory action is in place.

Personnel contacted/position:

EUO Training Manager
Chemical Process and Recovery Trainers
Training Team Leader for Metal Production
Training Records Clerks
General Area Operators
General Area Operator Operational Evaluators
Building 9215 Operations Manager

Records & other documents reviewed:

Y/MA-7316, *ORR POA for EUO Restart Phase A1*
Y/MA-7322, *9212 and 9215 Chemical and Metal Processing Minimum Staffing and Production Staffing Requirements*
Training and Qualification Program Descriptions
Individual Training Records
Conduct of Training Manual
TMS-18223, *Operational Evaluation - General Area Operator*
Y/MA-7278, *EUO PBR Qualification Areas and Process Assignments*

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-14)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Operations personnel (including the EUO organization manager and the nuclear operations manager) whose actions or decisions may directly impact the safety envelope, satisfy the technical qualification requirements of DOE Order 5480.20A, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*.

2. Technical qualifications for operations personnel are documented in an EUO training and qualification program description.

3. Records show that operations personnel meet the requirements of the EUO training and qualification program description or that an approved compensatory action is in place.

Personnel contacted/position:

EUO Training Manager
Chemical Process and Recovery Trainers
Training Team Leader for Metal Production
Training Records Clerks
General Area Operators
General Area Operator Operational Evaluators
Building 9215 Operations Manager

Records & other documents reviewed:

Y/MA-7316, *ORR POA for EUO Restart Phase A1*
Y/MA-7322, *9212 and 9215 Chemical and Metal Processing Minimum Staffing and Production Staffing Requirements*
Training and Qualification Program Descriptions
Individual Training Records
Conduct of Training Manual
TMS-18223, *Operational Evaluation - General Area Operator*
Y/MA-7278, *EUO PBR Qualification Areas and Process Assignments*

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-14)	Date: April 14, 1998

Y/MA-7354, *General Area Operator: Approved On-The-Job Trainers/Evaluators/Operational Evaluators*
Y50-37-032, *Measurement Control for Scales*

Evolutions/operations witnessed:

Two operational evaluations of general area operators

Discussion:

Two general area operator (GAO) operational evaluations were conducted by different evaluators (Evaluator A and Evaluator B). Evaluation criteria and results were recorded on TMS-18223 checklist. The checklist contained evaluation instructions in Section I, a knowledge assessment in Section II, and a performance assessment in Section III. In total, Sections II and III contained 18 criteria. The following problems existed:

a. The Y-12 Training and Qualification Program Description included requirements for GAO assessments, including the operational evaluation. This Program Description specified seven mandatory topics for inclusion in the operational verification. Two of these topics (facility layout and organizational awareness) were not specifically covered by any of the 18 activities on the checklist.

b. Evaluation instructions required the evaluation to be "conducted by a technically competent member of the EUO at the shift supervisor level or higher," and that evaluators be trained in accordance with Chapter 5.4 of the *Conduct of Training Manual*. Neither evaluator was a shift supervisor (or higher) nor a member of EUO. Instead, both were employees of the LMES Center for Continuing Education (CCE). When asked, one evaluator said supervisors did not generally have time to perform operator evaluations, and CCE had been asked to do much of this work. The Building 9215 operations manager said about 50 GAO evaluations had been performed by CCE personnel, including almost all recent evaluations. The manager said he was confident of the ability of the CCE evaluators, because both had worked as operators and one had been a supervisor in EUO several years prior. He said the EUO training manager approved their qualifications after completing all required courses.

   Following appointment by the applicable operations manager, the Program Description assigned responsibility for verification of approved personnel performing the operational evaluation to the EUO training manager. Although neither evaluator met the requirements listed on the evaluation checklist, both were listed on Y/MA-7354. Both had been added to the list on

March 2, 1998. When asked, Evaluator B said he had been conducting GAO operational evaluations for two-to-three months prior to March 1998.

Training records for Evaluators A and B were reviewed. No EUO record of qualification existed for either evaluator. CCE training files for the evaluators were reviewed with similar results. Although certain training modules needed for qualification were in the files, no qualification of technical competency approved by EUO existed. TMS records for both evaluators showed them as qualified to be operational evaluators, but neither EUO nor CCE could produce documentation to support the TMS entry.

When asked, the EUO training manager said qualification requirements listed on TMS-18223 were inconsistent with requirements used to develop Y/MA-7354. She said it was not the intent to use CCE personnel to conduct GAO operational evaluations. Future operational evaluations scheduled for performance by the CCE representatives were canceled. Subsequently, the training manager said CCE personnel had performed nine additional operational evaluations for higher-level certified operator positions (e.g., casting operator). The training manager said these evaluations would be repeated using qualified EUO personnel.

c. Evaluation instructions specified the evaluation be conducted "in the part(s) of the facility where the trainee typically conducts these activities." During both observed evaluations, the operators indicated they were unfamiliar with one or more of the areas or pieces of equipment included. Evaluator A told one operator to assume he was in E-Wing although that part of the evaluation was performed in the C-1 Wing. One of the activities classified as "critical" on the checklist was checkweighing an accountability scale. Neither operator had used a scale like the one used for the evaluation. One operator said he had only used an accountability scale once before, seven weeks prior, in a training class.

Each performance activity in Section III of the checklist was specified to be performed (P), or either performed or simulated (P/S). Evaluation instructions required activities coded "P" to be performed unless the EUO operations manager approved simulation. Such exceptions were to be initialed, dated, and explained in the checklist by the operations manager. Completing a round sheet and checkweighing an accountability scale in accordance with Y50-37-032 were coded "P". Evaluator A did not require the first operator to complete the roundsheet, and Evaluator B did not require the second operator to record results on the checkweighing form in Y50-37-032. Operations manager approval was not obtained in either case.

The Section II knowledge assessment did not list criteria on which to evaluate satisfactory/ unsatisfactory responses. Instead, the evaluators were to document the specific areas or questions asked for each of the 12 activities on the checklist. In some cases, "what to look for/what to do" had been entered instead of specific questions (e.g., What would you do if you found condition "X"?) For an item intended to measure the operator's knowledge of reporting structure, "crit. safety, stop work, shift supervisor" were entered with no further explanation.

Neither evaluator completed the evaluation checklist as the evaluation progressed. When asked, both evaluators said they would complete the checklist following completion of the evaluation. Relying on memory to complete a document used to support operator certification may lead to errors and is a questionable practice. On one evaluation checklist, the evaluator was to enter the serial number of the accountability scale used during the evaluation. Review of the checklist after its submittal to the EUO training coordinator revealed this information had not been recorded.

Procedure Y50-37-032 was designated Category II. Step VI.A.4 required the operator to ensure the top portion of the form used to record results was completed, including data such as the M-number of the checkweight set. One operator entered the M-numbers of two sets of checkweights, although only one set was used.

Section VI.A.2 of Y50-37-032 required the operator to clean the scale platform using an "approved" cleaner. The procedure did not define an approved cleaner. The operators used bottles of 409 found on the test weight wagon.

Step VI.A.7a of Y50-37-032 specified placement of test weights in the "center" of the scale platform. For the 15 kg test weight, three 5-kg weights were used. One operator stacked the three weights, while the other placed them adjacent to each other. When asked, Evaluator B said stacking was the correct method. Step VI.A.6 required the operator to zero the scale. Step VII.A.7 specified a series of five test weights be used to check the scale. Although not specified, the operator assigned to Evaluator A removed the test weight from the scale platform and re-zeroed the scale after each individual test weigh. The evaluation form completed by both Evaluator A and B showed no deficiencies in scale use.

When asked, Evaluator B said there was only one version of the GAO operational evaluation checklist. Use of the same evaluation for all GAOs (over 100 in number) was questionable and might compromise test integrity over time.

At the conclusion of the evaluation, Evaluator B and the associated operator were asked if the operator could checkweigh accountability scales following GAO certification. Both said no, that job-specific training would be required on scales in the assigned area of 9212/9215/9206 before a certified GAO could checkweigh accountability scales independently. According to the GAO Training and Qualification Program Description, a GAO would be able to checkweigh scales upon certification. When asked, the 9215 operations manager said GAOs could check weigh scales, but were not normally asked to do so. (Finding A1-TQ-04)

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-14)	Date: April 14, 1998

d. Operational evaluations were repeated for the nine persons in certified positions originally evaluated by CCE personnel (see "b" above) and all passed. These evaluations were performed between March 9 and March 18, 1998. During the period prior to the evaluation, no restrictions were imposed on the activities of any of the nine workers.

The Performance Assessment section of each operational evaluation record specified certain actions to be performed, while others could be either performed or simulated. For actions to be performed, the operations manager authorized lowering the requirement to simulation, because "equipment was not available." The following table summarizes actions taken for each involved certified position:

Certified Position	Number of Actions to be "Performed"	Number of Actions Actually Performed
Pack and Ship Operator	3	0
Chip Processing Operator	2	0
Casting Support Operator	3	2
Casting Operator	4	0

The operational evaluations were approved based on simulations of activities such as pickling, press operation, disassembly of a furnace stack assembly, and starting a casting furnace. When asked, training department representatives said these were only provisional qualification, and that another evaluation would be performed of each person when normal operations resumed.

The level of detail on one of the evaluation forms was so limited that the types of questions used to assess operator knowledge could not be determined. (Find A1-TQ-09)

TMS-18223 records of operational evaluations performed by EUO supervisors/managers during 1997 were reviewed for level of detail. Some contained specific questions used to determine level of knowledge. Others contained very little detail, and were similar to those completed by the CCE evaluators.

EUO training records clerks indicated they were the ones who entered records into the computer site-wide Training Management System. They said records were entered into the system as soon as possible after records were received. For an individual record, the final approval date was used to indicate the official qualification or certification date even if the entry was made later than that date. The requirements for records were specified in the *Conduct of Training Manual*, Section 7.3.

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-14)	Date: April 14, 1998

A detailed review of various individual training records was completed. This was made difficult because the records required for certification and qualification were not separated from other training records and all records were filed in chronological order. Determination of requirements for qualification and certification required a printout from the TMS.

The records contained various types of written examination records such as answer sheets, printout of computer-generated answer sheets, examination cover sheets, and entire graded comprehensive examinations. Except for the comprehensive written examinations, these examination records did not contain graded written examinations (with answers corrected as necessary or examination keys) as required by DOE Order 5480.20A, Section I.15.a.(2). In instances where just the cover sheet for the examination was provided, the examination questions and answer sheets were maintained in the training program records. In this case, it could not be determined which questions the individual missed, only what the examination grade was. (Finding A1-TQ-03)

The *Conduct of Training Manual*, Section 4.3, required individuals who administered PDCs to have received training and be qualified as on-the-job trainers and/or evaluators. Individuals were to be trained on the principles of conducting on-the-job training and/or evaluation and be technically qualified for the positions for which they conducted on-the-job training and/or evaluation. The completion of this training and qualification was documented by placing the individual's name on the approved on-the-job trainer/evaluator list. Instructor Qualification record forms were placed in the instructor training record files for those individuals not holding a current qualification/ certification for the position at the facility and in the individual training records for those individuals holding a current qualification/certification for the position at the facility.

The records reviewed indicated that some individuals who were conducting on-the-job training/evaluation were not on the approved list. In other cases, on-the-job trainers/evaluators were conducting on-the-job training/evaluation prior to the date they were officially qualified or they were not qualified to conduct on-the-job training/evaluation for that specific position. (Finding A1-TQ-04)

Other problems noted were as follows:

a. Records personnel used a stamp to indicate when the record was entered into the TMS. In some cases, this date was prior to the date the particular document (exam, PDC, qualification/ certification endorsement form, etc.) was dated as completed.

b. All documentation of qualification (comprehensive written examination) was not available in one of the records.

c. Examination grades were changed with no indication as to why the grade was changed.

See CO-13 for additional discussion on compliance with DOE 5480.20A.

The M-Wing supervisor was a "qualified" position that supervised machine coolant operators, a "certified" position. DOE Order 5480.20A required immediate supervisors of certified personnel to be certified. (Finding A1-TQ-01)

Conclusion:

Except as noted in CO-13, the technical qualification requirements for DOE Order 5480.20A were met. Weaknesses in the planning, implementation, and management of operational evaluations compromised the integrity of the EUO qualification program. When actions needed to close the prestart findings are complete, the criteria for this core objective will be met.

Inspected by: C. K. Stalnaker T. L. Betz	Approved by: [signature] ORR Team Manager Date: 4/14/98

ORR ASSESSMENT FORM

Functional Area: MODIFICATIONS (MD)	Core Objective Number: (CO-15)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Training materials and activities associated with modifications are consistent with operating procedures.

2. Modification packages for approved modifications to processes are reviewed for impact on training requirements.

3. A change control process is in place to ensure that future modifications are reviewed for impact on training requirements.

Personnel contacted/position:

Configuration Management Change Administrator
EUO Technical Support Deputy Manager
EUO Engineering Manager

Records & other documents reviewed:

Procedure Y10-37-036, *Configuration Management - Change Control Process*
Change Request #EUO-1998-088, *Temporary Caulking for Filter Housing*
Change Request #EUO-1998-087, *Changes for Stack 38 Filter House, Ductwork & Fan*
Change Request #EUO-1998-126, *Connect Argon Vent Line to S38 Ductwork*
Change Request #EUO-1998-144, *Remove Storage Array STOR-DE-51 from Service*
Change Request #EUO-97-547, *Process Condensate Recirculation Pumps and Transfer Pump Design*
Change Request #EUO-1998-123, *Install Base Radio Station in 9212 Shift Manager's Office*

Evolutions/operations witnessed:

None

ORR ASSESSMENT FORM

Functional Area: MODIFICATIONS (MD)	Core Objective Number: (CO-15)	Date: April 14, 1998

Discussion:

Procedure Y10-37-036 was reviewed to ensure that the change request packages were reviewed for impact on training requirements. The change control procedure addressed training requirements in several sections (e.g., Section 6, Step 4, and Appendix G). This procedure was very specific regarding the impact on training. For example, it was a requirement that the Technical Support Department personnel coordinate the development of training modules with the EUO Training Department personn and that training be conducted and tracked to completion prior to releasing the modified system for operation. Accordingly, the change control procedure was found to be satisfactory in this area.

None of the change request packages reviewed during this ORR affected operating procedures. Therefore, training material associated with modifications were not reviewed to ensure consistency wit operating procedures, and no training requirements were identified and completed prior to declaring the modified systems operable.

Conclusion:

No problems were found in this area and all of the criteria were satisfied.

Inspected by: G. P. Zagursky	Approved by: [signature] ORR Team Manager Date: 4/14/98

Form 1

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ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-16)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. New or revised operating procedures have been reviewed for training implications.

2. Affected operations personnel have been trained, as required, in accordance with the *Nuclear Operations Conduct of Training Manual* before using a procedure.

Personnel contacted/position:

EUO Training Instructor
EUO Training Developer
PCO Training Instructor
PCO Training Manager
Machinists
Dimensional Inspectors
Radiological Control Supervisor
FMO Training Manager
FMO Maintenance Workers
Y-12 Plant Training Manager
EUO Training Clerks
EUO Training Manager
EUO Training Coordinator

Records & other documents reviewed:

Lesson Plan #13600, *Basic Machinist Training*
Nuclear Operations Conduct of Operations Manual
Lesson Plan #14772, [Product Certification Organization] *General Nuclear Criticality Safety Requirements*
Procedure Use Exercise for TMS Module 14772
Nuclear Operations Conduct of Training Manual
Lesson Plan #12095, [Facility Management Organization] *9212 Dry Vacuum*

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-16)	Date: April 14, 1998

Lesson Plan #12094, [Facility Management Organization] *9212 Casting Furnace*
Records of Training Configuration Management Review

Evolutions/operations witnessed:

Basic machinist training class for M- and O-Wing machinists
General nuclear criticality safety training class for Product Certification Organization dimensional inspectors
9212 safety system training class for Facility Management Organization maintenance personnel

Discussion:

A basic machinist training class was observed. Seven machinists attended the classroom training, which was conducted in a facility that was well lighted, had acceptable visual aids, was quiet, and generally conducive to training.

The instructor provided training using Lesson Plan #13600. The instructor exhibited a good working knowledge of machining principles and was able to answer all technical questions asked. He taught in a manner that encouraged student participation and made effective use of visual aids to demonstrate the effect of bulk defects and hydrogen embrittlement.

Six of the seven students actively responded to questions from the instructor. Students did not always return promptly from breaks. In two of three breaks, class resumed with one or two students missing. Tardy students arrived within five minutes in both cases.

The training instructor used the lesson plan and overhead transparencies to present material. The lesson plan was dated February 9, 1998. However, overhead transparencies were dated November 17, 1997. When asked, a training developer said the transparencies were not affected by the revision to the lesson plan. However, the following inconsistencies existed:

a. The lesson plan identified "uranium hydrides" as a potential source of hydrogen embrittlement of uranium. The overhead cited methane gas, but not hydrides, as a source.

b. The overhead listed rounds responsibilities for supervisory personnel including personally conducting tours and random inspections. The instructor discussed this responsibility several minutes. The lesson plan did not include or describe these responsibilities.

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-16)	Date: April 14, 1998

c. The overhead described, and the instructor discussed, the requirement for machinists to initiate corrective action for deficiencies found on rounds. The lesson plan only described machinist responsibility to report deficiencies to supervision.

d. The lesson plan and overhead specified review of equipment status boards by machinists planning to conduct rounds. However, discussion between the machinists and instructor concluded that review of these boards was not required before performing rounds. When contacted, the subject matter expert said the shift manager reviewed boards in the daily facility brief so machinists no longer needed to check status boards before doing rounds.

e. An overhead titled *Radiological Controls* indicated radiological material must be controlled to prevent a criticality accident. The lesson plan cited only the prevention of contamination and its spread as reasons for control.

The instructor described the use of compensatory measures, such as LO/TO or barrier erection, by machinists when they encountered dangerous or hazardous conditions. One machinist said some of the described compensatory actions could not be performed using the RWP for machinist rounds, which only required a lab coat and two pairs of surgeon's gloves The instructor suggested that machinists performing rounds should sign on the rounds RWP but should dress out in accordance with a more restrictive RWP so they could take any needed compensatory action. When asked, Building 9215 RADCON supervision stated that no request had been received from 9215 management to upgrade the protective requirements for machinists performing rounds.

Each student was provided a copy of both the transparencies and the instructor's lesson plan. When asked, the instructor said students had requested the lesson plan. The instructor used the lesson plan instead of the overheads to lead discussion of certain topics. In one example, overhead No. 29 was left on the screen while the instructor used the lesson plan to describe activities covered in overheads Nos. 30 through 38.

The *Nuclear Operations Conduct of Operations Manual,* Chapter 2.1, Round Sheet Preparation and Use, specified that personnel performing rounds must continuously be alert for fire hazards, smoke or unusual odors, improper storage of flammable materials, oil and grease spills, improper radiological barriers, water and steam leaks, etc. None of these requirements were included in the training. Instead, machinists were encouraged to be "thorough and methodical" when performing rounds.

The lesson plan specified that the instructor ask students what leads to foreign particles and gas pockets in metal and to list responses on the board. These questions were asked, and answers discussed, but no lists were generated.

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Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-16)	Date: April 14, 1998

Four types of bulk defects were described in the lesson plan, but only three were discussed. The instructor said the fourth defect - welding defects - did not apply to EUO, although the lesson plan was specific to M- and O-Wing machinists and supervisors. When asked, the subject matter expert said he saw no need to have welding defects in the lesson plan.

A general nuclear criticality safety class for 12 product certification organization (PCO) dimensional inspectors was observed. The class was scheduled to begin at 0800. The instructor arrived at 0758 and found four students present. He began class at 0810, but was interrupted by a student who said other inspectors were coming. Between 0812 and 0818, eight additional inspectors arrived.

The instructor reminded students they were supposed to have signed in on the Building 9215 accountability log. Four students excused themselves to sign in. The training room was well equipped with adequate student accommodations. The instructor explained the class was to train PCO personnel on Y70-55-002, *(PCO) General Nuclear Safety Requirements*. The instructor used the lecture method of presentation during the two-hour class, reading each of approximately 45 transparencies. He did not ask students for questions, and did not teach in a style that invited student participation.

The instructor said the training was the middle class in a series of five related to NCS. When one student said he had not had one of the previous courses in the series, General NCS taught by the Center for Continuing Education, the instructor said he should be trained on that course very soon. The student remained in the class, but asked questions (e.g., "What does a red-lined CSA mean?") that demonstrated his lack of familiarity with information presumed to be understood by attendees.

Students were provided a copy of Y70-55-002 for use during the class. The instructor used lesson plan module 14772 to conduct training. Certain activities outlined in the lesson plan were not performed. Examples included the following:

a. review of building evacuation routes

b. review of anticipated number of breaks

c. encourage students to ask questions

No visual aides were used to demonstrate and explain NCS-related topics such as boundary markings, the meaning of nested arrays, typical problems with arrays and storage containers, etc. The inspectors were told the CSA-related roles of the PCO department manager, procedures manager, document management center, etc., but were not informed of how to deal with situations they were likely to encounter when using CSAs (e.g., how to handle a lost CSA, missing CSA manual, questions about changes to CSAs, etc.).

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-16)	Date: April 14, 1998

The lesson plan instructed workers to notify NCSO and the shift manager of any abnormal NCS situation. However, Y70-150, *[Y-12] Nuclear Criticality Safety Program,* specified NCSO and the facility operations manager be contacted. The lesson plan indicated that corrective actions directed by the shift manager could be performed. Y70-150 specified that corrective actions could be directed by the operations shift technical advisor (within limits), but did not acknowledge use of the shift manager.

At the end of the lecture, an open-book procedure use exercise (PUE) was administered. When asked, the Y-12 plant training manager said there were no published Y-12 requirements for construction of PUEs. The PUE did not follow good practices for test construction. The following were examples:

a. Undefined acronyms were used.

b. No instructions were provided on the PUE on how to complete items, or that there was only one correct answer to each question.

c. Like-items (multiple choice, true-false, completion) were not grouped.

d. Both three-alternative and four-alternative multiple choice items were included.

e. There were no questions on how to respond to abnormal NCS conditions.

The instructor provided students a course/instructor evaluation form at the conclusion of the class.

Facility Management Organization (FMO) training of seven qualified position maintenance personnel working on or around 9212 safety systems was observed. Training was conducted in a classroom that was adequately equipped with supplies, visual aides, and student accommodations. The FMO training manager conducted the training using Lesson Plans 12095 and 12094. The training was a requirement for EUO maintenance group qualified positions.

Lesson plan 12095 was concise and focused on the function of the 9212 dry vacuum system. Each safety system (differential pressure switch, level detectors, and sprinkler interlock) were described and their functions explained. The instructor taught in a manner that induced frequent student questions. Overhead viewgraphs were professional, colorful, and not crowded with excess information. The instructor effectively supplemented each viewgraph with appropriate information. The instructor summarized important information at the end of the lesson. A 15-question True-False exam was administered. The questions were of appropriate difficulty and required attentiveness during class to answer.

Module 12094 was presented in a similar manner. The overhead viewgraphs were professionally designed but colored differently than those used in Module 12095, enhancing visual appeal and effectiveness. The overall quality of the lesson plan and training delivery was equal to that of Module 12095.

The lesson plan for Module 12095 had the incorrect title and module number on page two. Three black-and-white viewgraphs of system schematics were hard to read, and one was noticeably faded. One student arrived 25 minutes after training started, but was allowed to remain in class. When asked, the instructor said the worker passed the exam by a narrow margin.

Twelve procedures were picked at random from lesson plans and exams used for persons in certified positions. EUO training provided the "Training Configuration Management Review Sheet" (Review Sheet) for each procedure. This sheet was a requirement of Section 6.3 of the *Y-12 Nuclear Operations Conduct of Training Manual*. The manual also required all procedure changes to be reviewed for training impact.

The following lists results from review of the 12 Review Sheets:

a. None of the 12 required training prior to the associated procedure becoming effective.

b. None of the 12 indicated modifications to existing training materials were required.

c. None of the 12 indicated the procedure revision affected a training and qualification program.

Six of the revised procedures were reviewed. Changes to the procedures were as follows:

a. Y50-37-92-503, *Headhouse Fan Room Wet Vacuum Normal Operations*, included changes to steps that implemented CSR requirements, made valve manipulations, and required pressure readings.

b. Y50-37-036, *Generic Wet Vacuum Trap Normal Operations*, included changes to steps for starting up and shutting down the wet vacuum final trap.

c. Y50-37-20-002, *Billet Salt Bath Operation*, added a new section for pre-operational checks of the billet salt bath hoist.

d. Y50-37-20-061, *Adding and Removing Salt from Salt Bath Liners*, was a new Category II procedure for pumping salt from 9215 O-Wing salt bath liners and adding salt to operating salt baths. The procedure included some steps that required check-offs when performed.

e. Y50-37-20-062, *Salt Bath Startup*, was a new Category II procedure written to start up salt baths to support 9215 O-Wing rolling and forming. The procedure included LO/TO requirements for stinger installation and removal and precautions against overheating bath electrodes and against allowing moisture in the salt baths.

f. Y57-37-92-003, *Headhouse Fan Room Wet Vacuum System Alarm Response*, changed from a Category III to Category II procedure.

When asked, the EUO training manager said Review Sheets were only used to assess training needs that were to be provided by EUO training. When training on procedures was to be accomplished with supervisor reviews during crew briefs or with required reading, there was no documentation made on the Review Sheets.

Examples of Review Sheets that required training were requested. Five procedures, all emergency operating procedures, were provided by EUO training. The following results came from review of these sheets:

a. All five required training "prior to effectivity (minimum staffing)." When asked, the training coordinator said this meant at least the number of persons required to meet minimum staffing requirements had to be trained prior to the procedure's effective date.

b. All five required revision of "the appropriate lesson plan materials" to include the emergency operating procedure. However, none of the Review Sheets specified which lesson plans were impacted.

Training records for one of the procedures, Y55-37-001, *Response to Fires Involving Uranium Chips and Fires*, were reviewed. The procedure was effective March 26, 1998. Training was conducted on March 25, 1998, and April 1, 1998. When asked why some of the personnel were not trained until April 1, 1998, after the effective date, the trainer said eight employees, including an M-Wing supervisor, were not available on March 25, 1998. When the involved supervisor was asked, he said those persons not receiving the training on March 25, 1998, were assigned normal job activities prior to being trained on April 1, 1998. When asked, the EUO training manager said work assignments of the eight persons were supposed to have been restricted so they did not work independently in a qualified position until training was completed. (Finding A1-TQ-07)

When asked, the person responsible for developing the lesson plan for the required training said it had not yet been developed. When asked, the trainer who conducted the training said it was completed during a shift briefing by reading the procedure line-by-line. He said that no comments or objections to procedure content were received from managers or workers attending the training. However, during a debrief held following a drill in M-Wing that utilized the procedure, workers and management objected to Step 2[1] of the procedure, which required the machinist to first call 911 or pull a Gamewell box before attempting to put out a chip fire.

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-16)	Date: April 14, 1998

The *Y-12 Nuclear Operations Conduct of Training Manual* required line manager approval of the Review Sheet when any training materials had to be changed or when training had to be performed. For all five of the above Review Sheets, "Bill Altman per telecon" was printed in the signature line. This individual was not a line manager in EUO.

Although line managers were required to approve decisions by EUO training when training was required, there was no requirement for line management approval of "no training required" decisions. None of the 12 Review Sheets that did not require training had been approved by line management.

The EUO training manager was assigned responsibility to sign the Review Sheet documenting either concurrence or disagreement with the recommendations for training. On the five Review Sheets, the same person who signed as the "cognizant training individual" also signed as the Training Manager, eliminating independent review of the training decision. When asked, the training manager said she had delegated signature responsibility to this person. (Finding A1-TQ-06)

Training records on a 9215 M-Wing round sheet used to implement CSR-MCS-056, *M-Wing Machine Coolant*, were requested. The cognizant training individual said EUO training did not conduct training on round sheets, except for general completion requirements (e.g., how to redline an out-of-specification reading). When reviewed, the *Y-12 Nuclear Operations Conduct of Training Manual* did not assign anyone responsibility for assessing training needs associated with changes to round sheets. Personnel in Building 9215 using the checksheet misinterpreted a CSR requirement (see CO-19). Other round sheets implemented OSR/TSR/CSR surveillances and requirements.

Conclusion:

Training to prepare workers for initial qualification was adequate. However, the program used to evaluate EUO training needs for revised procedures, and to control field activities prior to completion of required training on the revisions, had weaknesses. When actions needed to close the prestart findings are complete, the CO-16 requirements for training will be satisfied.

Inspected by: C. K. Stalnaker	Approved by: [signature] ORR Team Manager Date: 4/14/98

Form 1

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ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-17)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criterion:

Operations personnel have adequate knowledge of processes and requirements to fulfill their duties.

Personnel contacted/position:

Casting Shift Supervisor
Casting Operator
Chemical Supervisors
Chemical Operators
Machine Coolant Operators
M-Wing Machinists
Building 9215 Operations Manager
M-Wing Shift Supervisor
O-Wing Supervisors
O-Wing Machinists
EUTO Material Clerk
Dimensional Inspection Supervisor
Dimensional Inspection Operators

Records & other documents reviewed:

Document Y/MA-7324, *Furnace Run Details (U)*
JPA-EW-C-SACL-0001, *E-Wing Casting - Stack Assembly*
JPA-EW-C-SACL-0002, *E-Wing Casting - Crucible Loading*
JPA-EW-C-FLUL-0001, *E-Wing Casting - Main Line Conveyor*
JPA-EW-C-FLUL-0002, *E-Wing Casting - Main Line Conveyor Unloading*
JPA-EW-C-FLUL-0003, *E-Wing Casting - East Furnace Unloading*
JPA-EW-C-FLUL-E/W0002, *E-Wing Casting - Furnace Loading*
JPA-EW-C-CAST-E0001, *E-Wing Casting - East Furnace Preparation*
JPA-EW-C-CAST-E0002, *E-Wing Casting - East Furnace Manual Operation*
JPA-B1-LAB-0001, *Use of Laboratory Hoods*
JPA-B1-LAB-0007, *Standard PPM Analysis*

ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-17)	Date: April 14, 1998

JPA-B1-LAB-0011, *Calibrating the pH Meter*
JPA-B1-LAB-0012, *pH Analysis*
Procedure Y50-37-93-800, *Fluorometer Setup*
Procedure Y50-37-10-002, *M-Wing Machine Coolant System*
Procedure Y50-37-10-006, *Machining Operations*
Procedure Y50-37-98-667, *Filter and Separate Station Operations*
JPA-EU-0010, *Sampling Safe Bottles*
Procedure Y50-37-65-104, *Enriched Uranium Chip Drying and Briquetting*
Procedure Y50-37-98-668, *Code 80 Glovebox Operation*
Procedure Y50-37-20-002, *Billet Salt Bath Operations*
Procedure Y50-37-20-003, *Rolling Mill Operation*
Procedure Y50-37-20-055, *Operation of the Gantry Control System*
Procedure EUO-5A-20-001, *O-Wing Gantry Control System Alignment Checks*
Procedure Y50-37-98-601, *High Capacity Evaporator, HC/O-C-7101 Operation*
JPA-NDA-0008, *Miscellaneous Activities in the NDA Facility*
Procedure Y50-37-20-056, *Verson 25" Hydroform Operation*
Procedure Y50-37-20-063, *Convection Oven Operation*
Examination Question Banks for various positions
Examinations and Answer Keys prepared for the casting operators, casting supervisor, O-Wing supervisors, and evaporator operators
JAP-OW-SCS-0001, *Scrap Shear Operation*
Procedure Y50-55-DI-H002, *Moore Measuring Machine Operation in H-2 Fissile Inspection Area*

Evolutions/operations witnessed:

Casting stack assembly, furnace loading, and casting a part
Fluorometer and pH meter calibration followed by a pH and PPM analysis
Startup of machine coolant system
Machining of two parts on separate machines
Valve alignment of rolling and forming equipment
Wet vacuum system operations
NDA lab operations
High capacity evaporator operation
Transformation of a billet into a rolled plate
Hydroforming a part
Sampling and transfer of process condensate
Witnessed the administration of the examinations
Scrap shear operation
Dimensional inspection of a part

ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-17)	Date: April 14, 1998

Sampling safe bottles
Chip drying and briquetting
Sifting oxide in a glovebox

Discussion:

A casting shift supervisor and operator used five job performance aids (JPA) to create a stack assembly and load it into a casting furnace. The supervisor and operator were asked approximately 20 questions pertaining to this activity to determine if they understood the JPAs and the OSR and CSR requirements referenced in the JPAs and to verify their facility-specific level of knowledge. All answers were explained in detail and no deficiencies were noted. In addition, the supervisor and operator used three other JPAs and another document (Y/MA-7324) to cast a part. They were asked approximately 30 questions to determine if they understood the JPAs and the CSR requirement referenced in one of the JPAs. Again, all answers were explained in detail, and no deficiencies were noted.

A chemical operator used four JPAs and a procedure to calibrate a pH meter and a fluorometer, and then perform a pH and parts per million (ppm) analysis. The chemical operator was asked approximately 15 questions pertaining to this activity to determine if the JPAs, procedure, and CSR requirements referenced in one JPA were understood. All answers were explained in detail and no deficiencies were noted.

During an observation of two machine coolant operators, the following were noted:

a. The two machine coolant operators were knowledgeable about how to start up the machine coolant system.

b. When the two machine coolant operators were asked to walk through mixing new coolant, they said they did not know what to use to measure 1289 grams of sodium nitrite. They said they had never mixed new coolant or walked through the evolution. A process engineer later showed them the electronic scale used to measure sodium nitrite.

c. When the two machine coolant operators were asked to walk through the cleaning of machine coolant, they said they did not know where the flowmeter was located that monitored coolant flowrate. They said they had never cleaned coolant or walked through the evolution. A process engineer later showed them where the flowmeter was located.

Two machinists were observed machining parts. The following were noted:

a. The two machinists were technically proficient.

b. One machinist cleaned a depleted uranium part with several paper wipes. They were visibly stained with uranium oxide. He laid the wipes on the machine headstock foundation, an area not expected to be contaminated, while he transported the part to a flat surface for dimensional checks. After he replaced the part in the machine, he disposed of the wipes in a nearby contaminated combustible can.

c. The other machinist had his wheeled tool box on the opposite side of the white-lined shop walkway from the lathe he was using. The engineering specification paperwork for the part he was machining was on his tool box. He walked from the lathe to his tool box and back at least six times while wearing gloves he used to handle a depleted uranium part.

Performance of a valve alignment, including an associated pre-job brief of O-Wing equipment, was observed. The following items were noted:

a. The pre-job brief identified the fact that valves and electrical components were located in several areas outside the normal O-Wing rolling and forming operating area. Three different radiological work permits (RWP) would be used. An operator pointed out that several of the valves would be greater than eight feet off the floor, requiring use of a ladder and different RWP dress out and monitoring requirements. All these problems were resolved before the three operators left to perform their system valve alignments.

b. Each operator conducting a system valve alignment had a mentor with him who provided coaching and guidance. The mentor was assigned this function by the daily Mentor Assignments sheet.

c. After dressing out in the required anticontamination clothing and entering the third mill area, the operator assigned to perform the rolling and forming equipment valve alignment said he did not know where the valves were located. He located a Depleted Uranium Operations (DUO) operator, who told him the valves were located in an area that required different radiological dress-out requirements and a different RWP. After contacting his supervisor, he was told to come out of the area and complete the remainder of the valve alignments in the O-Wing operating area. After doffing his anticontamination clothing, he said he did not have sufficient time (one hour) to don and doff anticontamination clothing and align valves in the O-Wing area before the end of the work day. After obtaining his supervisor's concurrence, he waited for the end of the work day. He did not align any valves.

Operators were observed attempting to place the wet vacuum system in operation on three different occasions. When several of the operators were questioned, they exhibited a good understanding of the OSRs, CSRs, and components associated with the system. During the pre-job briefs, the supervisor read the precautions and limitations (which contained applicable OSR and CSR requirements) to the operators and repeatedly quizzed the operators about the OSRs and the CSRs. The operators' responses to questions were always correct.

Operators were observed performing Procedure Y50-37-98-601. When asked, they demonstrated an excellent knowledge of the high capacity evaporator system.

Operators were observed performing JPA-NDA-0008. They demonstrated an excellent knowledge of the nondestructive analysis process.

Two O-Wing supervisors and three machinists used three procedures to start up and operate the rolling mill, billet salt bath, and gantry control system to transform a billet into a plate. Shutting down of the rolling mill, billet salt bath, and gantry control system was also observed. The supervisors and machinists were asked over 75 questions pertaining to this activity to determine if they understood the procedures and CSR requirements referenced in the procedures and to verify their facility-specific level of knowledge. The operations manager was also interviewed to determine if he understood the procedures and related CSR requirements. Most answers were explained in detail. Only the following deficiencies were noted:

a. Prerequisite action step 3.3.[7] of Procedure Y50-37-20-055 required a machinist to start a recirculation pump at the Sheet Rinse Level Control Panel. As he started the pump, he monitored two LED tank level indicators (TLI) located on the same control panel above the pump start buttons for two sets of tanks. He said he monitored the tank levels to ensure they steadied out to a constant level reading thereby ensuring the recirculation system did not have a leak. This action was not required by the procedure. When asked to describe the purpose of the two sets of tanks and what was a satisfactory range for the tank levels, both the machinist and his supervisor said they did not know. In addition, the procedure did not address a satisfactory range for the tank levels. A review of the system drawings revealed one set of tanks provided net positive suction head (NPSH) for the sheet rinse recirculation pumps and the other set of tanks provided NPSH for the high pressure sheet rinse pumps.

b. Step 4.1.3.[2] of Procedure Y50-37-20-055 directed the supervisor to type SHOW SYSTEM into the VAX computer terminal and press RETURN. The next step provided direction on how to stop the display from scrolling too fast so the line entry CIMCELL RUNNING would not be missed. When the supervisor typed SHOW SYSTEM and pressed RETURN, he did not stop the display from scrolling. When the display had stopped, some information had scrolled off the screen. CIMCELL RUNNING was a line entry displayed on the screen. When asked how he would know if CIMCELL RUNNING was on the display off the screen if it had not appeared on the display once the scrolling stopped, he did not have an answer. The presence or absence of the CIMCELL RUNNING line entry determined whether Section 4.2, "Cold Start-up," or Section 4.3, "Warm Start-up," was subsequently used.

ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-17)	Date: April 14, 1998

A chemical supervisor and two chemical operators were observed sampling and transferring process condensate from hold-up tank F-6001 to a storage tank using Procedure Y50-37-98-601. The supervisor and operators were asked approximately 20 questions pertaining to this activity to determine if they understood the procedure and CSR requirements referenced in the procedure and to verify their facility-specific level of knowledge. The following were noted:

a. Neither the supervisor nor the operators knew how long it would take to transfer 100 gallons of process condensate from one tank to the other or the capacity of the transfer pump. They said they had never performed this activity before.

b. An operator was required to record a totalizer flow reading on a run sheet. The operator asked a mentor what the units of measurement were instead of the supervisor who was nearby. The mentor told the operator that all units of measurement were in gallons. When asked, the mentor said his function was only one of safety oversight.

c. Step 4.7.4.[8] required the operator to select a transfer pump. Transfer pump J-6002A was selected and the operator attempted to start the pump as required by the next step. However, there was no indication that the pump started. The operator was going to push the pump start button again, but the mentor stopped him and told the supervisor that the shift manager needed to give permission to attempt to start the pump again. Permission was granted and the operator attempted to start the pump a second time. However, the pump did not start again. The shift manager told the supervisor to check the breaker to the pump to ensure it was shut. Both the supervisor and operators said they did not know where the breaker was located. The supervisor told the shift manager that a process engineer was needed to provide that information.

d. Shortly thereafter, the shift manager told the supervisor that pump J-6002A could only be used with tank F-6000, that pump J-6002B had to be used with tank F-6001, and that the procedure was suspended until he reviewed the situation with all parties involved. When asked, neither the supervisor nor the operators knew that each pump could only be used with a specific tank. The supervisor said she completed training on the system approximately five months earlier, and one of the operators said he completed training on the system approximately one and one-half months earlier.

e. During the shift manager's review, it was determined that the pump might have started and no one knew it. Therefore, the shift manager directed that the status of the pump be checked locally. An operator discovered the pump was running, and the shift manager directed that it be stopped. The pump ran for one and one-half hours at a shut-off head without anyone knowing it.

An O-Wing supervisor and three machinists were observed hydroforming a part using three procedures. During this activity, start-up, operation, and shutdown of the hydroform, gantry control system, and a convection oven were also observed. The supervisor and machinists were asked approximately 30 questions pertaining to this activity to determine if they understood the procedures and CSR requirements referenced in the procedures and to verify their facility-specific level of knowledge. No deficiencies were noted.

An O-Wing supervisor, machinist, and EUTO material clerk were observed shearing scrap metal using JPA-OW-SCS-0001. The supervisor, machinist, and material clerk were asked approximately a dozen questions pertaining to this activity to determine if they understood the JPA and CSR requirements referenced in the JPA and to verify their facility-specific level of knowledge. No deficiencies were noted.

A Product Certification supervisor and two operators were observed performing a dimensional inspection of a mock-up weapons part using a Moore Measuring Machine. The supervisor and operators were asked approximately a dozen questions pertaining to this activity to determine if they understood the procedures and CSR requirements referenced in the procedures and to verify their facility-specific level of knowledge. No deficiencies were noted.

Two operators, a mentor, and a supervisor were observed filtering and sampling the contents of a safe bottle. The operators were knowledgeable in their jobs and answered several questions concerning the activity correctly. They also demonstrated excellent RADCON awareness.

Two operators, a mentor, and a supervisor were observed drying chips and forming a briquette. They answered several questions dealing with the procedure and applicable CSRs correctly. During the post-job brief, they critically examined issues that arose during the procedure performance and exhibited a desire to improve their level of knowledge.

A chemical supervisor and three chemical operators were observed sifting oxide from the machine shop in a glovebox using Procedure Y50-37-98-668. The supervisor and operators were asked approximately 25 questions pertaining to this activity to determine if they understood the procedure and CSR requirements referenced in the procedure and to verify their facility-specific level of knowledge. No deficiencies were noted.

Examination questions were selected from the existing question banks for the various positions to be tested. The examination questions selected focused on administrative, BIO/OSR, safety, and generic knowledge. Each operator examination included questions from the General Area Operator and the specific operator qualification/certifications. Each exam contained at least 20 questions.

The examinations were administered and proctored by a qualified instructor. The instructor explained the purpose of the test, the examination instructions, and the company policy regarding cheating. The instructor was present during the entire examination in order to answer any questions the examinees may

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have had and to fulfill his duties as the examination proctor. Only one examinee requested clarification of a question, and the instructor handled this request in a very professional manner.

The exams were graded by the instructor, and the grading was consistent with the answer keys provided. There were minor clerical errors on the evaporator operator examination, but these did not seem to impact the ability of the examinees to answer these questions.

Of the ten exams given, only one person failed (grade less than 70 percent) an examination. A question analysis revealed that only two questions were missed by all individuals taking a particular examination, and these questions had multiple parts. If one part of the question was missed, it was considered to be a missed question, even though in some cases the examinees received a majority of the points available. One question asked the O-Wing supervisors to identify two of the safety systems at their facility. Only one O-Wing supervisor, out of the three O-Wing supervisors who took the examination, could identify any safety systems at his facility. This fact was of some concern, considering the extensive training that has been provided on this topic and the supervisor's role in maintaining the facility safety envelope.

Conclusion:

Personnel in the field understand procedures, JPAs, OSRs, and CSRs. Qualification/certification examinations adequately verify facility-specific level of knowledge. Although some level of knowledge weaknesses exist in some areas, operations personnel have adequate knowledge of processes and requirements to fulfill their duties. The criterion for this core objective has been met.

Inspected by: J. R. Sprenkle W. E. Hill	Approved by: ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-18)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Only qualified personnel are assigned to operations positions.

2. There are adequate numbers of qualified operators available to fill positions defined in operating procedures.

Personnel contacted/position:

EUO Training Department Manager
Chemical Process and Recovery Trainer
Building 9215 Operations Manager
Building 9215 Shift Manager
Machine Coolant Operators
M-Wing Machinists
M-Wing Shift Supervisor
Building 9215 MAA Functional Manager
M-Wing Machining Production Manager
Chemical Supervisors
Chemical Operators
O-Wing Supervisors
O-Wing Machinists
EUTO Material Clerk
Dimensional Inspection Supervisor
Dimensional Inspection Operators

Records & other documents reviewed:

Y/MA-7316, *ORR POA for EUO Restart Phase A*1
Y/MA-7322, *9212 and 9215 Chemical and Metal Processing Minimum Staffing and Production Staffing Requirements*
Y/MA-7278, *EUO PBR Qualification Areas and Process Assignments*
Training and Qualification Program Description for M-Wing Supervisor

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Training Management Report (TMS} for Program 05670, Machine Coolant Operator
TMS Detail Report for Machine Coolant Operator
Procedure Y50-37-10-002, *M-Wing Machine Coolant System*
Procedure Y50-37-10-006, *Machining Operations*
JPA-NDA-0005, *Measuring Fissile Material on the SGS in the NDA Facility*
Procedure Y50-37-98-667, *Filter and Separate Station Operations*
JPA-EU-0010, *Sampling Safe Bottles*
Procedure Y50-37-65-104, *Enriched Uranium Chip Drying and Briquetting*
Procedure Y50-37-98-668, *Code 80 Glovebox Operation*
Procedure Y50-37-036, *Generic Wet Vacuum Trap Normal Operations*
Procedure Y50-37-001, *Generic Wet Vacuum Final Trap Surveillance*
Procedure Y52-37-98-025, *Headhouse Fan Room Wet Vacuum Trap System Weekly Surveillance*
Procedure Y50-37-20-002, *Billet Salt Bath Operations*
Procedure Y50-37-20-003, *Rolling Mill Operation*
Procedure Y50-37-20-055, *Operation of the Gantry Control System*
Procedure Y50-37-20-056, *Verson 25" Hydroform Operation*
Procedure Y50-37-20-063, *Convection Oven Operation*
Procedure Y50-37-98-601, *High Capacity Evaporator, HC/O-C-7101 Operation*
JPA-OW-SCS-0001, *Scrap Shear Operation*
Y50-55-DI-H002, *Moore Measuring Machine Operation in H-2 Fissile Inspection Area*

Evolutions/operations witnessed:

Casting stack assembly, furnace loading, and casting of a part
Fluorometer and pH meter calibration followed by a pH and PPM analysis
Start up of machine coolant system
Machining of two parts on separate machines
Wet vacuum system operation
NDA lab operation
High capacity evaporator operation
Transformation of a billet into a rolled plate
Hydroforming a part
Sampling and transfer of process condensate
Scrap shear operation
Dimensional inspection of a part
Sampling safe bottles
Chip drying and briquetting
Sifting oxide in a glovebox

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Discussion:

Procedure Y/MA-7322 listed the minimum staffing requirements for operations personnel, including both normal and off-normal conditions, for 48 qualification areas. The minimum staffing requirements were compared to the number of people actually qualified/certified for each qualification area. The number of people qualified/certified in each qualification area met or exceeded the minimum staffing requirements in each qualification area.

A casting shift supervisor and operator were observed creating a stack assembly, loading it into a casting furnace, and casting a part to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

A chemical operator was observed calibrating a pH meter and a fluorometer and then performing a pH and parts per million (ppm) analysis to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

Two machine coolant operators were observed starting up the machine coolant system. Both operators were current in all requirements for TMS Program 05679, *Machine Coolant Operators*. The Building 9215 operations manager said both operators were certified to perform all operations described in Procedure Y50-37-10-002. However, both operators said they had never performed or walked through the following infrequently conducted evolutions described in the procedure:

a. mixing new coolant

b. adjusting chemical makeup of coolant

c. tray inventory

d. coolant cleaning

These four evolutions had been simulated, according to the Machine Coolant Operator Certification Cards. The two machinists observed machining parts were qualified. There were adequate numbers of qualified operators available to fill positions defined in the two procedures observed.

Performance of the wet vacuum system startup was observed and required two operators and a mentor. Additionally, a supervisor, a process engineer, a production manager, the building operations manager, a criticality safety engineer, and a DOE facility representative were present. The mentor was in the safety oversight role. The number and qualification of operating personnel was adequate.

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A pre-job brief and performance of a wet vacuum system surveillance was observed. The pre-job brief was excellent. No problems were noted during performance of the procedure. The procedure required four operators, a supervisor, and a mentor. Also present were a production manager, a product engineer, a DOE facility representative, and the deputy operations manager. The operators made excellent use of repeat backs. The number and qualification of operating personnel was adequate.

Two chemical operators and a mentor were observed performing nondestructive analysis measurements to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

Two O-Wing supervisors and three machinists were observed starting up, operating, and shutting down the rolling mill, billet salt bath, and gantry control system to transform a billet into a plate to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

A chemical supervisor and two chemical operators were observed sampling and transferring process condensate from a hold-up tank to a storage tank using Procedure Y50-37-98-601 to determine if the number and qualification of operating personnel were adequate. No deficiencies were noted.

An O-Wing supervisor and three machinists were observed hydroforming a part using three procedures to determine if the number and qualification of operating personnel were adequate. During this activity, start-up, operation, and shutdown of the hydroform, gantry control system, and a convection oven were also observed. No deficiencies were noted.

A chemical supervisor and three chemical operators were observed operating and shutting down the high capacity evaporator to determine if the number and qualification of operating personnel were adequate. No deficiencies were noted.

An O-Wing supervisor, machinist, and EUTO material clerk were observed shearing scrap metal using JPA-OW-SCS-0001 to determine if the number and qualification of operating personnel were adequate. No deficiencies were noted.

A Product Certification supervisor and two operators were observed performing a dimensional inspection of a mock-up weapons part to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

A chemical supervisor and two chemical operators were observed sampling safe bottles to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

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A chemical supervisor and two chemical operators were observed drying and briquetting stainless steel Brillo pads to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

A chemical supervisor and three chemical operators were observed sifting oxide from the machine shop inside a glovebox to determine if the numbers and qualifications of operating personnel were adequate. No deficiencies were noted.

Conclusion:

Based on the records reviewed, personnel interviewed, and evolutions witnessed, the numbers and qualifications of operating personnel necessary to perform the tasks specified in the operating procedures and JPAs are adequate for normal and off-normal conditions. The criteria for this core objective have been met.

Inspected by: J. R. Sprenkle T. L. Betz W. E. Hill	Approved by: [signature] ORR Team Manager Date: 4/14/98

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Method of Appraisal (short narrative description):

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

Criteria:

1. Programmatic elements of conduct of operations (COO) are in place, as defined in the *Nuclear Operations Conduct of Operations Manual.*

2. Personnel have been trained in key COO principles.

3. Weaknesses in COO have been identified and corrective or compensatory actions are in place.

Personnel contacted/position:

Restart Test Engineer
Casting Shift Supervisor
Casting Operator
Operations Managers
Chemical Supervisors
Chemical Operators
Shift Technical Advisors
Criticality Safety Engineers
Production Managers
Product Certification Supervisors
Radiography Operators
Radiological Control Technicians
Mentors
Machine Coolant Operators
O-Wing Supervisors
O-Wing Machinists
Shift Managers
EUO Facility Manager
EUTO Material Clerk
Dimensional Inspection Operators

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Records & other documents reviewed:

CL-EU-9212-081, *E-Wing East Furnace Check List*
JPA-EW-C-CAST-E0001, *E-Wing Casting - East Furnace Preparation*
Procedure Y50-37-92-503, *Headhouse Fan Room Wet Vacuum Normal Operations*
Procedure Modification Request (PMR) 98-EU-0406 for *Headhouse Fan Room Wet Vacuum Normal Operations*
USQD Screening Work Sheet for revision to Y50-37-92-503, screen number 9212-98-075
Procedure Y50-37-98-602, *High Capacity Evaporator Process Condensate Monitor Test*
Procedure Y50-37-98-601, *High Capacity Evaporator, HC/O-C-7101 Operation*
Procedure Y52-37-98-025, *Headhouse Fan Room Wet Vacuum Trap System Weekly Surveillance*
Procedure Y50-37-036, *Generic Wet Vacuum Trap Normal Operations*
Procedure Y50-37-001, *Generic Wet Vacuum Final Trap Surveillance*
Procedure Y50-55-PT-E464, *Operation of 1 MeV/2 MeV Linac, Building 9998*
JPA-B1-LAB-0007, *Standard PPM Analysis*
CL-EU-9212-005, *B-1 Lab Operator Weekly Checklist*
Procedure Y50-37-10-002, *M-Wing Machine Coolant System*
CL-EU-9212-081, *E-Wing East Furnace Checklist*
CL-EU-9212-081, *E-Wing West Furnace Checklist*
JPA-NDA-0005, *Measuring Fissile Material on the SGS in the NDA Facility*
Procedure Y50-37-20-002, *Billet Salt Bath Operations*
Procedure Y50-37-20-003, *Rolling Mill Operations*
Procedure Y50-37-20-055, *Operation of the Gantry Control System*
Procedure Y50-37-20-056, *Verson 25" Hydroform Operation*
Procedure Y50-37-20-063, *Convection Oven Operation*
SO-EUO-98-002, *Verification of Valve Alignments*
SO-EUO098-001, *Evaluation of Procedural and JPA Discrepancies*
SO-EUO-97-012, *System Status*
Required Reading, *PA System Usage in the Bldg 9212 Complex*
Chapter 10, "Independent Verification" of the *Nuclear Operations Conduct of Operations Manual*
Approximately 25 completed round sheets
JPA-OW-SCS-0001, *Scrap Shear Operation*
Procedure Y50-37-98-667, *Filter and Separate Station Operation*
JPA-EU-0010, *Sampling Safe Bottle*
Procedure Y50-37-65-104, *Enriched Uranium Chip Drying and Briquetting*
Procedure Y50-55-DI-H002, *Moore Measurement Machine Operator WH-2 Fissile Inspection Area*
Procedure Y50-37-98-668, *Code 80 Glovebox Operation*
Procedure Y50-37-018, *Equipment Holdup Survey*

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Evolutions/operations witnessed:

Casting stack assembly, furnace loading, and casting a part
Management review of nuclear criticality safety procedural non-compliance
Pre-job brief and performance of wet vacuum system operations and surveillance
Radiographic operations in Building 9998
Fluorometer and pH meter calibration followed by a pH and PPM analysis
Machine coolant system start-up
Machining operations
Dimensional inspection of a part
C-Wing operator rounds
M-Wing operator rounds
O-Wing operator rounds
NDA lab operations
O-Ring rolling mill pre-startup valve and electrical breaker/switch alignment
Pre-job brief and performance of the high capacity evaporator process condensate monitor test
Pre-job brief and high capacity evaporator operation
Transformation of a billet into a rolled plate
Hydroforming a part
Sampling and transfer of process condensate
Scrap shear operation
Pre-job brief and sampling of safety bottle
Pre-job brief and chip drying and briquetting
Sifting oxide in a glovebox and post-job brief
Surveys in M-Wing basement

Discussion:

A casting shift supervisor and operator used five JPAs to create a stack assembly and load it into a furnace. A pre-job brief was conducted by the supervisor. All JPAs were followed, and no deficiencies were noted. In addition, one JPA required ensuring a daily checklist was completed. The checklist was completed satisfactorily. The casting supervisor and operator also used three JPAs and a classified document to cast a part. A pre-job brief was also conducted by the supervisor for this job. All JPAs and the classified document were followed, and no deficiencies were noted. Prior to casting the part, the operator completed two checklists satisfactorily.

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During an observation of wet vacuum operations, the following were noted:

a. The pre-job brief was attended by 12 people associated with the upcoming work, which consisted of three procedures. The supervisor covered precautions and limitations for all three procedures, covered the scope of the work, discussed past problems, covered alarm response, and asked for questions.

b. During performance of the evolution, the DOE facility representative pointed out a 3"x 6" yellow criticality safety sign that provided guidance on allowed containers in a rack. No rack was present, nor did the sign reference a Criticality Safety Approval (CSA) or Nuclear Criticality Safety Approval (NCSA). The supervisor requested guidance from the criticality safety engineer who was present. The criticality safety engineer said it was not a problem. The supervisor called the operations manager on the phone and was told to implement 15 feet controls immediately. This was done. The sign was removed from the wall after obtaining written guidance from criticality safety. The boundaries were then released.

c. A management review of the criticality safety procedural non-compliance was held immediately afterwards. Seventeen people, including all the principals, were in attendance. The shift technical advisor (STA) ran the review and solicited input from the attendees. The operations manager asked why he had to implement controls when the criticality safety engineer was present and should have done so. The criticality safety engineer said the sign did not appear to belong to a CSA, and it was not apparent it was a criticality safety sign. The operations manager emphasized the need to follow the governing procedure that covered controls for situations such as this. The noncompliance was scheduled to be discussed in the crew briefing and was transmitted to the Issues Management Group. Management subsequently sent people out to look for similar problems.

d. During day 1 performance of Procedure Y50-37-92-503, the mentor, the supervisor, a production manager, and the DOE facility representative interpreted system responses and directed operator actions during procedure performance.

e. At the start of day 2, Procedures Y50-37-036 and Y50-37-001 were scheduled for performance as they had been on day 1. However, on day 2, the shift manager's office would not give approval for performance of the procedures. Shift manager permission had been obtained on day 1 for the exact same procedures. On day 2, the shift manager's office had implemented a new system for verifying plant conditions, which utilized a different data base. This data base contained three deficiencies that were not in the data base used on day 1. The shift manager's office required the process engineer to disposition each deficiency on the wet vacuum system before giving permission to proceed.

f. On day 4, performance of the wet vacuum system startup and surveillance was resumed after a pre-job brief. Performance of the procedure required two operators and a mentor. Additionally, a supervisor, a process engineer, a production manager, the building operations manager, a criticality safety engineer, and a DOE facility representative were present. The mentor was in the safety oversight role. The procedures had been revised since day 2 to remove redundant component labels and unnecessary tags. The procedures were completed with one incident. Steps 5.8 and 5.9 directed the operator to drain water into a 4-liter container and dispose of it in a pour-up station. Step 5.10 allowed Steps 5.8 and 5.9 to be repeated as necessary. It was required to be repeated one more time. However, the production engineer stopped the procedure because the operators had proceeded to Step 5.11 without initially completing Steps 5.8 and 5.9 twice, even though he had initialed 5.10 and completed draining the trap. They contacted the shift manager to inform him they had performed a step out of sequence, waited on authorization, and then proceeded. The operators, mentor, production manager, supervisor, and the DOE facility representative participated in resolving the situation. The mentor intervened one time with a concern about ladder safety; he also coached.

g. A trap alarm was not silenced until the procedure directed (about 1 minute after actuation). The procedure required blanks to be filled in from a page in the back of the procedure. This was awkward to do in the work area. It could have been done during the pre-job brief, since the participants should know which trap was being tested. The operators made good use of repeatbacks on all three days. All pre-job briefs were excellent.

On day 5, a pre-job brief and performance of a wet vacuum system surveillance was observed. The pre-job brief was excellent. No problems were noted during performance of the procedure. The procedure required four operators, a supervisor, and a mentor. Also present were a production manager, a product engineer, a DOE representative, and the deputy operations manager. The operators made excellent use of repeatbacks.

Nondestructive analysis activities were observed. The task required two operators, an Analytical Services Organization (ASO) person, and a mentor. The mentor was in a safety oversight role. Three ASO employees, the building operations manager, a production manager, and a DOE representative were also present. The JPA had been issued on day 4, even though NDA activities had been on-going. One of the operators practiced self-checking after installing one of the drum standards and caught and corrected two incorrectly loaded standard vessels inside the drum. No intervention by any of the extra persons or the mentor was required to complete the JPA.

Two machine coolant operators demonstrated satisfactory conduct of operations principles in their valve and electrical component operations while starting up the E-Wing machine coolant system using a Class II procedure.

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During radiography operations in Building 9998, the following were noted:

a. Five product certification radiography operators, two supervisors, two Nuclear Criticality Safety Organization (NCSO) representatives, one radiological control technician, and an EUO mentor radiographed a metal part. Thirteen radiographs were required to complete the inspection. Procedure Y50-55-PT-E464 was used. The supervisor conducted a comprehensive pre-job brief that included radiological conditions, equipment, and safety issues. Personnel used the applicable RWP and recorded accumulated doses on the appropriate log sheet. Operators used the procedure either in-hand or near-at-hand and, in general, performed radiography in a step-by-step manner in accordance with the procedure.

b. RWP 98-A-0012, *9212 MAA, 9981 X-ray Facility*, required a pre-job briefing that covered use of electronic dosimeters, lab coat surveys/frisks, and bench top radiological controls. The supervisor conducted the pre-job brief using a checklist approved by the EUO manager. The checklist and the briefing covered dosimetry and radiological controls, but not surveys of lab coats.

c. The pre-job briefing checklist had blanks for the supervisor to enter the time/date/location of the briefing, the applicable procedure number, and a description of the job. These sections were not completed prior to the briefing. Two hours later, near the end of the work assignment, these entries had still not been made. The supervisor recorded the names of the radiographic operators on a *Work Area Assignment Sheet.* This EUO form was used to obtain shift manager approval of work assignments. Completion of the form had the following discrepancies:

   (1) The form used by the supervisor was a photocopy of the front side of the two-sided EUO master. The supervisor said he did not have a copy of the instructions for completing the form, which were on the reverse side of the master.

   (2) The "Hours Worked" column was left blank. The instructions required entry of time required to complete the task to be entered.

   (3) The checklist required approval of the shift manager. Approximately two hours into the evolution, the mentor was asked if the form needed approval. He said it did. The supervisor was then asked about the need for approval. The supervisor said he forgot to get approval.

d. The assignment of the mentor to the radiography project was recorded on the EUO Mentor Assignments listing dated March 3, 1998. According to a note at the bottom of this list, the mentor was to provide safety oversight, defined as including "ensure(ing) applicable procedures were being followed in a correct, step-by-step manner." The mentor did not intervene or discuss lack of approval of the Work Area Assignment Checklist with the supervisor when told of the missing approval.

e. Y50-55-PT-E464 was a Category II procedure, requiring step-by-step performance of action steps in the specified sequence. Certain action steps were specified in the Precautions and Limitations section of the procedure, instead of the Prerequisites and Performance Sections, including the following:

(1) controlling access to the console key

(2) wearing a personal radiation monitor

(3) completing a pre-use inspection checklist each day radiography was performed

f. The operators performed pre-use checks of the equipment approximately two and one-half hours before the pre-job briefing. These checks were recorded on CL-EU-8212-109, *Radiation Protection Checklist*. Two items on the checklist had errors. Item 6 asked "Do red lights on console marked "X-Ray On" or "Radiation" light up when X-ray is on? The "X-Ray On" button was actually labeled "Beam On." Item 7 asked "Do both the "System On" and "VSD" red lights flash with X-Ray On?" The "System On" button was actually labeled "XRY."

g. Step 5.3.[10] of the procedure stated a laser beam on the X-ray head could be used to locate the center of the beam. When asked, the operators said the beam was not being used because it had not been properly aligned following relocation of the X-ray machine.

h. Step 5.3.[14] of the procedure was to press the appropriate energy level button, either 1 MEV or 2 MEV. The 2 MEV button was pushed as specified by the Category II procedure on the first exposure. It was not performed (and did not need to be performed) on the second through seventh exposures because the energy level had already been established. The procedure did not acknowledge skipping this step on multiple exposures.

i. Step 5.3.[19] was to adjust the dose rate "as needed." When the first exposure was initiated, this dose rate was 240 R at 1 meter. The supervisor intervened and adjusted the rate to 200 and stated the rate should never exceed 200 for a 2 MEV exposure. The procedure did not specify a maximum allowable dose rate.

During another evolution, a chemical operator used four JPAs and a procedure to calibrate a pH meter and a fluorometer, and then performed a pH and PPM analysis. A pre-job brief was conducted satisfactorily by the supervisor. A Mentor Assignments list, dated March 3, 1998, required a mentor to be present for B-1 Lab operations. However, a mentor was not present for the calibrations or analyses. The following steps were not followed by the operator:

(1) Step [3] required drawing 0.1 mL of solution from a sample bottle or separatory funnel. The operator drew 0.1 mL of solution from a 100 mL beaker.

(2) Step [14] required residue contents of a platinum dish to be placed into a beaker in LAB-R-52, B-1 LAB HOOD. The operator placed the residue on top of a cooling plate, performed Steps [15] and [16], and then placed the residue in a beaker in the hood.

A chemical operator was observed performing C-Wing rounds. A mentor was present for the rounds. The following items were noted:

a. During checks of the scrubber, the operator wrote that the majority of the systems were in standby; however, he recorded readings for one of the scrubber gauges. A review of the previous week's roundsheet showed the same gauge reading was recorded as in "standby". The status of the scrubber had not changed since the previous week. The shift manager initially said the scrubber was in standby, but then decided it was out of service. Therefore, the correct entry for the roundsheets should have been OOS. Building 9212 conduct of operations guidance listed five allowed status states: reading recorded, standby, OOS, NRT, and void. Standing Order SO-EUO-97-012, "System Status Standing Order," listed 11 allowed status states: EM Use, Limited, OOC, OOS, OOT, Oper, REM/ACT, Run, Shutdown, Standby, and Term. A mentor said the standing order should be withdrawn as it caused confusion (Finding A1-OP-01).

b. During rounds, the operator continually rounded off both analog and digital readings. He said he had been trained to do so. The AEC-AG-9301 Scrubber Exhaust Filter House DP-3rd Floor required 19 readings to be recorded. Nine of the HEPA filter readings had minimum limits of 0.5 inches of water gauge. The actual reading on four of these was below 0.5 in. wg. (0.48-0.49); however, the operator rounded them up and recorded them as in specification at 0.5 in. wg. When questioned about one of these readings, the operator and mentor discussed it, left the recorded reading of 0.5, but circled it in red and provided a comment. Note 2 on page 4 of 10 of the round sheet stated: "If DP is less than 0.2 in wg for a prefilter OR DP is less than 0.5 in. wg. for a HEPA filter, THEN verify the dampers are open." Four of the readings were below 0.5 in. wg., one of these was circled and commented on the roundsheet, but the dampers were not checked. The AEC Scrubber Shutdown Checks verified a bubbler read between 1.2 and 1.4 standard cubic feet per hour. The bubbler read 1.1. The roundsheet stated to "adjust the rotameter as required;" however, the operator said he thought you had to attend AEC scrubber school to be qualified to adjust the rotameter and declined to adjust it. He circled it in red and commented on it. When the operator reported back to his supervisor, he was told he could have adjusted the rotameter. His supervisor later said he had been told there were qualification requirements to adjust the rotameter. During follow up, the SME with the Training Department said GAO qualification was all that was required to adjust the bubbler (Finding A1-OP-01).

c. Other problems noted during the rounds were as follows:

(1) Item 25 checked a safe bottle level. The level could not be seen due to a metal cover around it.

(2) The friskers used to exit the area had not undergone daily checks - found by an observer and noted by the operator.

(3) A forklift being used by MK Ferguson had an inoperative backup warning device.

(4) A fire extinguisher was out of date - found by an observer and noted by the operator.

d. Completed operator round sheets were reviewed in the Shift Manager's office. The following deficiencies were noted:

(1) RS-EU-9212-0004, C-Wing Operator Roundsheet for week ending March 9 - reading # 27 was a weekly reading taken on Mondays. The reading was not taken. Monday readings had been reviewed and signed by the supervisor, Shift Manager, and the STA. Time completed was not recorded for Tuesday.

(2) RS-EU-9212-0008, Utility Operator Roundsheet ending 3-1-98 - two writeovers, number of comment sheets not listed, production manager had not signed.

(3) RS-EU-9212-0008, Utility Operator Roundsheet ending 2-22-98 - one writeover, production manager had not signed.

(4) RS-EU-9212-0008, Utility Operator Roundsheet ending 2-15-98 - production manager and STA had not signed.

(5) RS-EU-9212-0008, Utility Operator Roundsheet ending 2-8-98 - production manager had not signed.

e. RS-EU-9212-009, E-Wing Vacuum Pumps Roundsheets and RS-EU-9212-006, E-Wing Casting Operator Roundsheets did not contain any deficiencies.

f. The chemical operator also completed a weekly checklist. The checklist was completed satisfactorily.

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An O-Wing machinist conducted a valve and electrical breaker/switch alignment using Procedure Y50-37-20-003 in preparation for rolling mill operations. These operations were delayed because the procedure was incorrect. The following deficiencies were noted regarding the alignment checks:

a. Chapter 10 of the *Nuclear Operations Conduct of Operations Manual* stated that to verify manually operated valves open, manipulate in the closed direction only as necessary to remove any slack from the operating mechanism and to verify valve stem movement. However, the machinist turned the handwheels on valves PRM-HV-213 and PRM-HV-858 to close, but only enough to take the slack out of the handwheel. Valve stem movement did not occur.

b. Two valves (PRM-HV-886 and PRM-HV-889) were verified open based only on stem position. In one case, the supervisor concurred. Although Standing Order No. SO-EUO-98-002 stated that observation of the valve stem to determine the valve position was an acceptable technique in determining valve position, the EUO facility manager said the standing order applied to 90° valves such as ball valves. The Building 9212 operations manager said he wrote the standing order with the intent that if you could reach a manually operated valve safely or without creating an additional hazard, you should manipulate it. Otherwise, it was acceptable to use observation of the valve stem to determine its position. Valves PRM-HV-886 and PRM-HV-889 could both be checked open without creating a safety concern. The Building 9215 operations manager, shift manager, and a mentor were asked if observation of the valve stem position was an acceptable technique to verify a valve with a rising stem. All of them said it was. Upon further questioning, the shift manager and mentor said an operator should try to operate the valve if he could.

c. Four valves were required to be "THROTTLE OPEN". The machinist opened each valve slightly and then closed each valve slightly to ensure it was open. However, the EUO facility manager said a throttled valve should be shut all the way, counting the number of turns, and then reopened the same number of turns. Chapter 10 of the *Nuclear Operations Conduct of Operations Manual* stated: "The initial position of a throttled valve normally is determined by observing position indicator's scribe marks or other officially recognized and designated indications. Closing and opening the valve a prescribed number of turns to the prescribed position should be done only when other means of determining the position are unavailable. In such cases, secure the valve in accordance with the approved specific method." Chapter 10 also stated: "Verify throttled valves as being throttled by verifying that the specific device used to secure the valve in position is intact." A restart test engineer said the throttled valves had been set to an optimum position for maintaining fluid level in an associated component. The throttled valves had not been secured in accordance with any approved specific method.

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Another O-Wing machinist conducted a valve alignment check using Procedure 50-37-20-003 the following day, accompanied by a mentor. The following were noted:

a. The supervisor conducted a pre-job brief. A copy of the RWP for entering the Building 9215 basement was brought to the brief and discussed in detail. The RWP for entering O-Wing was not discussed. The previous day, the RWP for the basement was not brought to the brief or discussed in detail.

b. RWP 98-B-0010 was used to perform the valve alignment check. During the pre-job brief, a RADCON technician asked if any climbing above eight feet was involved and the machinist said yes. The RADCON technician said in that case, the RWP needed to be changed. The previous day, the RADCON technician did not attend the pre-job brief and climbing above eight feet was not discussed.

c. RWP-98-B-0010 was reviewed. Step 15 said do not perform any operations/activities/tasks that requires climbing in any overhead area above eight feet unless approved by RADCON on the RWP request form specifying use of RWP 98-B-0010. An RWP request form dated 3/4/98 to perform system alignments for O-Wing Rolling Mill and Sheet and Formed Part Rinse Water System operations was reviewed. One of the questions asked on the form was "Will there be any crawling on or under equipment or climbing in normally inaccessible areas above 8 feet?" The answer was originally "No". However, it was crossed out, marked "Yes", and initialed and dated 3/6/98 (today's date) by the RADCON technician. However, a review of the sign-in sheets for this RWP revealed that both the mentor and the machinist had used this RWP the previous two days. When asked, the mentor said they had to check valve positions in the overhead above 8 feet. Some of the valves checked per Procedure Y50-37-20-003 were in excess of 12 feet above the floor.

d. Upon exiting the boundary control station (BCS), all hand-carried items had to be frisked with both an alpha and a beta-gamma probe. The mentor left the BCS with a 34-page procedure. However, only a couple of pages were frisked.

e. The mentor was assigned to coach and counsel. He helped the machinist locate several valves out of the 20 listed on the checklist. He also reminded the machinist to fill in the date at the top of the checklist. After the machinist contaminated his checklist with oil, the RADCON technician and the mentor discussed how to get it out of the area, while the machinist stood by and listened. The mentor told the machinist how to copy the information from the contaminated checklist to a clean checklist and quoted parts of Chapter 16 of the *Nuclear Operations Conduct of Operations Manual*. He also told the machinist what to enter in the "comments" section of the checklist regarding the transfer of information. The mentor took the completed checklist to the supervisor for his signature. The mentor also told the supervisor how to annotate each of the two separate checklists that were partially completed by each machinist performing the alignment checks. When asked, the production manager said the mentor's role was simply as an observer!

Two O-Wing supervisors and three machinists were observed starting up, operating the rolling mill, billet salt bath, and gantry control system to transform a billet into a plate, and then shutting down these systems. A pre-job brief was conducted by one of the supervisors. Although the pre-job brief was very comprehensive, a PMR on Procedure Y50-37-20-002, which was issued the previous day was not discussed. This PMR affected the performance of the pre-operational checks on a crane used for this activity. Section 3.2.[1] of the procedure required ensuring UCN-10843, *Inspection/Testing of Hoisting Equipment*, was available. While preparing the billet salt bath for operation, a machinist ensured this UCN form was attached to the crane and commenced his pre-operational checks. However, a mentor stopped him and told him that performance of these checks was now listed in Section 4.1 of the procedure. The shift manager was informed of this step being performed out of sequence who noted it in his logbook and authorized continuing the procedure.

During the process of transforming a billet into a rolled plate, communications between the supervisors and machinists were clear and concise. All three procedures used to perform this activity were followed. However, one of the steps in Procedure Y50-37-20-003 required going to Section 4.6 instead of Section 4.4 of Procedure Y50-37-20-055. A mentor said he recognized the problem while reading ahead in Procedure Y50-37-20-003 and told the Production Manager about it. The supervisor was also informed and stopped the procedure until a procedure modification request (PMR) was issued. In addition, when the supervisor checked the exhaust fan control panel to ensure two fans were operating, a piece of tape was attached to the panel near an air flow meter that had "0.7 min" written on it. Switch positions for a damper were also written on the front of the panel in indelible ink.

Two M-Wing daily rounds were observed. The machinist round was performed by a machinist and the machine coolant round was performed by a chemical operator. No procedure covered the rounds. Both round sheets had been revised the previous day. The supervisor provided the revised checksheets and reviewed the changes with the involved workers during the crew briefing. A mentor accompanied the workers during each round. When asked, he said he was going with the machinist and chemical operator because of changes made to the checksheets. The supervisor did not participate.

a. Items 1 through 3 on the round sheet required coolant station cans to be checked "free of solids." CSR-MCS-056, *M Wing Machine Coolant*, was referenced on the round sheet for these items. The can in Item 1 had a small piece (approximately 1/8-inch by 1/4-inch) of solid material in its bottom. The operator initialed the item as being acceptable. The mentor looked in the can but took no action. When asked if the small piece of solid was a problem, the mentor established a 15-feet boundary and notified M-Wing management. During resolution, two machinists were asked what the checksheet requirement "free of solids" meant. They both said the requirement was that no solids could be in the can, but they said they did not understand why it was an NCS

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concern due to the safe geometry of the bottom of the can. Further, they said the cans used to be filled with coolant, but they were no longer allowed to keep coolant in the cans, and the cans should be removed. Subsequently, M-Wing management said the machinist was supposed to have checked the can and removed any solids present. Also, the manager said the cans were still needed and were to be filled with coolant in the event of an emergency. Coolant could then be dipped out for use. When reviewed, CSR-MCS-056 did not prohibit solids in the can, but required inspection of the can and removal of any solids present (Finding A1-OP-01).

b. Item 5 on the round sheet was a weekly check of the stack radiation monitor annunciator panel. Although a weekly check, the round sheet had a daily block for Item 5. The check had been performed earlier in the week. The machinist hesitated and said he was not sure what entry to make for Item 5. The mentor intervened and suggested he read Note 1 on the round sheet that explained "VOID" should be entered for days the test was not performed (Finding A1-OP-01).

c. The machine coolant round sheet had five items. The round sheet had been revised to add notes on how to measure the liquid level in certain vessels. Although there was a block to enter the time the round was started, the operator had not made an entry of start time at the end of the round.

d. Item 2 on the round sheet was to measure the amount of coolant in Trap CVS-F-203. Note 1 specified that one inch of liquid equaled approximately 2 percent fill and that "12-inches or less will ensure the 25% maximum is not violated." The trap was clearly empty, and the operator entered "0" on the round sheet. When asked, the operator measured the distance corresponding to a depth limit line painted on the trap. It corresponded to a depth of 14 inches (28 percent).

e. Item 4 on the round sheet was the amount of liquid in coolant tank CS-F-880, specified to be 200-1000 gallons. One hundred-gallon graduations were marked several inches apart on the side of the tank. The level in the tank fluctuated as the operator tried to read it. He said he estimated the level and entered it on the checksheet.

f. Item 5 on the round sheet was to check the level in a horizontally-positioned solvent storage tank. The tank was required to be at least 10 percent full. A note stated that "5-inches will ensure the 10% minimum is maintained (1" = approximately 2%)." However, a horizontal tank does not fill linear to vertical distance and using the height of the liquid level in the sight glass may yield inaccurate results. The operator used a tape measure to determine the height of the liquid columns as instructed by the supervisor in the crew brief. A graduated piece of tape ran the full length of the sight glass. When checked, the graduations corresponded to the "1-inch = 2%" criteria on the round sheet.

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A machine coolant round sheet completed on March 24, 1998, had an operator entry stating the glass on coolant trap CVS-F-203 needed cleaning or replacement. A supervisor had made an entry on the sheet indicating that a deficiency report "would be filed" to initiate corrective action. Subsequently, the shift manager's deficiency report file was reviewed. The supervisor had prepared and submitted a deficiency report on March 24, 1998.

The Building 9215 LO/TO file was reviewed. Permits were properly completed and filed. A review of seven active lockouts found all in-place with a copy of the permit at the respective lock box. Quarterly reviews had been performed as required.

The Building 9215 administrative control file was reviewed. Five tags, listed as being open in the index, were reviewed. Three could not be located in the file. When asked, the shift manager said the tags had been cleared but not closed on the index sheet.

A chemical supervisor and two chemical operators were observed sampling and transferring process condensate from hold-up tank F-6001 to a storage tank using Procedure Y50-37-98-601. A pre-job brief was satisfactorily conducted by the supervisor using a checklist. In addition, a mentor was assigned to observe the activity in a safety oversight role as a compensatory measure. The following deficiencies were noted:

a. Step 4.7.2.[1].[c] of the procedure required the operator to place the F-6001 inlet valve in "Lockout". However, the valve was already in "Lockout" and he proceeded to the next step. The next step required the operator to place the F-6000 inlet valve in "Open". However, the valve was already in "Open" and he proceeded to the next step. Both a mentor and supervisor were watching the operator perform these steps, but took no action. When asked, the mentor said they should have stopped the procedure and notified the shift manager for resolution even though the valves were in the proper position.

b. Step 4.7.4.[8] required the operator to select a transfer pump. Transfer pump J-6002A was selected and the operator attempted to start the pump as required by the next step. However, there was no indication that the pump started. The operator was going to push the pump start button again, but the mentor stopped him and told the supervisor that the shift manager needed to give permission to attempt to start the pump again.

c. While obtaining samples, step 4.7.3.[3] required the "Request for Analysis" number to be recorded on two sample bottles and a run sheet. This was not performed by the operator. Instead, as the operator proceeded to the next step, he was stopped by the mentor. The mentor said he needed to record that number before proceeding.

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d. The procedure was suspended on Monday at Step 4.7.4.[8]. However, when the procedure was commenced four days later, it was noted that Step 4.7.4.[14] had been performed out of sequence by one of the operators on Monday.

e. As process condensate was being pumped from tank F-6001 to the storage tank, the mentor noticed that the gallons pumped indicated on a totalizer meter did not agree with his calculation of gallons pumped based on capacity of the pump and the pumping time. So he made a comment to the production manager, who told the supervisor, who stopped the operation until the difference could be resolved.

<u>O-Wing Rounds</u>

A pre-job brief and operator rounds were observed in O-Wing. The round sheet had been revised on the Friday before, so the supervisor went with the operator to help with the rounds. The machinists asked for and received a briefing on the new round sheet. One machinist was required to conduct rounds. Three machinists and a supervisor conducted the O-Wing rounds.

The following problems were noted with the O-Wing operator rounds:

a. During the pre-job brief, the supervisor said the machinist should check the status board prior to conducting the round. Standing Order SO-EUO-97-012 required operators to check the status board before and after conducting rounds. The machinist checked the status board half way through the rounds. He did not check it either before or after conducting the round (Finding A1-OP-01).

b. The machinist asked for assistance with more than half of the readings he recorded. The supervisor and a more experienced machinist assisted him a significant amount (Finding A1-OP-01).

c. Item 4 required a once a week annunciator test. The machinist initially entered "NRT"; the supervisor later consulted with the shift manager and changed the entry to "Void". According to Chapter 2.1 of the *Nuclear Operations Conduct of Operations Manual*, "Void" was to be utilized when the facility was not staffed and no work was scheduled. There was no entry defined in the *Nuclear Operation Conduct of Operations Manual* that applied to this condition on the log sheet. Item 8 was similar in that a weekly annunciator test was to be conducted. Item 8 did not have units, min, norm, or max guidance due to omission of these values from the round sheet. The machinist did not know what to enter and left it blank. After the round was completed, the shift manager handwrote unit, min, norm, and max guidance on the round sheet, and the supervisor then entered "Void" in the blank (Finding A1-OP-01).

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d. The machinist entered "stby" in the blanks for several pieces of equipment. Directions at the top of the round sheet stated: "A STBY entry should not be made until the end of the time period for the current round." The shift manager said the "Stby" reading should not have been entered until the end of the shift (Finding A1-OP-01).

e. BSB-K-200B Billet Salt Bath Control Cabinet has a warning sign on it that stated: "Warning - Remove internal jumper from TB2-6 to TB2-8 before placing the bath in operation. See DWG. BSB-E1." The machinist recorded the status of this piece of equipment as "Stby". The shift manager said the 200A and 200B controls only had one alarm line to the PSS office and, therefore, one of the controllers had to be jumpered out. Since the jumper was a long-term condition (i.e., > 6 months), a temporary mod was not appropriate to reflect the condition. The jumpered condition was determined to be the normal condition for BSB-K-200B; a temporary modification must be performed to remove the jumper and place the controller in operation. The shift manager said the controller would be used with the jumper in-place, provided a machinist watched the panel. The shift manager and STA both said "Stby" was the correct status of the equipment.

f. On Control Panel EF-346, a piece of yellow tape with "0.7 min" was attached to the panel above gauge PDI-346A.

g. On item 21, Temperature Recorder for Billet Salt Bath Control Cabinet 200A, the machinist taking the reading was unsure where to obtain the requested reading. One of the other machinists said to write down the SV displayed value. The machinist taking the readings disregarded this input and wrote down the reading from the chart recorder labeled "Temperature Recorder". The *Nuclear Operations Conduct of Operations Manual* stated chart recorders should not be used as sources of data for round sheets.

Completed round sheets, required reading, and standing orders were reviewed for Building 9215. The last quarterly reviews of the required reading files had been conducted on time in March 1998 and December 1997, respectively. The following deficiencies were noted (Findings A1-OP-01):

a. SO-EUO-97-012, Rev. 1, "System Status"; 1 person present day of review had not signed.

b. SO-EUO-98-001,"Evaluation of Procedural and JPA Discrepancies"; 1 person present during previous month had not signed.

c. Required Reading "PA System Usage in the Building 9212 Complex"; 1 mentor present day of review had not signed.

d. Eighteen people had completed past-due required reading, but there was no reason entered for being late.

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e. One person had dated, but not initialed, an entry indicating completion of a required reading.

f. O-Wing Round sheets ending 4-5-98; items 1 and 2 initialed when systems were OOS, Friday readings not taken - all readings listed as "NRT". Per *Nuclear Operations Conduct of Operations Manual,* Chapter 2.1, NRT was for data points inaccessible for monitoring. Correct entry was VOID. Item 7, "Sampler Flow", reading was recorded as 1.04. Tolerance was between 800 and 1200. Recorded reading was not circled in red.

g. O-Wing Round sheet ending 3-29-98; Friday readings were not taken. All entries listed as NRT. Comment written on back of Comment Sheet. Comment Sheet stated to "Duplicate this comment sheet as needed for additional comments."

h. O-Wing Round sheet ending 3-22-98; 5 out of 10 items 1 and 2 were initialed and not circled for OOS equipment.

i. Generally, all corrective actions listed on the comment section of each Round sheet were "Notified Supervisor".

j. M-Wing Machinist Round sheet ending 3-1-98; item 5 requires an Annunciator Test to be performed on Mondays. The round sheet was initialed on Monday, Tuesday, and Thursday were "N/A", Wednesday and Friday were "-". A similar problem was noted on the O-Wing Round sheet where the weekly entry was entered as "Void".

k. M-Wing Machine Cleaner Round sheet; no comments.

l. M-Wing Shift Supervisor Round sheet ending 3-8-98; one writeover.

m. M-Wing Machine Coolant System Round sheet ending 3-8-98; one writeover.

A pre-job brief and operations of the high capacity evaporator were observed. After initial operations, the evaporator was placed in temporary shutdown and a shift turnover to the oncoming shift occurred. The on-coming shift restarted the evaporator and performed a full shutdown. Two operators, a B-1 lab operator, and a supervisor were required to operate the high capacity evaporator. Two operators, a B-1 lab operator, a supervisor, and the production manager were present for both the initial and subsequent operations. The shift manager and the functional manager were present intermittently during the second operation. The supervisor answered occasional questions during the first evolution. The supervisor and the production manager were more involved in the process during the second operation answering frequent questions. The only deficiency noted was during the second evolution. The operator started directly into the procedure without performing a prerequisite, which required him to fill out the run sheet. The supervisor caught the error and corrected the operator on the spot.

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An O-Wing supervisor and three machinists were observed hydroforming a part using three procedures. During this activity, start-up, operation, and shutdown of the hydroform, gantry control system, and a convection oven were also observed. A pre-job brief was conducted satisfactorily by the supervisor using a checklist, including a review of a PMR that was effective the previous day. In addition, two mentors were assigned to observe the activity in a safety oversight role as a compensatory measure. The following deficiencies were noted:

a. Step 3.3.[5] of Procedure Y50-37-20-055 required the operator to ensure that neither the salt bath sludge pans nor the inner liners would exceed the maximum allowable oxide accumulation specified in the CSR during the shift by observing data entries on Appendix B to the procedure. (Actually, a copy of Appendix B was placed in the operating area and the operators recorded data on it whenever the salt bath was used.) Although the operator performed this step, the copy of Appendix B in use was not the latest version. The PMR that was made effective the previous day added another requirement to Appendix B.

b. Step 4.1.3.[2] of Procedure Y50-37-20-055 required the supervisor to type "Show System" on a computer and press {Return}. Then, as the screen started scrolling, press {F1} to stop scrolling so he could read the entries before they scrolled off screen. After reading the entries, the next step in the procedure required the supervisor to press the {F1} key to start scrolling again so that the remaining entries would be displayed on the computer screen. The supervisor did not press the {F1} key initially. As a result, some of the entries scrolled off the computer screen before the supervisor could read them. The supervisor realized his mistake and called the shift manager for resolution of the problem. The next step in the procedure required the operator to perform an action, and the shift manager told the operator to continue with the next step. The mentor told the operator he should press {F1} twice as required by the procedure, since he could follow the procedure literally, before he continued with the next step. Upon completion of this activity, the mentor went to the shift manager's office to discuss this situation. Discussion with the shift manager revealed that the shift manager did not fully understand the situation. The shift manager said that based on the mentor's explanation of what had occurred, he would have taken other actions. Contributing to the problem was the fact that the shift manager's controlled copy of the procedure was not the latest version of the procedure. It had an effective date five days earlier. The latest version had an effective date of the previous day and the step in question had been changed by a PMR effective the previous day. In addition, standing order SO-EUO-98-001 required the shift manager to discuss procedure discrepancies with the operations manager and then document the decision of the operations manager in the shift manager's log. This problem occurred at approximately 1100. However, as of 1430, there was no entry in the shift manager's log pertaining to this problem.

c. Step 4.8.[5] of Procedure Y50-37-20-055 required the operator to shut a door on the convection oven and observe the message "<part number> Successful" appears on a bar code station screen. However, the message "Timeout" appeared instead. The supervisor called the shift manager for resolution and with the operations manager's concurrence, the activity continued. This problem occurred at approximately 1230. However, as of 1430, there was no entry in the shift manager's log pertaining to this problem.

d. Procedure Y50-37-20-055 did not allow the operator to shutdown the sheet rinse system (Step 4.4.[36], which was part of the shutdown of the gantry control system) without performing the other steps in that section of the procedure, which was unnecessary. As the supervisor and operator proceeded to perform this step anyway, the mentor stopped them since the procedure could not be followed as written. The supervisor called the shift manager for resolution and the problem was resolved by the operations manager. This problem occurred at approximately 1400. However, as of 1430, there was no entry in the shift manager's log pertaining to this problem. The last entry was made in the shift manager's log at 1350.

An M-Wing supervisor round was observed. The supervisor completed EU-9215-RS-003, *M-Wing Shift Supervisor Roundsheet* as required. The supervisor was thorough in conducting the round. When checking the criticality alarm detectors, he climbed the ladders to more clearly see the required meter readings and to check the expiration dates on the equipment calibration stickers. He did not allow operating personnel to enter M-Wing until differential pressures across the combined prefilter-HEPA filters were verified to be within the required range. At the completion of the observed part of the round, the supervisor notified the shift manager that facility status was acceptable and made a corresponding entry in the supervisor's logbook.

Following the round, those checks designated on the round sheet with "<OSR>" were reviewed against OSR surveillance requirement 4.3.1.1 in Y/MA-7291, *The Operations Safety Requirements for the 9215 Complex Enriched Uranium Operations*. During periods when machining chips were unsecured, the OSR required a surveillance of the differential pressure across the combined prefilter-HEPA filters "SHIFTLY," defined as every 12 hours. The round sheet did not identify a requirement for a recheck of this differential pressure every 12 hours (e.g., when overtime was worked at the end of a day shift). When asked how the requirement was met, the shift manager said his office would require the round to be repeated to ensure the OSR surveillance requirement was met. He also cited supervisory training on OSRs.

An M-Wing machine cleaner round was observed. Two machine cleaners performed the round and recorded results on EU-9215-RS-004, *M-Wing Machine Cleaner Roundsheet*. The round was performed in a comprehensive manner, and the round sheet was filled out completely. The following were noted:

a. Item 6 on the round sheet was to check the level of liquid in two safe bottles. The required condition was that the bottles be three-quarters full or less. The opaque bottles were not marked to indicate the fill limit. The round sheet did not require the actual level to be recorded; instead, initials were entered to document the level was within limits. The machine cleaners determined acceptability by lifting the bottles and stating they were less than half full. When asked, they said the bottles were normally emptied when approximately one-half full, and they used a flashlight to look in the mouth of the bottles when the level was nearing the limit.

b. Item 7 on the round sheet was to inspect the fill level in three trap collectors on the accountable vacuum system. The machine cleaners said this item had been added to the round sheet the prior day. The basement-located trap collectors had a detection collar mounted in the top that gave an alarm when the level reached the bottom of the approximately 1-1/2-inch wide collar. The maximum allowed level listed on the round sheet was "Top of level detection collar," a level representing an alarm condition. When asked, the shift technical advisor said the maximum should be the bottom of the level detection collar.

Two machinists and an engineering assistant were observed performing deposit surveys in the basement of 9215 M-Wing. Category II Procedure Y50-37-018 was used during the observation. Surveys were performed using a gamma monitor and a data pack. The data pack was downloaded to a personal computer (PC) periodically. The procedure required surveys of various locations on ventilation and piping systems. Each location was designated with a permanently mounted bar code. The machinists performed each survey in accordance with the procedure. The following were noted:

a. All sections of Procedure Y50-37-018 required at-hand use of the procedure, including those for transferring data from the data pack to the computer, using the computer, battery charging, and generating printed reports of results. In most cases, program software provided on-screen directions that were duplicated by the procedure. Eliminating or condensing those sections of the procedure not requiring step-by-step direction would increase its useability.

b. The procedure was written such that it allowed little field flexibility when needed. For example, Steps 4.4[13] and [14] were to press the "Enter" button on the data pack and then position the detector against the location to be measured. The data pack allowed five seconds from the time the "Enter" button was pushed until the count started. In areas where the location to be surveyed was high overhead, five seconds was not adequate to achieve proper positioning. To compensate, the machinist with the monitor (attached to an approx. 15 ft. long pole) pre-positioned the monitor near (but not on) the location, the other machinist pushed the "Enter" button, and the first machinist then moved the monitor into position. Such action placed excess stress on the arms and back of the machinist holding the monitor, increasing risk of injury. When asked, the engineering assistant said he had requested mentor assistance with getting the procedure changed to allow the machinist to preposition the monitor and then press the "Enter" button.

ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-19)	Date: April 14, 1998

A Product Certification supervisor and two operators were observed performing a dimensional inspection of a mock-up weapons part using a Moore Measuring Machine. The Product Certification Operations Manager was present for most of the observation. A mentor was not present.

a. The Special Instruction section of the applicable inspection form required the part to be cleaned prior to placing it on the measuring machine. After inspection, it also required an application of a protective coating on the part prior to replacing it back in the storage container. The operating procedure used by the operators performing the inspection, Procedure Y50-55-DI-H002, *Moore Measuring Machine Operation in H-2 Fissile Inspection Area*, did not require cleaning or applying a protective coating to the part. The operator actually cleaned the part. Both operators said they would apply the protective coating to the part after the dimensional inspection was complete.

b. The applicable inspection form allowed only GW Cutting Coolant, Mil-C-Oil, or Rust Veto 4214-W, to be applied to the part as a protective coating. The squeeze bottle of liquid available in the work area to apply as a protective coating was labeled "SHELL VITREA OIL." Four other squeeze bottles stored in the area flammable storage cabinet were labeled the same. The supervisor could not find anything to show that what was in the squeeze bottles was the same as required by the inspection form. The supervisor told the operators to leave the part on the measuring machine until he could ensure the correct substance was used for the protective coating.

c. Subsequent research by the supervisor revealed the following information:

(1) The three protective coating substances listed on the inspection form were obtained from document number 00-Y-339, *Controlled Process Material List*, approved by the program management organization.

(2) The listed buyer catalog number for GW Cutting coolant on this document crossed over to "Shell Vitrea 46" on the last <u>superseded</u> stores catalog.

(3) This same buyer catalog number had been deleted from the <u>current</u> stores catalog. The DI operations manager said this deletion was done without the permission of the product management organization, even though stores procedures required them to obtain their permission before deleting or changing products. He said stores would add the catalog number and associated information back on the list. He also said the program management organization would change the listing in their Controlled Process Material List from "GW Cutting coolant" to "Shell Vitrea 46" so the list name would reflect what was being used in the shops.

ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-19)	Date: April 14, 1998

d. The one-liter plastic bottle catching the drain lubricating oil for the machine stack was full and oil was backing up in the drain tube.

An O-Wing supervisor, machinist, and EUTO material clerk were observed shearing scrap metal using JPA-OW-SCS-0001. A pre-job brief was conducted satisfactorily by the supervisor using a checklist. Before proceeding to the work area, the supervisor checked the status board in the shift manager's office and got permission from the shift manager to perform the activity. In addition, a mentor was assigned in a safety oversight role as a compensatory measure. The mentor intervened during one step of the procedure when an STA allowed the material clerk to look at the STA's information copy of the procedure so that the material clerk could perform the next step in the JPA. The mentor told the material clerk to use a working copy of the JPA instead.

A pre-job brief for Procedure Y50-37-65-707 was observed. Two operators, a supervisor, and a mentor are required to perform the procedure. Also present were a process engineer, an STA, and a DOE Facility Representative. The supervisor did a good job with the brief, asked questions of the operators, and received correct responses. The task, as briefed, was being performed in accordance with a memorandum titled *Control of EUO Procedure and JPA Reviews and Reviews During Cold Start Operations* from L.A. Felton, which allowed walkdowns, practice operations, and DU surrogate material operations. The procedure being performed was for a practice operation, which allowed field revisions and was not approved. After the briefing and after conversations between the ORR team and EUO Management, it was decided the procedure required further revision prior to performance.

On the following day, the procedure was re-scheduled for performance. Performance of the procedure for the ORR team was postponed again at management's request.

On the third day the evolution was performed as scheduled. The material briquetted was stainless steel Brillo pads. Two operators, a supervisor, and a mentor were required for performance of the procedure. The DOE Facility Rep was also present. The operators were conscientious, knowledgeable, and made good use of repeat-backs. A debrief was held afterwards and the participants critically examined their performance. The following deficiencies were noted with performance of the procedure:

a. Prerequisite steps ensuring the oxygen monitors and the argon drying hood heaters are energized were not included in the latest revision of the procedure. The mentor noted it in the post job brief and stated a typing error had caused the omission.

b. In step 4.9.2 [1], CP-FIC-318, Loading Hood Argon Flow is labeled CP-FIC-318, Loading Box Argon Flow in the field. This discrepancy was not noted by the procedure performers.

c. The stainless steel pads were initially loaded into one cylinder of a two-cylinder dolly which was labeled "Mockup". When asked, the mentor stated the stainless steel pads were surrogate materials. Two criticality safety engineers and a criticality safety group leader were contacted about the stainless steel pads. One criticality safety engineer agreed the stainless steel pads were surrogate materials. One criticality safety engineer and the criticality safety group leader stated they were not surrogate materials and also should not have been labeled as mockup materials.

The mentor intervened more than 10 times during performance of the procedure. Items which required his intervention included correcting skipped steps, directing performance of bulleted items which were not sequenced logically, and an alarm response. The operators brought up all these items during the debrief and they were discussed effectively.

Pre-job brief and performance of Y50-37-98-667 and JPA-EU-0010 were observed. Two operators, a mentor, and a supervisor were required for the operations; also present were the production engineer and a DOE Facility Representative. The supervisor intervened one time during performance of Y50-37-98-667, and the mentor intervened one time during performance of the JPA. Both operators performing the operations were conscientious and knowledgeable about the operations and exhibited excellent rad-con awareness. The following problems were noted with performance of the operations:

a. The JPA directed the operator to add a gasket to the safe bottle prior to placing the bottle on the rocker. The JPA did not direct the operator to remove the gasket(s) prior to placing the bottle in storage. Leaving the gasket in place would most likely prevent the bottle from venting properly.

b. The bottle leaked with one gasket while being rocked during the JPA. The supervisor directed the operator to stop the operation and place a second gasket on the bottle. The production engineer said they had experienced the same problem during the dry run. The JPA only directed one gasket to be installed.

c. The operator had to stand adjacent (within inches) of the rocker to turn it on. The rocker pivoted back and forth on its lower center, and the rocker end piece passed up and down immediately adjacent to the operator's leg region. With the on/off switch located so close to the machine, the potential existed for the rocker to impact the operator's lower extremities when it was turned on.

d. The sampling station had criticality safety signage; however, the JPA did not reference any CSRs. There was no guidance on spacing; however, the production manager said the trays utilized at the station had separation requirements.

Three chemical operators and a supervisor in 9212 C-1 wing were observed performing glovebox operations using Procedure Y50-37-98-668. A pre-job brief was conducted by the supervisor during which the status of criticality alarms, continuous air monitors, calibration, etc. were reviewed. Precautions and Limitations and Lessons Learned from prior practice operations were reviewed.

RADCON support and a mentor, assigned to the job as safety oversight, also participated in the pre-job brief and in the subsequent evolution.

Certifications of involved personnel were verified to be current and as-required for the assigned job. The operation was executed using hands-on simulation and appropriate cues. For example, the operator reviewed the status of an accountability scale, then set an empty can to be weighed on the scale, and the weight to be used for the simulation was provided by the supervisor on a form titled *Deviations Documented for C-1 Receiving Walkdowns/Dry-Runs*. The deviation sheet was dated for its day of use, but did not indicate management approval.

Deviation #2 indicated the system alignment checklist for the Code 80 Glovebox was current. When the shift manager was contacted for determination of system alignment status, he indicated the actual checklist was current. No deviation was needed. The completed checklist in the shift manager's office was from a prior revision of Procedure Y50-37-98-668. The shift manager verified there had been no changes in the checklist before authorizing work to begin.

In general, operators were diligent in complying with step-by-step requirements of the Category II procedure. One operator (Operator A) read the action step while the other (Operator B) performed the step. On two steps, Operator A stopped Operator B when it appeared incorrect actions were about to be taken. The mentor intervened twice during the evolution, first when a two-part step was performed in reverse order. He notified the workers and supervisor of the error and then observed as response actions were taken. The supervisor stopped work and called the shift manager for approval before resuming operations. The second intervention was when an operator used scissors in an unsafe manner to remove tape from a source container. Some actions were taken, but were not specified as action steps in the procedure:

a. Preparation of sample bottles and insertion in the glove box.

b. Wiping down of container prior to removal from the access airlock was designated as a Precaution in Section 2, but not listed as action steps in the Performance Activities, Section 4.

c. Replacing the lid on the V-Blender between batches was performed, consistent with Precaution 2.F, but no action steps told the operator to replace the lid.

d. A funnel was not described in the procedure, to assist with pouring screened source material into the V-Blender.

e. Preparation of Request for Analysis of samples.

ORR ASSESSMENT FORM

Functional Area: OPERATIONS (OP)	Core Objective Number: (CO-19)	Date: April 14, 1998

The lead operator performed all manipulations in the glovebox. Due to the design of the box, materials had to be moved to/from one level to another, approximately 12 inches apart. Although not a problem when using empty cans during the simulation, handling of cans containing up to 20 kilogram of material will be difficult for smaller employees who have to work with their arms fully extended.

As stated above, one precaution was to clean containers prior to removal from the access airlock. The operator performed this cleaning in the airlock, except that on two occasions, the bottom of the can (a location susceptible to significant contamination) was not cleaned until the can was removed and was being set on a ledge outside the airlock.

Conclusion:

Pre-job briefs were particularly noteworthy, as was the positive attitude and desire to succeed demonstrated by the operating personnel. Based on the records reviewed, personnel interviewed, and evolutions observed, the conduct of operations is adequate in most areas. However, the quality of rounds and the use of round sheets does not always ensure that facility status is known and understood. In addition, mentors were instrumental in ensuring operations personnel complied with procedures. With the mentors present as a compensatory measure, and when the prestart finding in this area (Finding A1-OP-01) is resolved, the criteria for this core objective will be met.

Inspected by: J. R. Sprenkle W. E. Hill	Approved by: [signature] ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-20 and -29)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Management establishes and communicates a commitment to safety and environmental compliance.

2. Safety programs are reported, prioritized, and tracked in a tracking system.

3. Operations personnel exhibit awareness of, and commitment to, applicable requirements from OSRs, CSRs, environmental permits, radiological work permits, and operating procedures.

Personnel contacted/position:

EUO Facility Manager
EUO Deputy Facility Manager
Vice President for Restart Operations
Emergency Preparedness Manager

Records & other documents reviewed:

Safety meeting records
Issues of *Safety Times*

Evolutions/operations witnessed:

None

Discussion:

The vice president said they had increased emphasis on communicating a safety message to the people in EUO. They were also working hard to get people back to work if accidents did occur. He said case management had been beneficial in returning people to work as quickly as possible. He also said that he had initiated a program where supervisors of injured employees had to explain at his EUO facility manager's staff meeting why the accident occurred.

The EUO facility manager reiterated the items identified by the vice president. He also said that he had personally conducted meetings with all EUO personnel on a Hanford acid event and the K-25 fatality of a year ago. He also said he periodically conducts one of the monthly safety meetings for EUO personnel. He also said there were monthly site-level safety meetings, but these could be improved by placing more emphasis on them and requiring attendance.

The EUO deputy facility manager mentioned the EUO safety meetings discussed above and the new requirement to have supervisors explain accidents at staff meetings.

All three of the above individuals mentioned the series of all-hands safety meetings recently conducted by the plant manager and the deputy vice president for defense programs.

The emergency preparedness manager said the division manager conducted four safety meetings with all EUO personnel last year (eight sessions to conduct each meeting). She also said she distributed a copy of *Safety Times*, a commercially available safety bulletin, six times each year.

A review of all of the findings and conclusions contained in the following functional areas was conducted by the Management functional area team:

a. Training

b. Criticality Safety

c. Safety Documentation

d. Management

As a result of this review, there was an identified weakness in the area of disciplined operations (Finding A1-MG-04). There was a demonstrated lack of rigor associated with documenting bases or methodologies to support conclusions that impacted safety decisions. Additionally, when training deficiencies were identified, actions to correct the deficiencies were only taken in the area of "paper" fixes without taking appropriate compensatory measures to address the situation. Further, the corrective action closure process was found to be inadequate to support restart of Phase A1 processes (Finding A1-MG-03).

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-20 and -29)	Date: April 11, 1998

Conclusion:

The core objectives associated with this functional area have not been met. The current management commitment to disciplined operations, particularly int he areas described above, does not support restart of Phase A1 processes. The closure of the prestart finding associated with these core objectives, along with the prestart issues addressing programmatic disciplined operations deficiencies, will meet these core objectives and support restart of Phase A1 processes.

Inspected by: R. D. Shaffer	Approved by: ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-21)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. The EUO emergency drill program has drills that cover the hazards identified in the BIOs.

2. Facility personnel are trained on the emergency response program.

3. Scheduled drills have been completed with satisfactory results.

4. Drill deficiencies have been adequately addressed.

Personnel contacted/position:

Emergency Management Program Operations Manager
Drill Director
Facility Drill Coordinator
Furnace Operator Controller
Shift Manager Controller
Injured Worker Controller
Incident Commander Controller
EUO Drill Coordinator
EUO Training Manager

Records & other documents reviewed:

Procedure EM-125, *Emergency Management Drills*
Fire Evacuation and Accountability Drill Package conducted February 10, 1998
Criticality Evacuation and Accountability Drill Package conducted December 2, 1997
Criticality Evaluation and Accountability Drill Package conducted July 22, 1997
Completed package for 9212 Building Fire (Limited External) Drill conducted January 6, 1998
Draft package for 9212 Contaminated-Injured Work (Limited External) Drill conducted January 29, 1998
Procedure EM-127, *Oak Ridge Reservation Building/Facility Emergency Program*
F. P. Gustavson memo dated January 16, 1998, *Emergency Drills and Exercises*
Table entitled *Status of Operational Emergencies Development for 9212 Credible Accident Scenarios*

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-21)	Date: April 14, 1998

Table entitled *Status of Operational Emergencies Development for 9215 Credible Accident Scenarios*
Y/MA-7366, *Enriched Uranium Operations (EUO) Drill Program Plan*
EMPO-500, *Oak Ridge Reservation Emergency Plan*
Injured/Contaminated Worker Drill Guide

Evolutions/operations witnessed:

EUO Holden Furnace explosion drill, complicated by a contaminated, injured worker
Pre-drill brief
Drill debrief

Discussion:

Procedure EM-125 was reviewed to determine requirements prior to record review and drill observation.

The Emergency Management Program Operations (EMPO) manager provided a table for Buildings 9212 and 9215 that showed the current status of operational emergencies development for credible accident scenarios. For Building 9212, five of the ten BIO-related events had accident scenarios developed. For Building 9215, four of seven BIO-related events had accident scenarios developed (Finding A1-DR-01).

Procedure EM-125 required the EMPO manager to compile a master emergency management drill schedule. The EMPO manager said a master emergency management drill schedule did not exist. During this discussion, he said he had committed to have a schedule before EUO startup.

Two criticality/accountability drills and one fire evacuation/accountability drill were conducted by emergency management (EM) personnel on EUO facilities within the last 12 months. Neither criticality drill scenario involved equipment or transportation and medical treatment of personnel exposed to high radiation. Two drill controllers utilized for one criticality drill were not qualified in accordance with the requirements of EMPO-500. None of the associated drill packages stated whether the drill was satisfactory or unsatisfactory (Finding A1-DR-02). EUO personnel participated in all three EM emergency drills conducted within the last 12 months. Each of the three EUO emergency drills conducted in the last 12 months utilized drill packages written uniquely for each drill (Finding A1-DR-01).

The EMPO manager said there was no method to ensure all EM drill deficiencies were adequately addressed. However, deficiencies were identified in all three drill packages. The drill package for the December 2, 1997, criticality/accountability drill listed six drill objectives. The drill report stated that two of the six objectives were not met (Finding A1-DR-01).

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Functional Area: DRILLS (DR)	Core Objective Number: (CO-21)	Date: April 14, 1998

Procedure EM-125, paragraph A.11 stated to refer to Appendix A of the procedure for an explanation of the makeup of a drill package. The same paragraph listed the minimum items that must be included in a drill package. Appendix A did not include all the minimum items. The drill packages for the three EM drills conducted at EUO facilities met the requirements of Appendix A of Procedure EM-125.

Procedure EM-125 did not describe a method or designate one individual authorized to approve start of an EM emergency drill. This was discussed with the EMPO manager who said he would change the procedure to require a start approval signature.

Twenty-one of 255 EUO personnel had not been trained on TMS Module 19370, *Oak Ridge Reservation Employee Emergency Response Program* (Finding A1-DR-03).

Procedure EM-125 stated that it did not apply to facility operational drills used for training and certifying operators. An F. P. Gustavson memorandum, dated January 16, 1998, that discussed emergency drills stated operational drills that exceed in scope the capability of the facility/building staff must be coordinated with EMPO and conducted in accordance with the emergency drill and exercise program. The EUO drill program plan stated the EUO drill program included emergency drills for major events, such as criticality accidents. EUO drill requirements and EM drill requirements were not integrated. This was discussed with the EUO Training Manager, EUO Drill Coordinator, and the EMPO Manager, all of whom agreed the problem needed to be resolved.

The EMPO manager was interviewed. He demonstrated a satisfactory level of knowledge of the EM drill program. His description of methods he used to select drill scenarios and drill participants was adequate.

A contaminated, injured worker emergency drill, including the pre-drill brief and drill debrief, was observed in Building 9212. The following items were noted:

a. The projection of the transparencies used during the pre-drill brief was too small for participants in the back rows to read.

b. The scenario referenced Procedure Y50-37-92-403, *Gas Fired Holden Furnace*. It stated that the area supervisor would direct the operator to commence Steps VI.D, "Firing Furnace," then the operator would simulate performing Step VI.D.1a. A copy of Procedure 50-37-92-403 with an effective date of April 28, 1988, was obtained by the observer from the document management center. However, the drill monitor used a draft copy of Procedure Y50-37-92-403. The drill monitor told the operator that he was supposed to simulate operation of the Holden Gas Furnace. The drill monitor led the operator through the furnace startup using the draft procedure. The drill monitor started with Step 4.1.1.[1] and walked the operator through the next five or six steps, telling the operator that he had done whatever the step said.

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-21)	Date: April 14, 1998

c. The scenario stated that the green run light for the blower energized, but the blower failed to start. After opening the furnace door and pressing the ignition switch, the purge sequence/interlocks were simulated to have failed, allowing the pilot lights to ignite before the gases were purged from the furnace. This caused an explosion with no subsequent fire. However, these conditions were not simulated. Instead, the drill monitor showed the observer a cue card that stated you could smell rotten eggs. At this point, the operator simulated operating two switches and evacuated the area.

d. As the operator left the room, the drill monitor showed the operator the cue card representing an explosion, and then told him he heard a loud explosion, his ears were ringing, and there was some smoke in the room but no visible fire. He was not told he was injured. When his supervisor arrived, she called the shift manager on the radio and said she had one operator who was injured. After asking the operator what his injuries were, the operator said he could not walk.

e. While standing just outside the room, but inside the high contamination area, the operator looked at a phone and told the drill monitor that he would dial 911 or notify his supervisor. The operator's supervisor arrived about the same time. The drill monitor said OK, tell the supervisor.

f. Over the radio, the shift manager asked the supervisor if there was a fire or other people in the area. The drill monitor told the supervisor there was no fire or other people in the area, instead of allowing the supervisor to determine the information for herself.

g. A radiological control (RADCON) technician frisked the Holden Furnace operator. He asked the drill monitor, "Am I seeing anything here?" The drill monitor said that, for drill purposes, he was not contaminated, instead of allowing the RADCON technician to complete the frisk and find that out for himself.

h. The operator sat on a bench in a radiological buffer Areas (RBA) for approximately 35 minutes before being told by a drill monitor that he was not injured. During this 35 minute period, he told several people he was going in out of consciousness and was injured.

i. The drill scenario called for a simulated evacuation of Building 9212, but no announcement of this simulation was made over the PA system. Lack of this information confused the incident controller, plus complicating the injured worker scene, because of the number of people walking by not involved in the drill.

j. The following communication deficiencies were noted:

(1) It was communicated to both the shift manager and the incident commander that there were two injured personnel, both in a high contamination area. There was actually only one injured person.

(2) The incident commander believed the explosion could have created criticality concerns in the area where the injured personnel were thought to be located. This caused a 12-minute delay in emergency personnel arriving at the scene of the injured person, while NCS personnel gathered unneeded information.

(3) Information was being received by radio in the shift manager's office on three different radio nets, resulting in confusion on what information was coming from where.

k. Twelve minutes elapsed from the time the shift manager's office called 911 until the ambulance arrived at Building 9212. An additional 21 minutes elapsed before the Emergency Medical Technicians (EMT) were allowed to enter.

l. The injured worker had a compound fracture of the lower right arm, became unconscious, and went into shock. She received no medical treatment from anyone from the time she was injured until the drill secured, a 40-minute time interval.

m. The incident commander would not send in the EMT personnel to aid the injured worker until the shift technical advisor (STA) at the command post, representing the shift manager, granted permission. The STA would not grant permission until RADCON, NCS, and security granted approval.

n. Preparation of the injured worker was observed prior to initiation of the exercise. The make-up man did a professional job preparing the victim with a realistic-looking compound fracture of the right forearm. When the exercise was initiated, the patient was wearing realistic anticontamination clothing for her prescribed work area, except that no shoe scuffs had been provided by drill planners and none were worn.

o. The injured worker controller (IWC) arrived at the scene just before the exercise commenced. When asked, she said she did not have all the training required for unescorted MAA access. She did not observe any pre-exercise preparations.

p. The patient did a credible job yelling for help and collapsing in the hall at the designated location. As the exercise progressed, the IWC had to remind the worker that she was supposed to be unconscious, and she should not be talking or moving her head.

Functional Area: DRILLS (DR)	Core Objective Number: (CO-21)	Date: April 14, 1998

q. The RADCON technician who surveyed the patient for beta/gamma contamination did so at a rate of approximately 4-5 inches per second, instead of the 1-2 inches per second prescribed in Radiological Worker II training.

r. An EUO supervisor attended the patient throughout the exercise. He stayed with her and repeatedly radioed for ambulance assistance.

s. There was no pedestrian traffic control in the vicinity of the patient. EUO workers passed within 12 inches of the contaminated patient, some carrying work-related equipment. The attending RADCON technicians used a maslin mop to attend to potential spread of contamination.

t. PA announcements concerning status of the casualty were not made over the PA system by the shift manager's office.

u. A sign above the alpha friskers at the exit from the high contamination area required frisking hands, head, feet, and hand-carried items. The drill monitor only frisked the front and back page of the procedure and turbo-frisked approximately six pages inside the folder.

v. The sign at the exit from the high contamination area also required directly proceeding to the PCM-2 to perform a whole body frisk. The drill monitor said it was not required if you were not leaving the RBA. However, both the operator and a RADCON technician said that everyone must perform a whole-body frisk with the PCM-2 after exiting a contamination area before going anywhere else in the RBA.

w. No facility drill participants were at the post-drill critique.

x. Most of the post-drill critique consisted of reviewing the drill objectives listed in the drill guide. None of the procedures referred to in the drill objectives were available to use to determine if the objectives were met.

y. Programmatic problems uncovered by analyzing the drill deficiencies were not discussed until brought up by DOE observers. Questions about drill programmatic problems brought up by DOE observers during the debrief did not allow the ORR team to determine if the debrief participants would have independently identified these problems.

Emergency management personnel and the ORR team graded the drill as unsatisfactory (Finding A1-DR-01).

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Functional Area: DRILLS (DR)	Core Objective Number: (CO-21)	Date: April 14, 1998

Conclusion:

The emergency drill program did not meet any of the criteria of this core objective.

Inspected by: F. E. Freeman	Approved by: ______ ORR Team Manager Date: 4/14/98

Form 1

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ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. The EUO operations drill program is documented.

2. Credible routine operations drill scenarios involving processes are identified.

3. Drills and exercises have been developed for each process scenario.

4. Records show that a representative sample of drills and exercises have been conducted with satisfactory results.

5. Drills and exercises have been conducted for credible accident scenarios for high-risk processes.

Personnel contacted/position:

EUO Drill Coordinator
Building 9212 Facility Drill Coordinator
Building 9212 Drill Monitors
C-1 Wing Supervisor
C-1 Chemical Operators
Drill Scenario Developers
Building 9215 Facility Drill Coordinator
Building 9215 Drill Monitors
M-Wing Supervisor
M-Wing Machinists

Records & other documents reviewed:

Conduct of Training Manual, Y-12 Nuclear Operations, *Development of Drill Guides*
Conduct of Training Manual, Y-12 Nuclear Operations, *Conduct of Drills*
Drill Guide 37-0084, *E-Wing Dry Vacuum Trap Fire*
Drill Guide 37-0018, *High Capacity Fume-Off Reaction*
Y/MA-7366, *Enriched Uranium Operations (EUO) Drill Program Plan*

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Facilities*
EUO list of trained drill monitors
List of approved drill scenarios for Buildings 9212 and 9215
Procedure EM-125, *Emergency Management Drills*
Drill Guide 37-0009, *High Capacity Evaporator Pump Diaphragm Failure*
Drill Guide 37-0001, *Chip Fire Cleaning and Briquetting*
Drill Guide 37-0002, *Process Machine Chip Fire, 9215 M/O Wing*
Drill Guide 37-0003, *Uranium Chip Metal Fire (in canister), 9215 M/O Wing*
Drill Guide 37-0005, *Chip Fire During Casting*
Drill Guide 37-0006, *Full Loss of Ventilation, 9215 M/O Wing*
Drill Guide 37-0008, *Accountable Vacuum System Trap Fire, 9215 M/O Wing*
Drill Guide 37-0010, *1021 Tray Dissolver Rapid Chemical Reaction*
Drill Guide 37-0016, *Contaminated Injured Worker, 9215 M/O Wing*
Drill Package 37-0001 dated 2/6/98
Drill Package 37-0002 dated 2/11/98
Drill Package 37-0003 dated 2/17/98
Drill Package 37-0005 dated 2/16/98
Drill Package 37-0006 dated 2/5/98
Drill Package 37-0006 dated 2/6/98
Drill Package 37-0008 dated 2/3/98
Drill Package 37-0008 dated 2/18/98
Drill Package 37-0010 dated 2/12/98
Drill Package 37-0016 dated 2/4/98
Drill Package 37-0016 dated 2/10/98
Fire Department Fire Hose Drill dated 2/24/98
Emergency Operating Procedure Y55-37-001, *Responses to Fires Involving Uranium Chips and Fines*
Y-12 Procedure Y10-102, *Technical Procedure Process Control*

Evolutions/operations witnessed:

1. High capacity evaporator pump diaphragm failure during routine operations drill in Building 9212, including pre-drill brief and post-drill debrief.

2. Uranium metal chip fire at a lathe in the M-Wing of Building 9215, including pre-drill brief and post-drill debrief.

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

Discussion:

Documentation of the EUO operations drill program was formalized and approved.

The EUO operations drill program was reviewed against DOE Order 5480.20A and the *Y-12 Nuclear Operations Conduct of Training Manual*. The following deficiencies were noted:

a. Procedure change directives, criticality safety approvals, and JPAs were not routed to the organization drill coordinator, as required by Section 4.6 of the *Y-12 Nuclear Operations Conduct of Training Manual*.

b. A formal system did not exist to ensure drill lessons learned were promptly addressed.

Y/MS-7366 discussed EUO coordinating with external organizations for EUO emergency drills. Emergency drill responsibilities were assigned to the Y-12 Emergency Management Organization by Procedure EM-125.

A routine operations drill involving the failure of a high capacity evaporator pump diaphragm, which resulted in an operator being sprayed with acidic, radioactive liquid, was observed. The pre-drill brief and the post-drill debrief were also observed. The following items were noted:

a. The building facility drill coordinator conducted the pre-drill brief. He did not brief several pieces of information. However, the drill monitors asked questions about the missed information, resulting in all drill information being covered. There was good dialogue between the drill coordinator and the drill monitors.

b. The high capacity evaporator was not operating during the drill, so all valve manipulations and equipment mode changes were simulated.

c. This was the first time this drill had been run.

d. Use of radios by the drill coordinator and the monitors resulted in good coordination during the drill.

e. A 5-feet diameter area around the failed pump was simulated to be sprayed with an acidic, radioactive solution. A drill monitor taped this area off before the drill started, alerting the two operators to the spill area.

f. The drill guide required a 5-feet diameter spill area. A safety shower was located approximately two feet from the spill area. When one of the operators was simulated to be sprayed with acidic solution, he went to the safety shower and simulated spraying himself down for ten minutes. The drill monitors did not note that the safety shower water would flood the floor, run into the spill area, and dilute/spread the radioactive solution sprayed on the floor. The drill guide listed an expected action of the operator using the nearby safety shower, but did not consider this drill complication. This was discussed with the EUO Drill Coordinator, who agreed this was a problem that needed to be rectified.

g. The Nuclear Criticality Safety Organization (NCSO) was contacted for guidance during the drill. They provided initial guidance, but no follow up guidance. The facility drill coordinator later said he should have briefed NCSO on the degree of participation expected of them.

h. The drill team maintained satisfactory control of the drill. As the pace of the drill slowed, the facility drill coordinator contacted each drill monitor to determine if all drill guide expected actions had been completed by the participants. He used this information to determine when to terminate the drill.

i. The facility drill coordinator allowed the drill to continue past the point where all expected actions were completed to allow radiological control technicians to set up and use boundary control and air monitoring equipment.

j. On at least three occasions, drill participants asked for drill information from monitors that should have been obtained from other participants. In all instances, the monitors correctly said nothing.

k. A high-level alarm drill cue card was placed on the applicable wet trap. It should have been placed on the alarm panel mounted on the wall above and to the right of the trap.

l. The debrief was attended by the drill team and the participants. The drill team members debriefed first, followed by the participants. The participants placed more emphasis on what could be done to improve the drill and their performance, while the drill team members emphasized the positive things they observed.

m. No one discussed the dilution/spreading of the spill liquid by the safety shower water.

n. A problem with radio static between the scene and the shift manager's office was identified.

Overall, the drill was satisfactory, with good drill control. Improvement in the drill scenario and less drill simulation were needed. These deficiencies were discussed with the EUO Drill Coordinator.

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

Another routine operations drill, involving a uranium metal chip fire at a lathe in the M-Wing of Building 9215, was observed. The pre-drill brief and the post-drill debrief were also observed. The following items were noted:

a. The facility drill coordinator (FDC) made drill monitor assignments and read the drill scenario and expected actions of the drill guide during the pre-drill brief. She answered questions about the drill scenario. She did not review the use of Code October or discuss all the drill termination points. She did not review the required actions of Emergency Operating Procedure (EOP) Y55-37-001.

b. The following discrepancies existed between the expected actions of the drill scenario and EOP Y55-37-001:

(1) The first action step of the EOP required the machinist or a co-worker to call 911 or pull the Gamewell box alarm. The scenario expected actions only discussed calling 911 or pulling the Gamewell box after the machinist decided he would not fight the fire and had exited the area.

(2) The EOP approved use of coolant from a clean coolant station for fire fighting. The drill scenario did not discuss this option.

c. At the brief, the FDC said the drill would start when she and the other drill monitors entered M-Wing. Twenty minutes passed after they entered M-Wing before the drill started, due to the late arrival of the supervisor and machinists in the area. Good drill practice would require these people to be in their work area before the drill team arrived.

d. The following scene drill scenario deficiencies were noted:

(1) The lathe was not operating, which precluded observing whether the machinist would shut down the lathe in the event of a fire.

(2) The machine coolant system was not operating, which precluded observing whether the machinist would increase coolant flow. The machinist did grab the hand held coolant supply squirter hose and simulated using it; however, the squirter had a manual trigger-locking device, which was not disengaged. Actual use of the squirter would demonstrate whether he would have disengaged the locking device.

e. The machinist, who was simulated to be operating the lathe where the chip fire drill occurred, initially told a co-worker to pull the Gamewell box because of the simulated chip fire. Before

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

the co-worker could pull the Gamewell box, the machinist at the fire yelled that the fire was under control, so the co-worker did not pull the Gamewell box.

f. Once the fire was out, the supervisor arrived at the scene, after making his required report to his shift manager, and directed a 15 feet safety boundary be set up around the fire area until RADCON and criticality safety personnel had decided a course of action. He also reviewed EOP Y55-37-001 to ensure the appropriate response actions had been taken by everyone.

g. In the Building 9215 Shift Manager's office, the shift manager received notification of the chip fire. He was informed no one was injured and the fire was under control. The shift manager utilized excellent communication skills, such as repeat backs, during this communication.

h. After the initial report and announcement, the shift manager searched for the procedure for a chip fire. He pulled out the *Abnormal Operating Procedure (AOP) Manual* and said the applicable AOP had been canceled last Friday. He also checked another manual outside his office, but could not locate the procedure and said no active procedure existed.

i. Wasting no more time looking for the procedure, the shift manager correctly simulated notifying PSS, RADCON, the Nuclear Criticality Support Organization, and the DOE facility representative.

j. After the drill was terminated, the shift manager found the procedure, now labeled an EOP instead of an AOP, in a division-level procedure notebook. The AOP cancellation notice canceled the AOP, but did not indicate it was being replaced by an EOP. A review of Procedure Y10-102, *Technical Procedure Process Control*, revealed no guidance was given on how to replace one procedure with another. No EUO procedures addressed this problem.

k. After the drill, the potential use of fire-fighting coolant obtained from clean coolant stations was discussed with the supervisor. He said four liter beakers were used to obtain the coolant. When asked, he said no four liter beakers were available in the M-Wing shop because use issues had not been resolved.

l. At the post-drill debrief, the following items were noted:

   (1) The machinist at the scene said there was no reason to call 911 or pull the Gamewell box if the chip fire could be brought under control quickly. The supervisor and other machinists agreed. The post drill criteria writeup identified that the EDP needed to be changed to allow this action to be optional.

(2) The person conducting the post-drill debrief started by asking for the participant's evaluation of the drill, but then did not receive input from all participants before getting the monitors' evaluation.

m. The following discrepancy existed with the drill guide:

The drill guide scenario specified that the machinist will contact his supervisor "after the chip fire has been suppressed." but the drill guide specified that he "leave [the] area and move a safe distance from the fire." The supervisor could not move away from the fire if he was not notified until it had been suppressed.

n. EOP Y55-37-001 had the following discrepancies:

(1) Step 2[1] required the first response action to be calling 911 or pulling the Gamewell box. The Gamewell box was located approximately 100 feet from the machine where the fire occurred. According to the machinists, taking time to call 911 or pull the Gamewell box would result in the chip fire being out of control when they returned.

(2) Step 3[1] was assigned to the supervisor. He was required to notify several persons, including himself.

o. Training records for Y55-37-001 were reviewed. Involved machinists, the supervisor, and the shift manager attended the training that was held on March 25, 1998, and April 1, 1998. Training consisted of a line-by-line review of the procedure. According to the instructor who conducted the training, no questions or objections were raised by attendees about procedure content.

Overall the drill was adequate. Improvements in using less drill simulation and less confusion in required emergency actions were needed. These drill deficiencies were discussed with the EUO Drill Coordinator.

Eight of 24 EUO Drill Guides were reviewed. The following items were noted:

a. Seven were credible accident scenarios for high risk processes.

b. None required equipment to actually be operated during a drill. The EUO drill coordinator said he had made the decision to simulate running equipment during drills. It was discussed with the EUO Drill Coordinator the need to actually operate equipment for drills when it was safe to do so.

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

c. Although there was a "Safety" section in each drill guide, no specific safety assignments were made to any drill monitors. A drill safety observer, as described in Section 4.6 of the *Y-12 Nuclear Operations Conduct of Training Manual*, was not discussed in any of the drill guides. These deficiencies were discussed with the EUO Drill Coordinator.

Thirteen completed drill packages were reviewed. The following items were noted:

a. Nine were credible accident scenarios for high risk processes.

b. Six had debrief comments that the expected actions of the drill guides did not match the required actions of the applicable Abnormal Operating Procedure (AOP) or Emergency Operating Procedure (EOP). The EUO drill coordinator said this occurred because the drill scenarios were written before the applicable AOP or EOP was issued.

c. All were graded as satisfactory.

d. None had the date submitted, date validated, or the validation signature blanks filled in on the "Drill Lesson Learned" form, as required by the EUO Drill Plan.

e. Five did not have the "YES" or "NO" blank checked on the "Drill Lessons Learned" form to indicate whether the lessons learned should be reviewed periodically.

f. All personnel assigned as drill monitors had been trained on Module 13211 (Drill Monitor) and were on a list of trained drill monitors approved by the operation managers for Buildings 9212 and 9215.

g. Five of 12 training manager signature blanks on the "Drill Lessons Learned" form that indicated corrective action was complete were not filled in. The remainder were marked "N/A."

The information used to determine the scenarios needed for credible accidents for high risk processes was based on safety analysis documents that had been superseded. The EUO drill coordinator said he did not know they had been superseded. He immediately obtained the correct documents and said he would update his scenario information.

There were no criticality drill scenarios.

ORR ASSESSMENT FORM

Functional Area: DRILLS (DR)	Core Objective Number: (CO-22)	Date: April 14, 1998

Conclusion:

The EUO routine operations drill program is at a basic level that meets the requirements of this core objective.

Inspected by: F. E. Freeman	Approved by: ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-23)	Date: April 14, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Management qualifications are defined.

2. EUO management personnel and subcontractors who supplement EUO management personnel meet the defined management qualifications.

Personnel contacted/position:

EUO Training Department Manager
Chemical Process and Recovery Trainer
Training Team Leader for Metal Production
Training Team Leader for Management & Technical Staff Training

Records & other documents reviewed:

Y/MA-7316, *ORR POA for EUO Restart Phase A1*
Y/MA-7322, *9212 and 9215 Chemical and Metal Processing Minimum Staffing and Production Staffing Requirements*
Y/MA-7278, *EUO PBR Qualification Areas and Process Assignments*
Training and Qualification Program Descriptions
Initial Training Program Descriptions
Engineering and Technical Staff Qualification Requirements Data Forms
TMS Requirements/Qualification Status Reports

Evolutions/operations witnessed:

None

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-23)	Date: April 14, 1998

Discussion:

TQPDs for shift managers and production managers were reviewed. The training and qualification requirements for other managers in the operating organization were identified on Engineering and Technical Staff Qualification Requirements Data Forms. These forms included education, experience, and special requirements for each manager position. The requirements listed on the form for a particular position were approved by a manager at least one level above the position specified on the form. This form was intended to be an interim step for prestart, with TQPDs being developed for these positions by December 1999. [The EUO training manager was submitting a revision to the TIM to remove the following managers from the list of managers in the TIM: configuration management, work control, maintenance, programs, and procedures.]

The education and experience requirements specified on these forms were consistent with those required by DOE Order 5480.20A. The special requirements included the Building 9212/9215 OSR/BIO review and other site specific training requirements. Other applicable DOE Order 5480.20A training requirements were to be evaluated and added to the TQPDs in the future, according to the technical lead for management and technical staff training. Most of these managers maintained currency at the facilities by performance of their day-to-day responsibilities (e.g., approving BIO/OSR changes, procedure changes, modification changes, etc.).

A review of the TMS Requirements/Qualification Status Reports and rosters attached to the Engineering and Technical Staff Qualification Requirements Data Forms indicated that the specified training had been completed. This had been verified prior to the management qualification signatures.

Mentors were subcontractors who supported operations managers. Y/MA-7309, Rev. 2, *EUO Mentor Program*, specified the preferred education and experience requirements for individuals who filled the mentor positions. These were only preferred requirements, so not all mentors would necessarily meet all the requirements specified. However, verification that the individuals met these requirements or that a judgement was made based on other capabilities, experience, and characteristics was not documented. It was stated in Y/MA-7309 that a review of an individual's resume was the basis for selection for an assignment as a mentor.

The EUO deputy manager, who was responsible for the EUO mentoring program, said that a TQPD or similar document did not exist unless EUO training had it. He also said the only facility-specific training mentors received was MAA access and other generic training, even if they had never worked at EUO facilities before. Discussions with the EUO Management and Technical staff training technical lead indicated that neither Engineering and Technical Staff Requirements Data Forms nor TQPDs for individuals who filled the mentor positions were maintained by EUO training.

ORR ASSESSMENT FORM

Functional Area: TRAINING AND QUALIFICATION (TQ)	Core Objective Number: (CO-23)	Date: April 14, 1998

Completion of the required MAA access and other generic training was documented in TMS. A review of TMS printouts indicated that these individuals had completed other training in addition to MAA access training, including appropriate facility-specific training.

Since the training and qualification requirements for mentors were not documented either in a TQPD or similar document, it could not be verified that they were met. (Finding A1-TQ-10)

Conclusion:

Except for mentors, EUO management personnel and contractors who supplement EUO managers had adequate definition of training and qualification requirements. Requirements for mentors were not defined, but do not require resolution before resumption. The criteria for this core objective have been met.

Inspected by: C. K. Stalnaker T. L. Betz	Approved by: [signature] ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-24)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. The EUO organization is clearly documented.
2. The EUO organization is known to division personnel.
3. Interfaces with tenant and support organizations are clearly documented.
4. Responsibilities for key operations positions are clearly documented.
5. Operations management is clearly documented as being responsible for safe operation.

Personnel contacted/position:

Vice President for Restart Operations
EUO Facility Manager
EUO Deputy Facility Manager
Building Warden
Mentors

Records & other documents reviewed:

EUO Organization Manual
Y/MA-7309, *Enriched Uranium Operations (EUO) Mentor Program*
Y/MA-7367, *Enriched Uranium Operations (EUO) Startup Plan*

Evolutions/operations witnessed:

See Core Objectives 7, 9, and 19.

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-24)	Date: April 11, 1998

Discussion:

The EUO organization manual contained numerous organization charts for the various parts of the organization up to the EUO facility manager. Many of the positions on the charts were not filled. However, based on the review of CO-18, minimum staffing requirements were being met for all levels of the organization.

The manual also contained a list of staff assignments, which included primary responsibilities as well as collateral duties. In addition, the manual contained the Job Descriptions for the positions reflected on the organization chart.

The Management Self-Assessment was completed on February 20, 1998, and the report stated: "...as a compensatory measure, qualified mentors will be assigned to all work activities affecting the authorization basis until operators and supervisors demonstrate sufficient conduct of operations understanding and discipline to alleviate the need for mentors" (emphasis added). Y/MA-7309 and Y/MA-7367 were the two documents intended to define when mentors were required and how a determination was made that mentors were no longer required. With the exception of one statement in Y/MA-7367, which required mentors the first time certain procedures were used, there was no definitive statement that required mentors be present at other times. The documents described how one would decide if mentors were needed. However, as the EUO deputy facility manager described it, there was a great deal of "flexibility" allowed in making that decision. (Finding A1-MG-02)

The revised Mentor Program was approved on February 27, 1998. At the beginning of the ORR on March 2, 1998, several mentors said they knew their roles had changed, but they were not sure as to exactly what they were. As the new program was implemented, the mentors said they understood their roles when assigned to a specific activity.

The Mentor Program required that mentor safety oversight coverage be indicated on the Plan-of-the-Day (POD) and on the facility's Work Area Assignment. During the first four days of the ORR, the PODs wee compared to the Mentor Assignment list approved daily by the EUO deputy manager and posted in the shift manager's office. No mentor requirements were listed on the Building 9215 POD. The following problems were noted in Building 9212:

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-24)	Date: April 11, 1998

DAY	POD Requires Mentors, but Assignment Sheet Does Not	Assignment Sheet Requires Mentors, but POD Does Not
1	Casting Ops Coldstart	Non-SNM Door
2	Casting Ops Coldstart	B-1 Lab
3	Wet Vac System DAG Ops Coldstart Pack/Ship Ops	---

Conclusion:

With the exception of the use of mentors, the EUO organization had established duties, responsibilities, authorities, and organizational interfaces as required by the criteria associated with this functional area. After the mentor program establishes clearly when mentors are required to support safe operations and when that support is no longer needed, this core objective will be satisfied to support restart of Phase A1 processes.

Inspected by: R. D. Shaffer	Approved by: [signature] ORR Team Manager Date: 4/14/98

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ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-25)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Formal deficiency identification and handling processes are established.

2. The deficiency identification and handling processes are understood by operations personnel.

3. Health and safety deficiencies are categorized as pre- or post-start.

4. Pre-start deficiencies are corrected or on schedule to be completed before restart.

5. Post-start deficiencies are tracked for closure.

Personnel contacted/position:

Deputy for Transition & Integration
Technical Support Manager
Administrative Support Manager
Vice President Restart Operations
PBR Program Manager
QA Specialists
Fire Protection Engineer
ESAMS Coordinator
Engineering Manager
Restart Program Manager

Records & other documents reviewed:

L. A. Felton to J. P. Flynn memo of March 2, 1998, regarding readiness to proceed with the ORR
L. A. Felton to R. J. Spence memo of December 29, 1997, regarding fire protection program
L. A. Felton to R. J. Spence memo of January 26, 1998, regarding fire protection program

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-25)	Date: April 11, 1998

Evolutions/operations witnessed:

Implementation of corrective actions was verified.

Discussion:

Attachment 4 of the readiness to proceed memo was a "manageable list" of open pre-start items. It contained an Energy Systems Action Management System (ESAMS) report, a punchlist of fire protection items, and a Phase A1 Punchlist. The deputy for transition and integration and the Process Based Restart (PBR) program manager said these items contained a total list of Phase A1 open pre-start issues.

The technical support manager provided a list of 174 items from the Management Independent Assessment (MIA) that had been reclassified from post- to pre-start about two weeks before the beginning of the Operational Readiness Review (ORR). On the second day of the ORR, 131 of these items were still open. When asked, the deputy for transition and integration said these items were contained as a single entry to close MIA findings on the A1 Punchlist. However, the A1 Punchlist provided by the PBR program manager did not contain this action item. The PBR program manager said he intended to track these as one item on the A1 Punchlist, but that item had not yet been added.

According to the administrative support manager, at the end of the first day of the ORR, there were 124 open pre-start ESAMS "issues" (non-fire protection issues). He also said 46 of these were issues that were closed internally and were awaiting DOE concurrence. The Quality Assurance specialist tracking these items provided a list of 47 issues awaiting DOE concurrence. When the 124 issues were reviewed, it was determined that closure required completion of 227 individual corrective actions. Subsequently, the administrative support manager said there were 27 open pre-start items on a deficiency report tracking system that were not being tracked or any other system. There was no single list or person who could specifically identify all actions required to be completed prior to restart. (Finding A1-MG-01)

The evidence files for 15 closed (or canceled) corrective actions were reviewed. All corrective actions had been closed (or canceled) within the previous three months. The actions reviewed and results were as follows (Finding A1-MG-03):

a. Deficiency Report BKS 02.02

   All corrective actions were verified to be completed.

b. Deficiency Report BKS 04.03c

   All corrective actions were verified to be complete.

c. Deficiency Report CE/W 05.01c

All corrective actions were verified to be complete.

d. Deficiency Report CMH 01.01h

All corrective actions were verified to be complete.

e. Deficiency Report DAG 08.02

All corrective actions were verified to be complete.

f. Deficiency Report DV3 04.05

The corrective action for this item was to revise the OSR to delete dimensions for a HEPA filter. The item was closed based upon a change request being submitted. The OSR had not actually been revised.

g. Deficiency Report DVS 01.01

The corrective action was to revise a CSR. The item was closed based on a change request being submitted. The process engineer said the CSR had not been revised.

h. Deficiency Report LAB 05.07

This item was closed because it was a Phase B item. The problem had not been resolved per the process engineers.

i. Deficiency Report LAB 07.04

This item was closed because it was a Phase B item. The problem had not been resolved per the process engineers.

j. Deficiency Report MF 07.02

A test procedure required verification that no voltage was present on a specific terminal. The voltage measured was 4.8V. This was closed because "4.8V is an...essentially zero reading compared to an output signal reading of approximately 120V." No technical justification was provided for 4.8V being acceptable.

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-25)	Date: April 11, 1998

k. ESAM 54201/I35045

The finding stated: "There is an absence of a quality culture in relation to implementation of EUO work processes:

- Discussions with EUO personnel indicate that the EUO QA Plan has not been distributed widely within EUO and few who did get a copy have read it.
- Processes to manage and perform both operations and administration of EUO, as well as the EUO management systems, have been developed and implemented without integration of the QA Plan requirements. These processes and systems can, in most cases, be mapped to the QA Plan requirements, and this would be a useful thing for EUO to do. However, it appears QA Plan requirements are integrated with neither EUO operations nor administration, but are treated separately as beyond or above necessary activity. This exemplified by these observations:
    - The quality activities are fragmented and communicated poorly with anything else
    - There is no EUO ownership of the EUO QA Program
    - Management provides little or no oversight or guidance to the EUO QA Program
    - Few EUO personnel have read the EUO QA Plan document"

This was closed because the QA Plan had been revised. There was no indication that the identified problems were addressed.

l. ESAMS S4171/I 34725

This item was closed based upon a change being proposed to a CSR. The change had not been made at the time of closure.

m. ESAMS S85/I3497

This issue was identified as: "call out of criticality safety approval controls and limits in operating procedures is often less than adequate."

This item was identified in 1990 and canceled in 1998 because: "Since the shutdown in 1994, the criticality safety program has been entirely revamped. In addition, as part of the resumption process, operating procedures are upgraded to assure their adequacy."

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-25)	Date: April 11, 1998

n. ESAMS S4240/I35168

Corrective action was verified to be complete.

o. ESAMS S4241/I35352

This item was to develop a fire barrier program to ensure the integrity of fire barriers, fire doors, fire dampers, etc.

This was closed by issuing a Memorandum of Understanding (MOU) between EUO and Fire Protection Operations. However, one of the items in the MOU stated: "Central Engineering Procedure EP-CC-302, "Excavation/Penetration," will be modified to include the review of fire barriers and appropriate penetration seals" (emphasis added). Procedure EP-CC-302 had not been revised at the time the MOU was issued. A revision to the MOU on March 21, 1998, deleted the requirement to revise Procedure EP-CC-302.

In addition, the MOU required numerous other actions in the future. These actions included such items as determining adequacy of fire barriers, documenting location of fire barriers, and inspecting fire barriers. These actions have either been completed or are on schedule to be completed.

Conclusion:

The deficiency tracking protocol implemented to support restart of Phase A1 processes did not allow for a consolidated listing of all issues associated with restart. Further, closure processes, specifically the evidence packages, did not support correction of issues and verification of implementation. In many cases, issue closure was based or either incomplete actions or actions to be taken in the future. Upon correction of the prestart findings associated with this core objective, the criteria will be met.

Inspected by: J. P. Flynn	Approved by: [signature] ORR Team Manager Date: 4/14/98

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-26 and -27)	Date: April 11, 1998

Method of Appraisal (short narrative description):

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

Criteria:

1. Y-12 programs must implement the applicable standards/requirements identification documents (S/RID) in the following functional areas:

   Management Systems
   Quality Assurance
   Configuration Management
   Training and Qualification
   Emergency Management
   Engineering
   Construction
   Operation
   Maintenance
   Radiation Protection
   Fire Protection
   Packaging and Transportation
   Waste Management
   Facility (Nuclear) Safety
   Occupational Safety and Health
   Environmental Protection

2. Corrective actions are being implemented as approved by DOE in Request for Approval (RFA) LMES/Y-12-ORIG-1300.X1A-CSA-130, *Configuration Management on Standards/Requirements Identification Documents*.

3. Non-compliances have been identified and corrected or included in the RFA.

Personnel contacted/position:

Assessments Manager

ORR ASSESSMENT FORM

Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-26 and -27)	Date: April 11, 1998

Records & other documents reviewed:

Y-12 Enriched Uranium Operations Compliance Assessment Report, July 1997
RFA LMES/Y-12-ORIG 1300.XIA-CSA-130B, *Configuration Management on Standards/Requirements Identification Documents*
RFA LMES/Y-12-DOE-5480.19-CSA-162D, *Conduct of Operations Implementation Deficiencies for Enriched Uranium Operations (EUO) Facilities*

Evolutions/operations witnessed:

See Core Objectives 7, 9, and 19.

Discussion:

The assessments manager indicated that an EUO specific order compliance assessment had been conducted in 1997 and documented in a July 7, 1997, *Y-12 Enriched Uranium Operations Compliance Assessment Report*. Implementation was addressed in the Management Self Assessment conducted as part of the EUO restart process. He described the process for incorporating DOE Orders into EUO command media as follows. DOE Orders were incorporated into Y-12 Standards/Requirements Identification Documents (S/RID). Y-12 S/RIDs were incorporated into Y-12 command media. Y-12 command media requirements were incorporated into EUO command media. He said the EUO S/RIDs were essentially identical to the Y-12 S/RIDs.

A triennial compliance review of all of Y-12 was conducted in 1997.

Review of the July 7, 1997, Y-12 Enriched Uranium Operations Compliance Assessment Report revealed there were 11 noncompliances identified during the review. A review of the identified noncompliances in the Energy System Action Management System showed that all noncompliances had been addressed and closed.

Both Requests For Approvals (CSA-130B and 162D) had been reviewed and approved by the appropriate LMES and DOE personnel.

Since all corrective actions associated with the EUO specific compliance assessment had been closed, the additional interviews mentioned in the CRADs for CO-26 and 27 were not necessary.

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Functional Area: MANAGEMENT (MG)	Core Objective Number: (CO-26 and -27)	Date: April 11, 1998

Conclusion:

These objectives have been met.

Inspected by: J. P. Flynn	Approved by: J P Flynn ORR Team Manager Date: ~~4/14/98~~ JPF 4/14/98

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- Management Self-Assessment Report, memorandum, K. Branum to J. Barker, LMES, January 21, 1998.
- Dosimetry and Records Department Quarterly Assessment Report of MK Ferguson Dosimetry, report number DOS-97-02, June 16, 1997.
- Assessment Checklist, *Implementation of Posting Requirements*. Dates of assessment, 9/11/97 to 9/19/97.
- Radiological Work Permit Implementation Assessment, memorandum, K. Branum to J. Barker, LMES, May 12, 1997.
- LMES Compliance Assessment Reports for 10 CFR 835, examples, dated 4/24/97.
- Protocol between Radiological Control (RADCON) and the 9212 Facility Manager for Transfer of Personnel and Material Between High Contamination Areas via Radiological Buffer Area, PROTOCOL-97-003, Rev. 1, October 14, 1997.
- Protocol between Radiological Control (RADCON) and the 9212 Facility Manager for Removal of Trash and Used (Dirty/Contaminated) Anti-C Laundry from Boundary Control Stations at 9212, PROTOCOL-97-004, Rev. 0, November 24, 1997.
- Air Sampling at the Y-12 Plant, RCT Training Module, delivered April - May, 1998.
- Identified Deficiencies or Poor Task Performance, RCT Training Module, delivered February, 1998.
- Sample RCT Comprehensive Examination.
- Contract DE-AC05-84OR21400, Y-12 Plant As Low As Reasonably Achievable (ALARA) Goals for Radiological Protection Calendar Year 1998, memorandum Gustavson, LMES, to Jackson, DOE/YSO, April 30, 1998.
- Y-12 Price-Anderson Amendments Act (PAAA) Site Evaluation Board (YSEB), memorandum, Gustavson to Butz, et al, LMES, March 31, 1998.
- Y-12 Site Office Assessment of enriched Uranium Operations Phase A1 Activities at the Y-12 Plant, US DOE Oak Ridge Operations, April 30, 1998.
- Lockheed Martin Energy Systems, Inc. Operational Readiness Review Report for the enriched Uranium Operations Restart Phase A1 at the Oak Ridge Y-12 Plant, April 1998.
- Y-12 Site Office (YSO) Radiological Control (RADCON) Protocol for Occurrence Reporting, letter from Jackson, DOE/YSO, to Gustavson, LMES, October 27, 1997.
- Consensus of the Y-12 Plant Radiological Control Organization and the U.S. department of Energy (DOE) Y-12 Site Office regarding Radiological Control Reporting Requirements of DOE M 232.1-1A, "Occurrence Reporting and Processing of Operations Information", September 22. 1997.
- Radiological Work Permit, RCO/Y-FO-400, Rev. 1, 8/29/97.
- Y-12 Occurrence Reports involving radiation protection related incidents at EUO facilities during CY98.
- First Quarter Summary of Off-Normal Personnel Contamination Occurrences, memorandum from Barker to Beck, Bowers, et al, LMES, April 13, 1998.

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- Example graphs and data from the Y-12 off-normal and non-reportable radiological incidents tracking and trending process, April 1998.

Interviews Conducted:

- Y-12 RADCON Manager
- DOE YSO RADCON Manager
- Y-12 Field Operations Manager (RCO)
- A DOE YSO Facility Representative for EUO
- 9215 Radiological Engineer
- 9212 Radiological Engineer
- 9215 RADCON Supervisor
- 9212 RADCON Supervisor
- Y-12 Technical Programs Manager (RCO)
- Y-12 Dosimetry and Records Manager
- Y-12 RADCON Field Instrumentation Supervisor
- Y-12 ORPS Program Manager
- EUO RADCON Technicians (6)
- RADCON Training Team Leader
- RADCON Policy/Regulation Lead
- Team Leader, RADCON Compliance and Assessment Group

Shift Performance Evolution:

- RADCON "Management by walking around" assessment of 9212
- Code 80 Glovebox operation pre-job briefing
- Code 80 Glovebox operation
- Crucible cleanup from casting operation
- Routine RCT performance during operations

Discussion of Results:

Records Review: Reviews of the documentation concerning the organizational structure demonstrate that the radiation protection program is established sufficiently to support EUO operations. Organization charts, functions, roles and responsibilities, and reporting relationships are defined and implemented. Minimum qualification levels are established for the technical staff. Training requirements are established for those non-professional and supervisory positions which have training requirements placed upon them.

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Documentation of LMES and YSO assessments indicate that the program has achieved a satisfactory level of compliance with the requirements placed upon it. Internal audit and assessment processes are in place to identify, report, and respond to potential deficiencies. A process is in place for the review and appropriate reporting of Price-Anderson Amendments Act (PAAA) related deficiencies should they occur.

Recent occurrence reports were reviewed and determined to contain a sufficient level of detail, causal analyses, and appropriate corrective actions. Incidents that occurred but were not above the reporting thresholds were also internally tracked and trended, with corrective actions taken when the underlying causal factors were identified.

A review of several RADCON operating procedures demonstrated a level of detail, appropriateness, and completeness sufficient to support operations. One procedure in particular, *Radiological Work Permit*, RCO/Y-FO-400, Rev. 1, 8/29/97, is noteworthy in the amount of supplemental information and methodology provided to assist the user in developing effective RWPs.

Site-wide ALARA goals are established, reviewed, and updated by Y-12 management on an annual basis, and are applicable to EUO operations.

Interviews: All interviews with the radiation protection staff indicated that they were familiar with the roles and responsibilities. Personnel in direct support of the EUO operations organization were cognizant of and comfortable with their assignments and interfaces with EUO. Interviews with personnel in indirect roles indicated that they were cognizant of the impact of their functions upon the EUO restart activities. The working relationship between the RADCON organization, the occurrence investigation and reporting organization, the DOE Site Office (YSO) and the EUO operations organization is noteworthy in it's efficiency and effectiveness in identifying, analyzing, reporting, and responding to occurrences.

Shift Performance: Observations of radiation protection staff during operations and maintenance evolutions demonstrated an adequate level of attention to health, safety, and environmental protection issues. Interfaces with the operations organization were appropriate and effective in the evolutions observed.

General housekeeping within the areas visited was good. The recent and ongoing efforts to reduce the levels of contamination and the size of the contaminated areas were observed to be successful in reducing both the hazards to the workers and the associated costs, and should be encouraged to continue.

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Conclusion: The criteria for this objective have been met. Due to the nature of the support they provide EUO, the radiation protection organization has been in operations throughout the shutdown of the facilities. Also, changes of a few years ago in the LMES RADCON Manager position and the YSO RADCON Manager position, have resulted in strong leadership and direction in the protection programs site wide, as is evidenced from the completeness of the programmatic documentation and it's implementation.

Issue(s):

- The procedure, *Radiological Work Permit*, RCO/Y-FO-400, Rev. 1, 8/29/97, is noteworthy in the amount of supplemental information and methodologies provided to assist the user in developing effective RWPs. (RP1-1)

- The working relationship between the RADCON organization, the occurrence investigation and reporting organization, YSO, and the EUO operations organization is noteworthy in it's efficiency and effectiveness in identifying, analyzing, reporting, and responding to occurrences. (RP1-2)

Inspector: Douglas M. Minnema Douglas M. Minnema	Team Leader: Jeffry L. Roberson Jeffry L. Roberson

ORR DEFICIENCY FORM
Radiation Protection

Functional Area: RP	Objective No.: 1	Finding Observ. X	Pre-Start Post Start	Issue No.: RP1-1 Rev.: 0 Date: May 12, 1998

ISSUE: The procedure, *Radiological Work Permit*, RCO/Y-FO-400, Rev. 1, 8/29/97, is noteworthy in the amount of supplemental information and methodologies provided to assist the user in developing effective RWPs.

REQUIREMENT: "Authorizations shall be required to perform specific work within the area and shall include specific radiation protection measures."

REFERENCE(S): *Occupational Radiation Protection*, 10 CFR 835.501(d)

DISCUSSION: The Radiological Work Permit (RWP) is a key component of operational radiological control. It informs the radiological worker of the nature and degree of radiological hazard that could be encountered during the performance of a task, and establishes the protective measures to be taken before, during, and after the performance of the work. Therefore, the development of the RWP requires the author to consider the currently known conditions of the workplace (and obtain additional information as necessary), the potential for encountering radiological hazards, and the various radiation protection measures that must be balanced to provide optimized protection to the worker and during the performance of the task. The procedure also instructs the author to interface with other safety disciplines for input to provide an integrated approach to safety.

The identified procedure is noteworthy due to the completeness of it's discussion of this development process and the inclusion of various appendices that provide supplemental information and methodologies for the author to use during writing of the RWP. As an example, the appendices include sections on radiological hold point guidelines, engineered controls, external and internal exposure monitoring guidelines, respiratory protection, and surveillance requirements for job-specific RWPs.

Inspector: Douglas M. Minnema Douglas M. Minnema	Team Leader: Jeffry L. Roberson Jeffry L. Roberson

ORR DEFICIENCY FORM
Radiation Protection

Functional Area: RP	Objective No.: 1	Finding Observ. X	Pre-Start Post Start	Issue No.: RP1-2 Rev.: 0 Date: May 12, 1998

ISSUE: The working relationship between the RADCON organization, the occurrence investigation and reporting organization, YSO, and the EUO operations organization is noteworthy in it's efficiency and effectiveness in identifying, analyzing, reporting, and responding to occurrences.

REQUIREMENT: "Monitoring of individuals and areas shall be performed to: ...(3) detect changes in radiological conditions; (4) detect the gradual build-up of radioactive material in the workplace; and (5) verify the effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure."

REFERENCE(S): Occupational Radiation Protection, 10 CFR 835.401(a)

DISCUSSION: An important component of a good radiation protection program is the process by which it evaluates the effectiveness of it's practices, and the practices of the personnel that it is intended to protect. The DOE Occurrence Reporting and Processing System (ORPS) can provide a significant role in that evaluation, depending upon it's implementation at a site or facility. There is a strong positive working relationship between the RADCON organization, the occurrence investigation and reporting organization, YSO, and the EUO operations organization. Radiological incidents that met the thresholds for ORPS reporting were aggressively investigated, documented, evaluated, and reported. Corrective actions appeared to be appropriate, adequate, and implemented in a timely manner. Monthly meetings are held and attended by all four organizations to discuss the current status of all open ORPS reports and their corrective actions.

It is noted that often, especially for some types of contamination incidents, the implementation of corrective actions based upon individual occurrences is neither appropriate nor cost-effective. These groups have taken advantage of the ability to establish 'roll-up' reports to allow them to reduce the costs of reporting while looking for common mode failures where corrective actions may be more effectively identified and applied.

Finally, these organizations also collect information regarding radiological incidents that occur but do not exceed the thresholds for ORPS reporting. This information is tracked and trended internally, and corrective actions are taken as appropriate. The status of this effort is also discussed in the monthly meetings.

Inspector: Douglas M. Minnema Douglas M. Minnema	Team Leader: Jeffry L. Roberson Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Radiation Protection

FUNCTIONAL AREA: RP	OBJECTIVE 2, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: Level of knowledge of operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of operations support personnel. **(CORE REQUIREMENT #3)**

Criteria
Radiological protection support personnel demonstrate the ability to carry out normal, abnormal, and emergency procedures under their cognizance. (5480.20A, Ch. I; S/RID FA Radiological Protection (RP) LMES ID # 10067)

Radiological controls support personnel demonstrate a working knowledge of facility systems and components related to safety. These personnel also give adequate attention to health, safety and environmental protection issues and are familiar with the radiological hazards present at the facility. (10 CFR 835; 10 CFR 830.120; 5480.20A, Ch. I; 5700.6C, Criteria II; S/RID FA Radiological Protection (RP) LMES ID # 10067)

Radiological protection support personnel are knowledgeable of radiological requirements and principles, and local radiological control policy and procedures. (10 CFR 835; S/RID FA Radiological Protection (RP) LMES ID # 10067)

Approach
Record Review: Review the Radiological Support personnel training records to verify training in radiological procedures, systems and facility, and system and hazards.

Interviews: Interview radiological protection support personnel to assess their understanding of actions when responding to abnormal and emergency radiological conditions and facility hazards and their understanding of how these actions relate to the safety basis for operations. Determine if these personnel have an adequate knowledge of health, safety, environmental and radiation protection procedures, principles, and issues.

Shift Performance: Observe drills, routine operations and maintenance evolutions, to assess the ability of radiological controls support personnel to safely operate systems and components under their cognizance in accordance with approved plant procedures.

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Radiation Protection

Record Review:

- Radiological Control Organization Roles and Responsibilities, RCO-AD-202PD, Rev. 0, 10/1/97.
- Y-12 Field Operations Radiological Control Technician Training and Qualification Program, RCO-TR-TQ1, Rev. 1, January 30, 1998.
- Training Management System Requirement/Qualification Status reports for 4 Radiological Control Technicians, dated 5/7/98.
- Air Sampling at the Y-12 Plant, RCT Training Module, delivered April - May, 1998.
- Identified Deficiencies or Poor Task Performance, RCT Training Module, delivered February, 1998.
- Sample RCT Comprehensive Examination.

Interviews Conducted:

- Y-12 RADCON Manager
- DOE YSO RADCON Manager
- Y-12 Field Operations Manager (RCO)
- 9215 Radiological Engineer
- 9212 Radiological Engineer
- 9215 RADCON Supervisor
- 9212 RADCON Supervisor
- Y-12 RADCON Field Instrumentation Supervisor
- EUO RADCON Technicians (6)
- RADCON Training Team Leader

Shift Performance Evolution:

- Code 80 Glovebox operation pre-job briefing
- Code 80 Glovebox operation
- Crucible cleanup from casting operation
- Routine RCT performance during operations

Discussion of Results:

Record Review: The RCT training records were reviewed. All RCTs are currently qualified in accordance with LMES requirements. The training material adequately covers the technical knowledge expected by the RADCON management. It is commensurate with the hazards anticipated to be encountered during EUO operations. There was no formal training material in the area of facility and process specific technical information related to phase A1 safety systems and processes. (RP2-1) RCT Supervisors have also completed the RCT training, and are provided additional training as appropriate for their duties.

Interviews: All RCTs interviewed demonstrated a working level knowledge of radiation protection principles and practices necessary to support EUO operations. During the interviews it was noted that there was an informal mentoring process occurring where the RCTs experienced at a facility would work with the newer staff to help them gain the facility and process specific information necessary to perform their duties.

Interviews with the supervisory staff and the LMES RADCON Manager demonstrated their awareness and commitment to the training process. These staff members all regularly contribute to the training process by developing and delivering individual continuing training modules on areas of particular interest to the RCTs, or in recognition of identified weaknesses or concerns. All staff participate in a required reading program where lessons learned from incidents at other facilities and sites are disseminated and discussed for their applicability to radiation protection at Y-12. Interviews with RADCON professional technical staff also indicated their commitment to the training process, and their involvement in training and mentoring the RCTs.

Shift Performance: The RCT staff was observed during routine operations and maintenance evolutions and demonstrated a level of knowledge and competence sufficient to support EUO operations. Since there has been continuing radiological work and maintenance during the shutdown of EUO, the RCT staff has had ample opportunity to gain the experience and confidence necessary to operate effectively when restart occurs.

<u>Conclusion:</u> The criteria for this objective have been met. With the exception of facility and process specific training, the RCT training program is complete and sufficient to support EUO operations. The informal mentoring process between the facility-experienced RCTs and the newer staff has acted as a compensatory measure in this situation. However, of the roughly 18 RCTs who support EUO, only about 5 were present while EUO was last in operation. Therefore, while the mentoring process has apparently worked to develop the RCT staff to a point of being able to support the current EUO restart, a formal program of facility and process specific training should be established and incorporated into the RCT training program.

<u>Issue(s):</u>

- RCT training does not incorporate sufficient facility and process specific technical information as it relates to safe operations. (RP2-1)

Inspector: *Douglas M. Minnema* Douglas M. Minnema	Team Leader: *Jeffry L. Roberson* Jeffry L. Roberson

ORR DEFICIENCY FORM
Radiation Protection

Functional Area: RP	**Objective No.:** 2	**Finding** X **Observ.**	**Pre-Start** **Post Start**X	**Issue No.: RP2-1** **Rev.:** 0 **Date:** May 12, 1998

ISSUE: RCT Training does not incorporate sufficient facility and process specific technical information as it relates to safe operations.

REQUIREMENT: "Training and retraining programs for radiological control technicians shall be established and conducted at intervals not to exceed 2 years to familiarize technicians with the fundamentals of radiation protection and the proper procedures for maintaining exposures ALARA. ... The training program shall include procedures specific to the site or facility where the technician is assigned. The level of training shall be commensurate with the technician's assignment."

REFERENCE(S): Occupational Radiation Protection - Final Rule, 10 CFR 835, December 14, 1993.

DISCUSSION: The Implementation Guide on Radiation Safety Training that accompanies the rule states that "In training RCTs, the depth of knowledge required for adequate job performance is such that much of the training program may be site-specific. This applies particularly to Phase I [academic] training in plant systems, ..." (G-10 CFR 835/J1)

A review of the RCT training program indicates that currently the only formal training RCTs received with specific regards to the EUO operations considered in this ORR is EUO MAA Access Indoctrination. Facility specific information and requirements that relate to safe operations, such as Operational Safety Requirements (OSRs), engineered systems such as ventilation systems, and process specific descriptions are not formally incorporated into the RCT training program in support of EUO operations. This information is important to the RCT in establishing a level of knowledge necessary to perform radiation protection functions adequately in the facility. This training does not have to provide the same degree of proficiency as that of a qualified operator, but it should be sufficient to provide the RCT with an understanding of the facility features and operations that establish the radiological safety envelope for the facility.

CONCLUSION: There is no formal process, and no defined expectations appear to have been established for facility and process specific training of the RCTs. Due to consideration of the informal mentoring between RCTs, and it's observed positive impact on the knowledge of those RCTs interviewed and observed, this finding is considered to be a poststart rather than prestart finding.

Inspector: Douglas M. Minnema Douglas M. Minnema	Team Leader: Jeffry L. Roberson Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Radiation Protection

FUNCTIONAL AREA: RP	OBJECTIVE 3, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: The status of compliance with 10 CFR 835 and associated S/RIDs are adequate for operations. Non-compliances have been addressed. **(CORE REQUIREMENT #7)**

Criteria
All non-compliance issues are adequately addressed in the RPPs or by DOE approved compliance schedule approvals (CSA) or exemptions. The CSAs include an adequate technical basis and schedule for attaining compliance. (Plan for Continuing and Resuming Operations, Y/AD-623, dated October 1994. Y/AD-623, Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction)

Compensatory measures that are specified in the CSAs are adequately implemented. (Plan for Continuing and Resuming Operations, Y/AD-623, dated October 1994. Y/AD-623, Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction)

The implementation of Radiological Controls Rule 10 CFR 835 is on schedule. The implementation of S/RID FA 11 is on schedule.

Approach
Record Review: Review order compliance packages for S/RIDs associated with radiological protection, including all applicable CSAs, exemptions and compensatory measures.

Review status of actions under the Implementation Plan for the Radiological Controls Final Rule. Verify that the Rule has been implemented and that there is a verification program in place.

Interviews: If these Standards/Requirements are not fully implemented, interview management personnel to ensure they are aware of the non-compliance(s) and action necessary to fully implement the order requirements, as well as any interim compensatory measures.

Shift Performance: Where appropriate, observe the implementation of any specified compensatory measures within the facility to determine their effectiveness.

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Record Review:

- Martin Marietta Energy Systems, Inc. Radiation Protection Program Implementation Plan for 10 CFR 835, Occupational Radiation Protection, April 4, 1995.
- Y-12 Plant Compliance Assessment and Implementation Strategy for Title 10, Code of Federal Regulations Part 835, Occupational Radiation Protection, December 22, 1997.
- *Radiological Control Assessment Program*, RCO-AD-400, Rev. 0, 6/14/97.
- Entry Control Assessment Report, Memorandum, K. Branum to J. Barker, LMES, September 22, 1997.
- Onsite Assessment Report of LMES External Personnel Dosimetry Program for DOE Laboratory Accreditation Program (DOELAP), November 3-4, 1997, 11/4/97.
- Management Self-Assessment Report, memorandum, K. Branum to J. Barker, LMES, January 21, 1998.
- Dosimetry and Records Department Quarterly Assessment Report of MK Ferguson Dosimetry, report number DOS-97-02, June 16, 1997.
- Assessment Checklist, *Implementation of Posting Requirements*. Dates of assessment, 9/11/97 to 9/19/97.
- Radiological Work Permit Implementation Assessment, memorandum, K. Branum to J. Barker, LMES, May 12, 1997.
- LMES Compliance Assessment Reports for 10 CFR 835, dated 4/24/97.
- Y-12 Price-Anderson Amendments Act (PAAA) Site Evaluation Board (YSEB), memorandum, Gustavson to Butz, et al, LMES, March 31, 1998.
- Y-12 Site Office Assessment of enriched Uranium Operations Phase A1 Activities at the Y-12 Plant, US DOE Oak Ridge Operations, April 30, 1998.
- Lockheed Martin Energy Systems, Inc. Operational Readiness Review Report for the enriched Uranium Operations Restart Phase A1 at the Oak Ridge Y-12 Plant, April 1998.
- First Quarter Summary of Off-Normal Personnel Contamination Occurrences, memorandum from Barker to Beck, Bowers, et al, LMES, April 13, 1998.
- Examples graphs and data from the Y-12 off-normal and non-reportable radiological incidents tracking and trending process, April 1998.

Interviews Conducted:

- Y-12 RADCON Manager
- DOE YSO RADCON Manager
- Y-12 Field Operations Manager (RCO)
- Y-12 Dosimetry and Records Manager
- RADCON Policy/Regulation Lead
- Team Leader, RADCON Compliance and Assessment Group

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Shift Performance Evolution:

- RADCON "Management by walking around" assessment of 9212

Discussion of Results:

Record Review: A review of the programmatic, procedural, and roles and responsibilities documents demonstrate that there is an adequate program in place to determine and monitor the status of compliance of Y-12 (both LMES and subcontractors such as M.K.Ferguson) against 10 CFR 835 and the associated S/RIDs. This program includes the review of identified non-compliances for Price-Anderson Amendments Act reportability, and the incorporation of corrective actions into the appropriate tracking systems. Documents generated by the assessment process indicate a level of compliance adequate for EUO operations.

The Y-12 RADCON program has fully implemented the provisions of 10 CFR 835 with the exception of one approved exemption dealing with Personal Nuclear Accident Dosimetry. The program is also in compliance with the associated S/RIDs. Consequently, no compensatory measures were in place or required during this review.

Interviews: All personnel interviewed were knowledgeable of their roles and responsibilities with regards to the assessment program. Participants in the program (staff and managers) showed an active interest and involvement in the assessment process.

Shift Performance: The activity observed in association with this objective was a walkthrough of two wings of 9212 as part of the RADCON Manager's routine "Management by Walking Around" self-assessment process. The LMES RADCON Manager, a YSO RADCON representative, the facility RADCON supervisor, and the facility RADCON engineer conducted the walkthrough. Normally, the DOE YSO RADCON Manager and appropriate Facility Representative and facility RCTs would also accompany the group. Results of the assessment are documented, and corrective actions are generated and assigned as appropriate, and tracked through to closure. The level of reporting and tracking is determined based upon the degree of concern associated with the issue.

This activity demonstrated an appropriate level of attention and concern for the status of compliance in the facility.

Conclusion: The criteria for this objective have been met. The compliance assessment and audit process demonstrated an adequate level of compliance with 10 CFR 835 and the associated S/RIDs to support operations at EUO. A systematic process by which compliance is continually assessed and maintained was demonstrated to be in place and adequate.

ORR ASSESSMENT FORM 1
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Issue(s):

- None.

Inspector: *Douglas M. Minnema* Douglas M. Minnema	Team Leader: *Jeffry L. Roberson* Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Safety Envelope Verification

FUNCTIONAL AREA: SE	OBJECTIVE 1, Rev. DATE: May 13, 1998	CRITERIA MET	
		YES	NO X

OBJECTIVE: Facility safety documentation is in place that describes the "safety envelope" of the facility. The safety documentation should characterize the hazards/risks associated with the facility and should identify mitigating measures (systems, procedures, administrative controls, etc.) that protect workers and the public from those hazards/risks. (**CORE REQUIREMENT #4**)

Criteria
The safety documentation addresses appropriate hazards/risks associated with operations necessary to protect the public, workers, and the environment from the safety and health hazards posed by the facility. (5480.23, para 8; S/RID FA Safety Analysis (SA) LMES ID #10561 and #10562)

The BIOs and OSRs have been prepared by the contractor and approved by the DOE. (5480.23, para 8; S/RID FA Safety Analysis (SA) LMES ID #6883, #10580, #10582, #10589)

Approach
Record Review: Review the EUO Phase A BIO, OSRs, CSRs, Safety Evaluation Report (SER), and other safety basis documentation to assess whether the safety basis adequately includes appropriate hazards/risks associated with EUO Phase A operations.

Interviews: None.

Shift Performance: None.

Record Review:

- Y/MA-7254, The Basis for Interim Operation for Building 9212 Enriched Uranium Operation Complex (U), Rev 3, April 1998
- Y/MA-7255, The Operational Safety Requirements for Building 9212 Enriched Uranium Operation Complex (U), Rev 4, April 1998
- YSO-SER-013, R1, Safety Evaluation Report (SER) for Revision 1 of the Basis for Interim Operation (BIO) for Building 9212 Enriched Uranium Operations (EUO) Complex, Y/MA-7254, August 27, 1997
- YSO-SER-060, Safety Evaluation Report (SER) of the Proposed Revision 2 of the Basis for Interim Operations Complex, Y/MA-7254, March 25, 1998

- YSO-SER-035, Safety Evaluation Report (SER) for the Operational Safety Requirements (OSR) for Building 9212 Enriched Uranium Operations (EUO) Complex, Y/MA-7255, August 27, 1997
- YSO-SER-044, Safety Evaluation Report (SER) for the Operational Safety Requirements (OSR) for Building 9212 Enriched Uranium Operations (EUO) Complex, Y/MA-7255, December 3, 1997
- YSO-SER-051, Safety Evaluation Report (SER) for the Operational Safety Requirements (OSR) for Building 9212 Enriched Uranium Operations (EUO) Complex, Y/MA-7255, January 15, 1998
- YSO-SER-070, Safety Evaluation Report (SER) of the Proposed Revision 4 of the Operational Safety Requirements (OSR) for Building 9212 Enriched Uranium Operations Complex, Y/MA-7255, May 2, 1998
- Y/MA-7290, The Basis for Interim Operation for the 9215 Complex Enriched Uranium Operations, Rev 1, March 1998
- Y/MA-7291, The Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, Rev 2 (Corrected), March 1998
- YSO-SER-062, Safety Evaluation Report (SER) of the Proposed Revision 1 of The Basis for Interim Operations for the 9215 Complex Enriched Uranium Operations, Y/MA-7290, March 16, 1998
- YSO-SER-042, Rev 1, Safety Evaluation Report for The Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, Y/MA-7291, November 3, 1997
- YSO-SER-053, Safety Evaluation Report (SER) for the Proposed Revision of the Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, Y/MA-7291, January 22, 1998
- YSO-SER-063, Safety Evaluation Report (SER) of the Proposed Revision 2 of the Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, Y/MA-7291, March 20, 1998
- L. A. Felton to J. Dale Jackson, Contract DE-AC05-84OR21400, Response to HEPA Proposal (980083), dated March 13, 1998
- L. A. Felton to J. Dale Jackson, Contract DE-AC05-84OR21400, Proposed Revision to the Authorization Basis Documents for Enriched Uranium Operations in the 9215 Complex, dated April 24, 1998
- L. A. Felton to J. Dale Jackson, Contract DE-AC05-84OR21400, Proposed Revisions to the Authorization Basis Documents for Enriched Uranium Operations in the 9215 Complex, dated May 4, 1998
- Y/MA-7292, Preliminary Hazard Analysis for the 9215 Complex Enriched Uranium Operations, August 1997
- Y/TS-1403, Fire Hazard Analysis for Building 9215, November 27, 1995
- Y-12-FPE-FHA-001-97, Fire Hazard Analysis for Building 9212 (Including 9423, 9723-

25, 9980, 9981, and 9996), September 5, 1997
- Discussion of Available Consequence Analysis for Natural Phenomena Events Buildings 9212 and 9215, May 1998
- Y50-37-65-101, Uranium Chip Cleaning, Rev 0.2, 3/31/98
- Y50-37-65-104, Enriched Uranium Chip Drying and Briquetting, 4/24/98
- JPA-EW-DVS-0001, E-Wing Dry Vacuum - Vacuuming Dry Material, Rev 0, 1/13/98
- Y50-37-65-530, Movement of Material between Furnaces and Furnace Lines, Rev 0.0, 4/17/98

Interviews Conducted:

- EUO Authorization Basis Manager
- Facility Safety Engineers

Shift Performance Evolution:

- None

Discussion of Results:

Record Review: The safety basis documentation for Building 9212, including the Basis for Interim Operation (BIO), the Operational Safety Requirements (OSRs), and the Safety Evaluation Reports (SERs), was reviewed. The safety basis documentation has gone through several iterations since it was first approved in 1997. The 9212 BIO is on revision 2 and the OSRs are currently at revision 4. Each of the revisions has been reviewed and approved by DOE YSO after the completion of an SER.

During each of the reviews, DOE has raised issues to be addressed by the contractor, including the following:

- Perform further evaluation on the aramid filter and dynal bags to ensure non-combustibility.
- Implement the Unreviewed Safety Question Determination process to resolve the recently discovered potential for an unanalyzed condition concerning the loading line.
- Put procedures in place to define the actions to be taken if the operator required for minimum staffing cannot perform his function.

While the concerns that were identified during the early revisions to the BIO and OSRs have been addressed, the concerns that have been raised in the most recent SERs remain open.

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The safety basis documentation for Building 9215, including the BIO, OSRs, and SERs was reviewed. The safety basis documentation has gone through several iterations since it was first approved in 1997. The 9215 BIO is on revision 1 and the OSRs are currently at revision 2. Each of the revisions has been reviewed and approved by DOE YSO after the completion of an SER.

During each of the reviews, DOE has raised issues to be addressed by the contractor, including the following:

- Continue aggressively to resolve the positive pressure configuration in M Wing.
- Improve the hood survey program and subsequently incorporate it into the safety basis.
- Determine and evaluate the exhaust pathways for all the process machines that do not have hoods in M Wing to ensure that the control identified as necessary to mitigate the accident of concern is truly protected.

While the concerns that were identified during the early revisions to the BIO and OSRs have been addressed, the concerns that have been raised in the most recent SERs remain open. YSO has concluded in the most recent SER for revision 2 to the 9215 BIO that operation of M Wing with positive pressure is an acceptable risk for a temporary period and has directed the contractor to rectify the positive pressure situation by September 1998. The contractor has begun efforts to implement a configuration change in M Wing to address this problem. The currently estimated completion date for the modifications is August 1998.

The analyzed accidents in each of the BIOs for Buildings 9212 and 9215 were reviewed and the assumptions and controls associated with each of the accident scenarios were identified. Subsequently, the OSRs and building programs and procedures were reviewed to verify that the key assumptions and controls identified in the safety analysis were implemented.

A key assumption in the analysis of fire scenarios in both buildings is that the material that is released during the analyzed fires is contained in the ventilation system(s) and filtered prior to release from the building. As noted in the DOE SER, this assumption for Building 9215 is complicated by the fact that M Wing is positively pressurized. Recently, the OSRs were revised to include OSRs for Stacks 3, 38, and 48. These OSRs verify operability of the associated fans and HEPA filters by recording the differential pressure across the fan filters. Accompanying surveillances require the differential pressure readings to be taken shiftly when activities with fire hazards are being performed and to be taken weekly to verify that the HEPA filters remain operable.

However, the systems and components necessary to ensure that the assumed flow is maintained and the surveillances and tests necessary to ensure that the systems and components continue to perform these safety functions have not been included in the BIO and OSRs. For example, the hood survey program has not been included in the safety basis and the ventilation system in M Wing has not been analyzed to determine the effect of leakage paths on the analyzed scenarios.

Another key assumption in the analysis of fires in O Wing is that the hydraulic fluid utilized in the process machinery has characteristics that make it difficult to sustain a fire in this fluid. It was noted that this assumption had not been included as a Design Features for Safety in the 9215 OSRs.

During the LMES corporate ORR, two issues were identified with respect to the criticality safety requirements. The first concerns the identification of those passive design features that should be inspected to ensure that deterioration over time will not diminish their effectiveness, and this issue remains open. The second concerns the identification of those active design features that prevent an inadvertent criticality. The analysis has been completed to show that no other active design features are necessary for Phase A1 operations.

The primary means of maintaining the validity of the assumptions for the quantities of material at risk in the analyzed accidents are the controls that are established in the criticality safety analysis and implemented in the procedures for the given process or activities. Several of the accident scenarios were reviewed to verify that the allowed quantities of material in the associated processes were less than the quantities used in the safety analysis. While a number of the processes were identified to have material limits less than the assumed quantities in the safety analysis, some processes were identified that may allow higher amounts of material than that used in the analysis. These processes include E-Wing casting batch make-up and the consolidation of material from the E-Wing Dry Vacuum traps.

Interviews: None

Shift Performance: None

<u>Conclusion:</u> The hazards and risks associated with EUO Phase A1 operations and the associated mitigating measures have been identified. The BIOs and OSRs have been reviewed and approved by DOE YSO. However, not all of the controls identified in the hazards analysis have been included for implementation in the facility safety documentation. These controls include the measures necessary to ensure that the ventilation systems operate as assumed in the analysis and that material at risk in the processes is less than or equal to the quantity assumed during the analysis. The criteria for this objective have not been met.

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Issue(s):

- Assumptions and controls identified in the BIO safety analysis for the facility ventilation systems have not been included in the OSRs as part of the facility safety basis. (SE1-1)
- The material at risk that was assumed in the analysis of some accidents may not match the material at risk that is allowed in the process. (SE1-2)
- The assumption in the safety analysis that the hydraulic oil in use in O Wing is highly resistant to fire is not included as a Design Feature for Safety in the 9215 OSR. (SE1-3)

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR DEFICIENCY FORM
Safety Envelope Verification

Functional Area: SE	Objective No.: 1	Finding X Observ.	Pre-Start X Post Start	Issue No.: SE1-1 Rev.: 0 Date: May 13, 1998

ISSUE: Assumptions and controls identified in the BIO safety analysis for the facility ventilation systems have not been included in the OSRs as part of the facility safety basis.

REQUIREMENT: Facility safety documentation is in place that describes the "safety envelope" of the facility. The safety documentation should characterize the hazards/risks associated with the facility and should identify mitigating measures (systems, procedures, administrative controls, etc.) that protect workers and the public from those hazards/risks.

The safety documentation addresses appropriate hazards/risks associated with operations necessary to protect the public, workers, and the environment from the safety and health hazards posed by the facility. The safety basis to be analyzed shall include management, design, construction, operation, and engineering characteristics necessary to protect the public, workers, and the environment from the safety and health hazards posed by the nuclear facility or nonfacility operations. All contractors shall be held responsible for adhering to assumptions and commitments set forth in the safety analysis.

REFERENCE(S): DOE O 425.1; DOE Order 5480.23, para 8; S/RID FA Safety Analysis (SA) LMES ID #10561 and #10562.

DISCUSSION: A key assumption in the analysis of fire scenarios in both buildings is that the material that is released during the analyzed fires is contained in the ventilation system(s) and filtered prior to release from the building. As noted in the DOE SER, this assumption for Building 9215 is complicated by the fact that M Wing is positively pressurized. Recently, the OSRs were revised to include OSRs for Stacks 3, 38, and 48. These OSRs verify operability of the associated fans and HEPA filters by recording the differential pressure across the fan filters. Accompanying surveillances require the differential pressure readings to be taken shiftly when activities with fire hazards are being performed and to be taken weekly to verify that the HEPA filters remain operable. However, the systems and components necessary to ensure that the assumed flow is maintained and the surveillances and tests necessary to ensure that the systems and components continue to perform these safety functions have not been included in the BIO and OSRs. For example, the hood survey program has not been included in the OSRs as a safety basis program and the ventilation in M Wing has not been analyzed to determine the effect of leakage paths on the analyzed scenarios.

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The facility has taken steps to implement programs and procedures to ensure that the assumptions regarding the ventilation systems are maintained. Recently, the hood survey program procedures were upgraded and the hoods were tested to ensure that adequate ventilation flow was available in the hoods with activities that had the potential for fires. The requirement for hood surveys has been added to the buildings' "Other Schedule" for tracking. Additionally, the start-up test program verified that the ventilation systems for Stacks 38 and 48 were properly balanced, that flow was sufficient in the M Wing chip packing hood, and that flow was into the machine hoods for those machines with hoods. More recently, the facility verified that the machines scheduled to be used in Phase A1 have either hoods or "snouts." Finally, most operating procedures require the operators to confirm flow into the hood or machine prior to use.

CONCLUSION: In order to ensure that they receive the necessary level of formality and rigor, the programs and procedures necessary for the safety of the public and workers should be included in the facility's safety basis. This is a pre-start issue.

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR DEFICIENCY FORM
Safety Envelope Verification

Functional Area: SE	**Objective No.:** 1	**Finding** X **Observ.**	**Pre-Start** X **Post Start**	**Issue No.:** SE1-2 **Rev.:** 0 **Date:** May 13, 1998

ISSUE: The material at risk that was assumed in the analysis of some accidents may not match the material at risk that is allowed in the process.

REQUIREMENT: Facility safety documentation is in place that describes the "safety envelope" of the facility. The safety documentation should characterize the hazards/risks associated with the facility and should identify mitigating measures (systems, procedures, administrative controls, etc.) that protect workers and the public from those hazards/risks.

The safety documentation addresses appropriate hazards/risks associated with operations necessary to protect the public, workers, and the environment from the safety and health hazards posed by the facility. The safety basis to be analyzed shall include management, design, construction, operation, and engineering characteristics necessary to protect the public, workers, and the environment from the safety and health hazards posed by the nuclear facility or nonfacility operations. All contractors shall be held responsible for adhering to assumptions and commitments set forth in the safety analysis.

REFERENCE(S): DOE O 425.1; DOE Order 5480.23, para 8; S/RID FA Safety Analysis (SA) LMES ID #10561 and #10562.

DISCUSSION: The primary means of maintaining the validity of the assumptions for the quantities of material at risk in the analyzed accidents are the controls that are established in the criticality safety analysis and implemented in the procedures for the given process or activities. Several of the accident scenarios were reviewed to verify that the allowed quantities of material in the associated processes were less than the quantities used in the safety analysis. While a number of the processes were identified to have material limits less than the assumed quantities in the safety analysis, some processes were identified that may allow higher amounts of material than that used in the analysis. These processes include E-Wing casting batch make-up and the consolidation of material from the E-Wing Dry Vacuum traps.

ORR DEFICIENCY FORM
Safety Envelope Verification

CONCLUSION: The material at risk that is the basis for the safety analysis must bound the material at risk in the associated processes. This is a pre-start issue.

Inspector: David I. Ødland	Team Leader: Jeffry L. Roberson

ORR DEFICIENCY FORM
Safety Envelope Verification

Functional Area: SE	Objective No.: 1	Finding X Observ.	Pre-Start Post Start X	Issue No.: SE1-3 Rev.: 0 Date: May 13, 1998

ISSUE: The assumption in the safety analysis that the hydraulic oil in use in O-Wing is highly resistant to fire is not included as a Design Feature for Safety in the 9215 OSR.

REQUIREMENT: Facility safety documentation is in place that describes the "safety envelope" of the facility. The safety documentation should characterize the hazards/risks associated with the facility and should identify mitigating measures (systems, procedures, administrative controls, etc.) that protect workers and the public from those hazards/risks.

The safety documentation addresses appropriate hazards/risks associated with operations necessary to protect the public, workers, and the environment from the safety and health hazards posed by the facility. The safety basis to be analyzed shall include management, design, construction, operation, and engineering characteristics necessary to protect the public, workers, and the environment from the safety and health hazards posed by the nuclear facility or nonfacility operations. All contractors shall be held responsible for adhering to assumptions and commitments set forth in the safety analysis.

REFERENCE(S): DOE O 425.1; DOE Order 5480.23, para 8; S/RID FA Safety Analysis (SA) LMES ID #10561 and #10562.

DISCUSSION: A key assumption in the analysis of fires in O Wing is that the hydraulic fluid utilized in the process machinery has characteristics that make it difficult to sustain a fire in this fluid. It was noted that this assumption had not been included as a Design Features for Safety in the 9215 OSRs.

CONCLUSION: Recent analysis has shown that the sprinkler system in O Wing is capable of extinguishing hydraulic oil fires and there is also recognition on the part of facility personnel that a highly fire resistant oil is needed in this application. This is a post-start issue.

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR ASSESSMENT FORM 1
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FUNCTIONAL AREA: SE	OBJECTIVE 2, Rev. DATE: May 13, 1998	CRITERIA MET	
		YES	NO X

OBJECTIVE: A program is in place to confirm and periodically reconfirm the condition and operability of safety systems, including safety-related process systems and safety-related utility systems. This includes examinations of records of tests and calibrations of the safety system and other instruments monitoring limiting conditions of operation or that satisfy Operational Safety Requirements. All safety-related process and utility systems are currently operable and in satisfactory condition. **(CORE REQUIREMENT #5)**

Criteria

Confirmation of continued compliance with safety requirements, including clearly defined surveillance intervals and periodic self-assessments, is required by procedures. Adequate surveillance test procedures and acceptance criteria have been established to support safe operation and are consistent with the approved operating basis for the facility. (5480.22, para 9, 10, Attachment 1, Background; 5480.23, para 8, Attachment 1, section 4; S/RID FA Safety Analysis (SA) LMES ID #5953, #10596, #10568)

Completed surveillances and tests are reviewed and follow up actions are documented. (5480.22, para 9.e.; 5480.19, Chs. I and II; S/RID FA Safety Analysis (SA) LMES ID #10592, #10596)

Approach

Record Review: Review the surveillance test tracking system to assess the mechanisms used for scheduling, performing, reporting results, and dispositioning test deficiencies. Review the surveillance test program to determine that each safety requirement has a corresponding surveillance test. Review surveillance tests to determine if acceptance criteria are established and met during the performance of periodic system testing. Verify that surveillance procedures are technically correct and implement the requirement of the OSRs and the safety basis documents. Review a listing of outstanding safety system deficiencies identified through the corrective maintenance program, preventive maintenance program, surveillance test program, or other reporting process to assess the condition of facility systems to support safe operations. Review the results of QA and operations management assessments of the surveillance test program. Review bases for systems designated safety class or safety significant to assess adequacy.

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Interviews: Interview personnel associated with the surveillance test program to asses: their understanding of program requirements and responsibilities. Interview operation: and QA management to determine if self-assessments of the surveillance test program implemented and effective. Determine if corrective actions from outside evaluations a also taken into account.

Shift Performance: Observe the performance of safety system surveillance testing. W. down one or more safety-related systems to assess operability and condition, and verif that the status is consistent with the condition specified in the control room.

Record Review:

- Y/MA-7255, The Operational Safety Requirements for Building 9212 Enriched Uraniu Operation Complex (U), Rev 4, April 1998
- Y/MA-7291, The Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, Rev 2 (Corrected), March 1998
- Y/MA-7345, Initial Testing and In-Service Surveillance Program Description, Noveml 26, 1997
- Y10-37-046, Enriched Uranium Operations Surveillance Program, 2/13/98
- Building 9212 CSA/CSR Surveillance Schedule, 5/12/98
- Building 9212 OSR Surveillance Schedule, 5/8/98
- Building 9215 OSR Surveillance Schedule, 5/11/98
- Building 9215 CSA/CSR Surveillance Schedule, 5/5/98
- CSR-DVS-005, E-Wing Dry Vacuum System, Rev 1, 4/28/98
- CSR-CE/W-016, Casting Operations (East and West Lines), 5/4/98
- Y52-35-SP-4002, Dwyer dP Switch/Gage Calibration, Rev 0.0, 4/27/98
- Y53-35-TP-1903, HEPA System Testing for EUO Safety Significant Ventilation and Filtration System - Stack 48, Rev 0.0
- Y52-51-FDO-014, Wet Pipe Sprinkler System Surveillance for 9212/9215 Complex, R 1.3, 3/31/98
- Y50-35-PM-3105, CAAS ENS Power Supply PM, 9/12/97 (data sheet)
- EU-9215-RS-003, M-Wing Shift Supervisor Roundsheet, 4/17/98
- RS-EU-9212-010, E-Wing Chip Processing & Pack/Ship Operator Round Sheet, 3/27/
- Y52-37-65-004, E-Wing Casting Furnace Water Detection System Functional Test, Re 0.6, 12/17/97
- JPA-EW-DVS-0006, E-Wing Dry Vacuum Quarterly Inspection, Rev 0, 1/13/98
- Y52-37-98-025, Headhouse Fan Room Wet Vacuum Trap System Weekly Surveillanc Rev 3.3, 3/5/98
- Y53-89-ETI-402, E-Wing Casting Line Check Valve Inspection and Test, Rev 0.2, 4/23/98

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- Y52-35-SP-4002, Dwyer dP Gage Calibration, Rev 1.0, 5/8/98
- Y52-35-SP-4002, Dwyer dP Gage Calibration, Rev 1.1, 5/9/98
- Y52-53-SO-035, Surveillance and Testing of Criticality Accident Alarm System(s) for Buildings 9212, 9215, 9995, and 9998, 11/18/97
- Y50-35-MD-3102, Criticality Accident Alarm System (CAAS): Detector Replacement, 1/10/96
- Y50-35-MD-3100, GA-6 Radiation Detectors Annual Preventive Maintenance and Post-Maintenance Testing, 8/12/95
- Y/TS-1407, Interim System Description Document for the Y-12 Plant Criticality Accident Alarm System, Rev 0, September 21, 1995
- Y/ENG/SAD-021, System Analysis Document Criticality Accident Alarm System, June 1994

Interviews Conducted:

- Surveillance Coordinators
- Shift Manager
- Shift Technical Advisor
- Chemical Operators
- Machinist
- Maintenance Electricians

Shift Performance Evolution:

- Machining
- Chip Packing
- Annual Vacuum Drop Test of Furnace H
- Wet Vacuum Trap Interlock Functional Test
- Stack 3 Differential Pressure Gauge Calibration
- CAAS Monthly Test for Building 9995

Discussion of Results:

Record Review: EUO has a procedure in place that governs the development and configuration control of a surveillance database that includes both OSR and CSR surveillances. It contains provisions for scheduling and performance of surveillance tests, disposition of unsatisfactory test results, disposition of out-of-tolerance measuring and test equipment, and actions for a missed surveillance. Surveillance files were well organized and documents were readily retrievable.

Review of the surveillance test schedule and surveillance files did not identify any surveillances that had been missed or due dates that were misidentified.

All of the surveillance test requirements in the OSRs were compared to the surveillance test database and no discrepancies were noted. Additionally, a sample of the CSR surveillance requirements identified no discrepancies. It should be noted that the CSRs are currently under review to ensure that all passive features that require inspection for possible degradation have been identified.

Records of completed surveillances were reviewed to verify that acceptance criteria are established and met during the performance of surveillances and to verify that procedures are technically correct and implement the requirements of the OSRs.

Two completed surveillances for Stack 48 were reviewed. The annual surveillance to calibrate the dP gages was reviewed. Acceptance criteria were adequate to demonstrate operability of the gages and procedure data was recorded correctly to demonstrate operability in all but one case. In one case, PDIS-2, the data sheet included a line-out and replacement of the acceptance criteria on the data sheet. This apparent discrepancy had not been identified by the Shift Manager or the Shift Technical Advisor during the review of the completed data sheet. When the Shift Manager was informed of the apparent discrepancy, Stack 48 was placed on administrative hold. Subsequent discussions with the Maintenance Electrician who performed the calibration revealed that the line-out was made to indicate that the initial as-found reading for the affected calibration point could not be obtained. The device was adjusted and the as-left data were within specification.

The second surveillance associated with Stack 48 was the HEPA system testing surveillance. The data sheets were reviewed. Acceptance criteria specified on the data sheets were sufficient to demonstrate operability of the HEPA filters in accordance with the OSRs. Although the penetration recorded on the data sheets was within the acceptance criteria, the data sheets were filled out incorrectly. The data sheets specify that the upstream and downstream concentration be recorded for both the data run and the verification run. However, the data recorded in each case is in percentages. This discrepancy was not noted during the reviews of the surveillance results.

The surveillance data sheets for the semi-annual wet pipe sprinkler tests for Building 9215 were reviewed. The acceptance criteria on the data sheets were specified sufficiently well to demonstrate the operability of the system in accordance with the OSRs and appropriate NFPA codes and standards. It was noted during the review that some steps of the procedure to test water flow switches were not performed (due to concerns about spreading contamination since the test valves discharge to the floor). These steps had been identified as part of the acceptance criteria for the OSR. A subsequent note from the fire protection engineer indicated that this was an error in the procedure and that the criteria were necessary only for an NFPA test. Before the procedure was revised, the surveillance test was accepted as complete based on this communication. Subsequently, the acceptance criteria were corrected in a revision to the procedure.

The data sheets for the monthly sprinkler system inspection were reviewed. The acceptance criteria were adequate to verify the operability of the system. It was noted during the review that an attached data sheet to record valve positions of OS&Y valves listed a valve for which no position was recorded. This discrepancy had not been noted during the performance or reviews of the completed surveillance.

The results of the annual inspection and test of the Furnace H cooling water return path check valve were reviewed. The acceptance criteria were clear and the test results were recorded satisfactorily. The acceptance criteria were sufficient to establish operability of the check valve. Post maintenance testing was adequate to ensure the continued operability of the check valve.

Data sheets for the semi-annual preventive maintenance of the CAAS ENS Power Supply were reviewed. The data were recorded correctly and all readings were within specification.

The roundsheet for Stacks 38 and 48 was reviewed. The roundsheet contains the readings necessary to support the required OSR surveillance for these stacks. All readings were recorded properly and were within the ranges specified on the roundsheets. The acceptance criteria meet the requirements of the OSR for operability.

The roundsheet for M-Wing was reviewed. The roundsheet contains readings and acceptance criteria for M-Wing pre-filters and HEPA filters. All readings were recorded properly and were within the ranges specified on the roundsheets. It also contains checks of the Building 9998 CAAS and the accountable vacuum producers.

The completed functional test for the E-Wing casting furnace water detection system was reviewed. The procedure adequately addresses the steps necessary to test the functions of the water detection interlock. All data were recorded correctly and acceptance criteria were met. The procedure has been performed several times and was revised six times during the month of December.

The M- and O-Wing Hold-up Survey files were reviewed. Each of the surveys have a number of points that are above the "alarm" point. Notes in the files indicate that these points are "being evaluated" in some cases for "alarm" reset. Some of the items have been above the "alarm" point and in evaluation since January; others have been in evaluation since March.

ORR ASSESSMENT FORM 1
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Several files for CSR surveillances were reviewed to verify that acceptance criteria are established and met during the performance of surveillances and to verify that procedures are technically correct and implement the requirements of the CSRs.

The file for the inspection of the backflow preventers was reviewed. The requirements for this inspection have recently been changed to include only the backflow preventers needed for criticality safety. The ET&I data sheets could not be correlated to a particular valve number, but follow up on this item identified the appropriate test documentation for the two backflow preventers covered by the CSR.

The file for the inspection of the phase separator for the high capacity evaporator was reviewed. The CSR inspection for the phase separator is performed per the C-1 Wing operator's roundsheet. It contains a check to verify that no organics and no developing reactions are present in the phase separator, as required by the applicable CSR.

The file for the inspection of the Stack 110 HEPA filter dP was reviewed. This inspection is done per the E-Wing operator's roundsheet. It contains appropriate acceptance criteria and reference to the CSR.

The file for the inspection of the East and West casting lines was reviewed. While the file shows that the inspection was completed, the data sheet provides for a visual inspection only and there are no instructions on how the inspection or verification should be performed.

Interviews: During interviews, the surveillance coordinators demonstrated an in-depth understanding of the surveillance scheduling and tracking system, including database management. The coordinators were knowledgeable of the functions of the system, use of the database, and the processing and filing of the surveillance test schedules and reports.

With the exception of the difficulties with the follow-up questions to the CAAS monthly surveillance noted below, the personnel performing the surveillance procedures demonstrated a detailed understanding of the technical aspects of the procedures.

Shift Performance: A machining evolution and transfer of chips to the chip packing station and subsequent packing of chips into the chip dolly was observed. Personnel followed the applicable procedures and demonstrated knowledge of the safety requirements related to their activities. Specifically, both the machinist and the personnel handling the chips were aware of the ventilation requirements for their evolutions.

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Safety Envelope Verification

The annual vacuum drop test (CSR) for Furnace H was observed. The test was performed in a step-by-step manner by two operators using a test procedure and the system operating JPA. The test also required a temporary modification and a maintenance package to install a calibrated gauge to support the test. The test was performed satisfactorily.

The weekly surveillance of the Wet Vacuum trap interlock was observed. Personnel completed a pre-job brief which adequately covered the procedural steps, communications, and safety aspects of the evolution. The procedure was performed in a step-by-step manner by the two chemical operators. The acceptance criteria were appropriately identified in the procedure and all acceptance criteria were met. The functional test is adequate to verify the operability of the trap interlock. The operators demonstrated a high level of knowledge of the procedure and were highly professional in their attitude and performance.

The annual calibration of the Stack 3 HEPA filter dP gages was observed. The maintenance electricians demonstrated an excellent understanding of the technical aspects of the calibration procedure and equipment. However, the initial effort to calibrate the gages had to be aborted because of confusion on the method to perform the restoration and post-maintenance test activities in a step-by-step manner. After discussing the situation with the Shift Manager, the decision was made to revise the procedure to clarify these steps. The procedure revision was prepared and the calibration surveillance recommenced using revision 1.1. The revised procedure was performed satisfactorily and the gages calibrated and returned to service.

The CAAS monthly test for the Building 9995 CAAS station was observed. Personnel conducted a pre-job brief to review the procedural steps and safety requirements for the activity. The procedure was performed satisfactorily in a step-by-step manner, however the Test Coordinator, the Plant Shift Superintendent, did not record the receipt of the alarms at the PSS office (an OSR acceptance criteria) on the data sheet.

During the data review, the Shift Manager did not identify the failure to record the required data. During follow up questioning, both the Shift Manager and the Plant Shift Superintendent demonstrated weaknesses in their understanding of the OSR Actions for the CAAS. When questioned on the actions required for the inoperability of two detector stations, the Shift Manager indicated that he would evacuate the areas covered by the circles for these detectors on the Y-12 Plant CAAS drawing. Under the same circumstances, the Plant Shift Superintendent indicated that he would evacuate all the buildings in Zone 5. The table of coverages in the OSR was not referred to by either individual and there is no procedure for this situation.

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During the observation of the surveillance, it was noted that step VII.B.8 requires notification o the Test Coordinator if the step is not satisfactory. However, the step is not identified as part of the procedure's acceptance criteria. Subsequent discussions with the responsible engineer indicated that the detector is not considered to be operable if the high radiation signal does not latch.

A follow-on review of the quarterly CAAS surveillance indicated that only the high radiation alarm functions of the CAAS detector station are tested by the surveillance. Further discussion with the responsible engineer and review of the OSR, interim system description, and system analysis document indicate that to be operable the CAAS detector station must function correctl for failure alarms and loss of power. The failure alarms are tested during the annual replacemer of the CAAS detector and the annual preventive maintenance on the detectors. However, none the tests verify the functionality of the logic cabinet to ensure that one failure and one high radiation signal or two failure signals will result in the generation of a CAAS alarm.

Walkdowns of the E-Wing Dry Vacuum System, Machine Cooling System, and portions of the Stack 3 and Stack 38 Ventilation Systems were performed during the ORR. No material deficiencies were identified during these walkdowns. During the ORR, the Stack 3 Ventilation System was administratively inoperable due to the incomplete calibration of the dP instrumentation that is necessary to support the OSR surveillances. Additionally, the E-Wing Dry Vacuum System was inoperable. Several of the casting furnaces were inoperable due to cooling water return line check valve material problems.

Conclusion: The criteria for this objective have not been met.

Issue(s):

- Safety systems necessary to support operations with enriched uranium are not operable. (SE 2-1)
- The surveillance test procedure for the CAAS does not include testing and acceptance criteria for all the system's safety related functions. (SE 2-2)

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR DEFICIENCY FORM
Safety Envelope Verification

Functional Area: SE	Objective No.: 2	Finding X Observ.	Pre-Start X Post Start	Issue No.: SE 2-1 Rev.: 0 Date: May 13, 1998

ISSUE: Safety systems necessary to support operations with enriched uranium are not operable.

REQUIREMENT: All safety-related process and utility systems are currently operable and in satisfactory condition.

REFERENCE(S): DOE O 425.1, Startup and Restart of Nuclear Facilities.

DISCUSSION: During the ORR, the Stack 3 Ventilation System was administratively inoperable due to the incomplete calibration of the dP instrumentation that is necessary to support the OSR surveillances. Additionally, the E-Wing Dry Vacuum System was inoperable, which prevented the observation of any surveillances or operations associated with this system.

CONCLUSION: Safety systems necessary to support operations with enriched uranium are not operable. This is a pre-start finding.

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR DEFICIENCY FORM
Safety Envelope Verification

Functional Area: SE	Objective No.: 2	Finding X Observ.	Pre-Start Post Start X	Issue No.: SE2-2 Rev.: 0 Date: May 13, 1998

ISSUE: The surveillance test procedure for the CAAS does not include testing and acceptance criteria for all the system's safety-related functions.

REQUIREMENT: Adequate surveillance test procedures and acceptance criteria have been established to support safe operation and are consistent with the approved operating basis for the facility.

REFERENCE(S): DOE Order 5480.22, para 9, 10, Attachment 1, Background; DOE Order 5480.23, para 8, Attachment 1, section 4; S/RID FA Safety Analysis (SA) LMES ID #5953, #10596, #10568.

DISCUSSION: The CAAS monthly test for the Building 9995 CAAS station was observed. During the observation of the surveillance, it was noted that step VII.B.8 requires notification of the Test Coordinator if the step is not satisfactory. However, the step is not identified as part of the procedure's acceptance criteria. Subsequent discussions with the responsible engineer indicated that the detector is not considered to be operable if the high radiation signal does not latch.

A follow-on review of the quarterly CAAS surveillance indicated that only the high radiation alarm functions of the CAAS detector station are tested by the surveillance. Further discussions with the responsible engineer and review of the OSR, interim system description, and system analysis document indicate that to be operable the CAAS detector station must function correctly for failure alarms and loss of power. The failure alarms for the individual detectors are tested during the annual replacement of the CAAS detector and the annual preventive maintenance on the detectors. However, none of the tests verify the functionality of the logic cabinet to ensure that one failure and one high radiation signal or two failure signals will result in the generation of a CAAS alarm. The operators perform daily rounds that verify the operability of the CAAS stations, including the status of the failure alarm and verification of detector readings.

ORR DEFICIENCY FORM
Safety Envelope Verification

CONCLUSION: An adequate OSR surveillance test program to assure the continued operability of the CAAS has not been established in that the current OSR surveillances do not contain the tests and acceptance criteria necessary to verify operability of the CAAS detection and logic circuitry. The probability of a nuclear criticality accident is low, as is the probability of a CAAS detector failure given the combination of OSR surveillance testing and preventive maintenance. Additionally, the probability of an undetected failure of the CAAS detector is low because the operators verify CAAS station operability as part of their daily rounds. Therefore, this finding is post-start.

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Safety Envelope Verification

FUNCTIONAL AREA: SE	OBJECTIVE 3, Rev. DATE: May 13, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: There are adequate and correct safety limits for operating and maintaining the designated process systems and utility systems. **(CORE REQUIREMENT #1)**

Criteria
Operating and maintenance procedures implement applicable safety requirements and the associated limiting conditions for operation. (5480.22, para 9.e, 5480.19,CH XVI; S/RID FA Safety Analysis (SA) LMES ID #10592, FA Management Systems and Technical Procedures LMES ID #5904, #5905, #6754-6771, #2777, #6026, #5918, #5908)

The parameters indicating compliance with the safety requirements can be measured or physically verified. (5480.22, para 9.e.; S/RID FA Safety Analysis (SA) LMES ID #10596)

Approach
Record Review: Select several safety requirements and determine if associated operating and maintenance procedures implement the limiting conditions for operation.

Interviews: None.

Shift Performance: Observe the performance of operating and/or maintenance rounds to determine if safety system parameters used to verify compliance with safety requirements can be accurately verified.

Record Review:

- Y/MA-7255, The Operational Safety Requirements for Building 9212 Enriched Uranium Operation Complex (U), Rev 4, April 1998
- Y/MA-7291, The Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, Rev 2 (Corrected), March 1998
- CSR-AVS-055, Accountable Vacuum System, Rev 2, 4/3/98
- CSR-DVS-005, E-Wing Dry Vacuum System, Rev 1, 4/28/98
- CSR-CE/W-016, Casting Operations (East and West Lines), 5/4/98
- Y52-35-SP-4002, Dwyer dP Switch/Gage Calibration, Rev 0.0, 4/27/98
- Y53-35-TP-1903, HEPA System Testing for EUO Safety Significant Ventilation and Filtration System - Stack 48, Rev 0.0

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- Y52-51-FDO-014, Wet Pipe Sprinkler System Surveillance for 9212/9215 Complex, Rev 1.3, 3/31/98
- Y50-35-PM-3105, CAAS ENS Power Supply PM, 9/12/97 (data sheet)
- EU-9215-RS-003, M-Wing Shift Supervisor Roundsheet, 4/17/98
- RS-EU-9212-010, E-Wing Chip Processing & Pack/Ship Operator Round Sheet, 3/27/98
- Y52-37-65-004, E-Wing Casting Furnace Water Detection System Functional Test, Rev 0.6, 12/17/97
- JPA-EW-DVS-0006, E-Wing Dry Vacuum Quarterly Inspection, Rev 0, 1/13/98
- Y52-37-98-025, Headhouse Fan Room Wet Vacuum Trap System Weekly Surveillance, Rev 3.3, 3/5/98
- Y53-89-ETI-402, E-Wing Casting Line Check Valve Inspection and Test, Rev 0.2, 4/23/98
- Y52-35-SP-4002, Dwyer dP Gage Calibration, Rev 1.0, 5/8/98
- Y52-35-SP-4002, Dwyer dP Gage Calibration, Rev 1.1, 5/9/98
- Y52-53-SO-035, Surveillance and Testing of Criticality Accident Alarm System(s) for Buildings 9212, 9215, 9995, and 9998, 11/18/97
- Y50-35-MD-3102, Criticality Accident Alarm System (CAAS): Detector Replacement, 1/10/96
- Y50-35-MD-3100, GA-6 Radiation Detectors Annual Preventive Maintenance and Post-Maintenance Testing, 8/12/95
- Y50-37-65-101, Uranium Chip Cleaning, Rev 0.2, 3/31/98
- Y50-37-65-104, Enriched Uranium Chip Drying and Briquetting, Rev 1.3, 4/24/98
- Y50-37-10-007, Uranium Chip Packing, Rev 2.3, 5/5/98
- JPA-EW-DVS-0001, E-Wing Dry Vacuum - Vacuuming Dry Material, Rev 0, 1/13/98
- JPA-EW-C-BMU-001, E-Wing Casting - Batch Make-up, Rev 3, 2/6/98
- JPA-MW-AVS-0001, M-Wing Portable Vacuum Cleaner Operation, Rev 2.1, 4/27/98
- JPA-MW-AVS-0003, Portable Vacuum Cleaner HEPA Filter Changeout, Rev 1.1, 4/3/98
- JPA-MW-AVS-0004, Portable Vacuum Cleaner Demister Filter Cleaning, Rev 0.1, 4/3/98
- JPA-OW-SCS-0001, Scrap Shear Operation, Rev 0.1, 4/17/98
- JPA-MW-AVS-0002, Portable Vacuum Cleaner Vacuum Trap Collector Changeout, Rev 0.2, 4/27/98
- Y50-37-65-530, Movement of Material between Furnaces and Furnace Lines, Rev 0.0, 4/17/98
- JPA-EW-C-C&C-0006, E-Wing Casting - Skull Burning, Rev 2, 12/15/97
- JPA-37-65-001, 9212 E-Wing Secondary Dry Vacuum trap G-2 High Level Alarm, Rev 0, 1/13/98

ORR ASSESSMENT FORM 1
Safety Envelope Verification

Interviews Conducted:

- None

Shift Performance Evolution:

- Partial observation of rounds at the Chip Cleaning station

Discussion of Results:

Record Review: Several roundsheets were reviewed to verify that the ventilation system parameters were recorded accurately and that acceptance criteria were met. The ventilation system dP gages for Stack 3 and Stack 48 were observed to ensure that the parameters could be physically verified.

Several operating procedures were reviewed to ensure that the requirements for operable ventilation were included in the procedures. No discrepancies were noted.

All the surveillance procedures that were reviewed contained measurable and physically verifiable parameters and properly implemented the requirements of the LCO's and no discrepancies were noted in the ability to read the parameters necessary to verify OSR requirements during the observation of the surveillances.

The JPAs associated with the operation of the Accountable Vacuum System were reviewed. The JPAs implement the requirements of the LCOs by requiring the operation of the M-Wing Hood Exhaust System and they also implement the appropriate CSR controls.

Interviews: None

Shift Performance: See discussion above.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None

Inspector: David J. Odland **Dave Odland**	**Team Leader:** Jeffry L. Roberson **Jeffry L. Roberson**

ORR ASSESSMENT FORM 1

Safety Envelope Verification

FUNCTIONAL AREA: SE	OBJECTIVE 4, Rev. DATE: May 13, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: The implementation status of DOE Orders 5480.22, 5480.23, and 5480.24 and associated S/RIDs are adequate for operations. Non-compliance items have been addressed. **(CORE REQUIREMENT #7)**

Criteria

All non-compliance issues are adequately addressed by DOE approved compliance schedule approvals (CSA) or exemptions. The CSAs include an adequate technical basis and schedule for attaining compliance. (Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction).

Adequate compensatory measures are specified in the CSAs as necessary, and have been effectively implemented. (Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction).

Approach

Record Review: Review order compliance packages for the listed orders, including all applicable CSAs, exemptions, and compensatory measures.

Interviews: For orders that are not fully implemented, interview management personnel to ensure they are aware of this non-compliance and the actions necessary to fully implement the order requirements, as well as any interim compensatory measures.

Shift Performance: Where appropriate, observe the implementation of any specified compensatory measures within the facility to determine their effectiveness.

Record Review:

- Y-12 Programmatic Assessment report dated 2/12/98, excerpted for DOE Orders 5480.22 and 5480.23
- DOE Standards/Requirements Identification Document Development and Approval Instruction, September 1994
- Lockheed Martin Energy Systems (LMES), Inc. And Lockheed Martin Energy Research Corp. Implementation Plan (Rev. 4) for DOE Orders 5480.23 and 5480.22, ES/ESH-67, Rev 4, January 1998

ORR ASSESSMENT FORM 1
Safety Envelope Verification

Interviews Conducted:

- None

Shift Performance Evolution:

- None

Discussion of Results:

Record Review: The review of the DOE Order Compliance packages for Orders 5480.22 and 5480.23 indicated that these two instructions were adequately implemented. DOE Order 5480.24 was reviewed under the Cricality Safety area Object CS-3 of this report.

There were no exemption requests or compensatory measures identified for these Orders, as noted in the DOE Order 5480.23 and 5480.22 Implementaion Plan.

Y-12 Programmatic Assessments were completed in August 1997 to confirm their status and they were again reviewed during the Enriched Uranium Operations (EUO) Resumption Phase A Management Self Assessment (MSA), Y/MA-7329.

A review of the facility's conformance to the applicable Standards/Requirements was completed and reported in the Management (MG) section of the report for this ORR. That review was done for Objective MG-3 and concluded that the S/RIDs were adequately implemented for the EUO Phase A1 Restart operations.

Interviews: None

Shift Performance: None

Conclusion: The criteria for this objective have been met.

Issue(s):

- None

Inspector: David J. Odland	Team Leader: Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Training

FUNCTIONAL AREA: TR	OBJECTIVE 1, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: A training support program is established, sufficient numbers of qualified training personnel are provided, and adequate facilities and equipment are available to ensure training support services are adequate for safe operations. **(CORE REQUIREMENT #8)**

Criteria
The training support organization is established and functioning to support the operations organization. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented. They are adequately staffed with qualified personnel. (5480.19, Ch. 1, section B; 10 CFR 830.120; 5700.6C ATT I, II.A.2.a; S/RID FA Training and Qualification (TQ) LMES ID #1378)

An organization/person within line management is responsible for the implementation of the training and qualification program(s). (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9658)

Training facilities and equipment are adequate to support the training process. (5480.20A Chapter I; DOE-STD-1070-94)

Instructors have the technical qualifications, including theory, practical knowledge, and experience for the subject matter they are assigned to teach. Procedures are developed and implemented to ensure that individual instructors, including on-the-job instructors meet and maintain instructional and technical position qualification requirements. (5480.20A Chapter I; 5480.19 Chapter V; S/RID FA Training and Qualification (TQ) LMES ID #9674)

A continuing instructional skills training program is implemented to maintain, improve, and update the knowledge skills of incumbent training staff based in part on the results of instructor evaluations which includes improvements needed for technical instructional knowledge and skills, the correction of identified instructional deficiencies, and training on new methods and equipment. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #10057)

Approach
Record Review: Review the documentation (e.g., administrative procedures, organizational charts, position descriptions, and internal memoranda) which establish the roles, responsibilities, interfaces, and staffing levels of the training support organization

that supports operations. Review training records for training staff personnel and on-the-job training instructors, including results of written, oral, and operational evaluations, to ensure the training program is being formally administered and controlled. Review the instructor continuing training program.

Interviews: Interview personnel to determine if they are familiar with their support and interface responsibilities to the operations organization. Interview selected personnel on training topics identified through the record review to assess the effectiveness of the instructor training program. Interview training staff and on-the-job training personnel to determine if they have sufficient experience and qualifications for training tasks assigned.

Shift Performance: Observe training evolutions, including classroom, on-the-job training sessions and simulator training sessions, if possible, to verify program implementation and effectiveness. Evaluate training facilities to determine if they are conducive to the learning process, and if classrooms and training settings are free from excessive disturbances and distractions. Evaluate the training staff's office and working spaces to determine if they are adequate to support the training being developed and presented.

Record Review:

- Oak Ridge Y-12, Enriched Uranium Operations (EUO) Restart Program Overview of January 1998
- Y-12 Operational Overview of 1997
- EUO Orientation Overview of January 1998
- Y-12 Memorandum of Understanding (MOU) to support EUO Operations with Qualified or Certified Personnel, of September 25, 1996, with supporting Y-12 MOU series of September - December 1996, and supplements of 1997 and 1998 for Y-12 Maintenance and other Y-12 Supporting Organizations
- Y-12 EUO Product Certification Organization Training and Qualification Requirements Program Plan for EUO Resumption Efforts, Revision 0, of December 31, 1996
- Y-12 Plant Conduct of Training Procedure, Y10-027, Revision 2, of November 7, 1997 with appendixes
- Y-12 Site Conduct of Operations Manual
- Y-12 Training Implementation Matrix (TIM), Y/GA-66, of December 1996, with six subsequent revision excerpts
- Y-12 Quality Program Description, Y/QD-15, of 1996
- Y-12 Training Remediation Program, Y90-090, of 1995
- Y-12 Training Matrix of Requirements of 5480.20A S/RIDs, Y10-027 of December 1996
- Y-12 EUO Resumption, Phase A Management Self Assessment (MSA) Guideline, Y/MA-7329, of October 1997

ORR ASSESSMENT FORM 1
Training

- DOE Oak Ridge Operations Office (ORO), Y-12 Site Office Assessment and Oversight Plan for EUO Phase A, at the Y-12 Plant, of August 28, 1997
- Lockheed Martin Energy Systems, Inc. (LMES) Operational Readiness Review Plan Implementation Plan for the EUO Restart Phase A at the Oak Ridge Y-12 Plant, Y/MA-7332 of December 1997
- Y-12 Type C Investigation of the Y-12 Plant Criticality Safety Approval Infractions Event at Building 9204-2E on September 22, 1994, Y/AD-622 of October 1994 with subsequent supplements
- LMES Contract DE-AC05-84OR21400, Plan of Action (POA) for the EUO Restart 97-3011, of August 25, 1997
- DOE ORO Review of the Y-12 Plant Training Implementation Matrix (TIM), Revision 6 of February 1997
- Y-12 Training and Qualification Program Descriptions, series for Phase A, Revision 2 of October 1997 for selected positions (series)
- Y-12 Task-to-Training Matrix for selected positions, Revision 0, of January 22, 1997
- Y-12 Plant Training Organization Matrix of November 13, 1996
- Y-12 EUO Process Based Restart Qualification Areas Matrix, based on Y/MA-7278 Revision 1, of October 28, 1997
- Y-12 MSA for the Support Organizations' Training and Qualification Program of 1997
- Y-12 9404 Task Training and Qualification Plan of November 1996 with the January 1998 Status report
- Report of Results of the DOE Training Assist Team Visit of April - May 1996
- LMES Y-12 EUO Training and Qualification Program Plan for Restart, Revision 0, of August 31, 1996
- Y-12 Operational Safety Requirements for Building 9212 EUO Complex, Y/MA-7255, Revision 1 of November 1997
- Y-12 Operational Safety Requirements for the 9215 Complex EUO, Y/MA-7291, of October 1997
- LMES Report of the Corporate Operational Readiness Review (LMES ORR) for the Y-12 EUO Restart Phase A, at the Oak Ridge Y-12 Plant of 14 April 1998
- DOE ORO Y-12 Site Office Assessment of EUO Phase A1 Activities at the Y-12 Plant of April 30,1998
- EUO Training and Qualification Program Descriptions (series), dated 1996 - 1998
- EUO Student Study Guides (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Courses Lessons Plans (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations

ORR ASSESSMENT FORM 1
Training

- EUO Training Student Handouts (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO On-The-Job (OJT) guidance, (series) including EUO Handling Operations
- EUO Continuing Training Plan, dated August 1997
- EUO Organization/ Personnel Matrix Diagrams (series), dated 1997 - 1998
- EUO Phase A ORR In-brief dated May 1998 for the Status of Actions and Corrective Actions
- Selected EUO (series) reports for Training, including attendance, report of training attended and training due/overdue, and Individual Training History reports
- Y-12 Training Staff Training and Qualification Program Description dated 1996
- EUO Training Staff and Instructors Guide, undated
- Training Records (32) for Operators, Maintenance and Support Personnel, Instructors, including Non-Resident Personnel (12), with selected General Record of Qualification (GRQ) reports, and Training and Qualification Program Descriptions (TQPD) (Series; samples)
- EUO Operators, Maintenance and Support Personnel List of Qualification Status as of May 1998 (series)
- Draft changes to EUO Training Processes and Administration, as of May 1998, series, including sections for the revision of the Y-12 Plant Conduct of Training Procedure Y10-027
- DOE Order 5480.20A Compliance Package Report of Status and Action for EUO/Y-12, cross referenced to Y10-027 Y-12 Plant Conduct of Training Procedure, Appendix B
- EUO MAA Access Self-Study Guide, Module 14711 of March 9, 1998
- EUO MAA Access Lesson Plan of 12/30/97
- EUO 9211/9215 Continuing Training Schedules of April-May 1998 (series)
- Example and Excerpted TMS Status Reports and Printouts
- EUO Training Implementation Matrix status report of March 9, 1998
- EUO Training and Qualification (T&Q) Implementation Plan and Assessment Schedule (series) with updates
- ESAMS Issue Response Report for EUO for the status of EUO related Training items of March - May 1998 (series)
- EUO 9212/9215 Minimum Staffing Requirements, Y/MA-7322 excerpts
- EUO PBR Qualification and Process Assignments requirements, EUO-Y/MA-7278 excerpts
- EUO OJT Job Performance Aid (JPA)/Performance Demonstration Checklist (PDC), and OJT Evaluation Sheet for EUO Operators (series)
- EUO Building 9212 Qualification Book
- EUO Building 9215 Qualification Book

ORR ASSESSMENT FORM 1
Training

Interviews Conducted:

- Y-12 Training Manager
- DOE YSO Training Manager
- EUO Training Manager
- EUO Assistant Training Manager
- EUO Training Lead
- EUO Training Assistants and Instructors (5)
- EUO On-The-Job (OJT) Training Instructors (5)
- EUO OJT and Training Coordinator (2)
- EUO General Training and Support Assistant
- Y-12 RadCon Training Manager
- Y-12 FMO Training Manager
- Y-12 Nuclear Criticality Safety Training Manager
- Y-12 Fire Department Training Manager
- Y-12 Plant Shift Superintendent Training Manager
- Y-12 Production and Certification Training Manager
- Y-12 Engineering Support Training Manager
- Y-12 Technical Training Assistant
- Y-12 Training Records Coordinator
- EUO Training Records Coordinator
- EUO Training Scheduler and Registrar
- EUO Facility Assistant
- YSO Facility Representative (FR)
- EUO Operations Manager
- EUO Shift Operations Managers (SOM) (2)
- EUO Production Manager
- EUO Supervisors (7)
- EUO Operators, Maintenance, and Support Personnel (27)

Shift Performance Evolution:

- EUO Facility Entrance Familiarization Overview Training
- EUO Routine, Daily Operations in preparation for Phase A
- EUO Classroom Training (2)
- EUO OJT-JPA-PDC for Operators (2)
- EUO Drills/Off-Normal Event Drills (2)
- EUO Example/Simulated Phase A Handling and Operations Evolutions
- Y-12 Classroom Session
- EUO Demonstration of Training Management System (TMS)

- Tour of EUO and Y-12 Training Facilities, including the Y-12 Center for Continuing Education (CCE)
- Observation of Y-12 RadWorker II Practical Demonstration Training Walkthrough
- EUO Process Training Walkdown with EUO Training Instructors (2)

Discussion of Results:

Record Review: Three months ago a new EUO Training Manager was appointed due to problems within the EUO Training and Qualification Program. Since that time she has initiated many changes to the organization and administration of the EUO Training and Qualification Program.

For example, the EUO Training Manager recently designated instructors from training to assist the EUO supervisors in tracking qualification status of their personnel. Discussions with those instructors and EUO supervisors indicated that the actual qualification tracking assistance started on May 4, 1998. This action should help to address the major problem within the EUO training process, the "management of qualification," but it is too early to make that determination. The problem of the "management of qualification" is discussed within the Training Objective TR.2 text, and the Pre-Start Finding TR.2-1 of this report.

The new EUO Training Manager has also started to change the training organization's internal development, improvement, and handling of course and training materials. These are among the actions initiated to correct the twelve Pre-Start and six Post Start Training Findings from the YSO Assessment of April 30, 1998 and the LMES ORR of April 14, 1998.

The review of the existing Y-12 and Enriched Uranium Operations (EUO) documentation (and available drafts/changes now in development) including Y-12/EUO administrative procedures, organizational charts, position descriptions, and internal memoranda indicated that this documentation adequately establishes the EUO Training roles, responsibilities, and interfaces. This review also indicated that the EUO staffing levels of the training support organization are adequate.

The review of the EUO training records for training staff personnel and On-The-Job training instructors, including results of written, oral, and operational evaluations, indicated that overall, the training program is being adequately administered for initial training and qualification. However, not all of the organizations that operate and support the EUO have conducted the periodic evaluations and training for the instructors to ensure that they are effective and current.

For example, some EUO Operations, Maintenance, and Support organizations have not been conducting the annual evaluations of their OJT Instructors, cited as an LMES requirement. During interviews, discussions and observations some OJT Instructors said that they had never been evaluated as an OJT Instructor since their initial designation.

This problem was recognized by the new EUO Training Manager and she initiated corrective actions to include reducing the number of designated EUO OJT Instructors. Based on her review of each of the instructors active participation in the EUO Restart training and her evaluation of their technical training expertise, she extended the requirement for an evaluation of the EUO Instructors and OJT Instructors to December 31, 1998. Again, these efforts have also been focused to ensure that the training for the personnel designated for the EUO Phase A1 Minimum Staffing Level for Restart should meet their requirements.

In the Maintenance and other Support organizations, however, this weakness had not been fully identified.

In the aggregate, this problem demonstrates one aspect of the problem of the "management of qualification," e.g. to ensure that the OJT Instructors were periodically evaluated to ensure their technical competence and skill as they trained their personnel for the EUO Restart effort. This is considered to be one of the segments of the Pre-Start Finding TR.2-1 on the "management of qualification."

The review of Instructor and OJT Instructor training records indicated that there were no reports of periodic Instructor Evaluations in the records. This confirmed the problem identified that OJT Instructors were not being periodically evaluated as required by LMES. Some administrative deficiencies were also noted in the individual personnel training files, including for example some missing items such as examinations or examination cover sheets, and the use of "white-out" in corrections of the recording of dates.

Interviews: Interviews with EUO training personnel indicated that they are familiar with their support and interface responsibilities and can adequately support the operations organization.

Supporting interviews with operations and maintenance personnel, and the respective organizational training managers, indicated that their training support organizations should adequately support the EUO Phase A1 Restart operations, when the LMES ORR and YSO Assessment Pre-Start corrective actions that are in progress now, are completed.

These interviews also indicated that the EUO Instructors have adequate technical expertise, sufficient experience, and adequate initial qualifications for the training tasks assigned.

Shift Performance: Observation of EUO training evolutions, supported the conclusions of the Record Review and the Interviews.

During this ORR, an effective working relationship between the YSO Training Manager, Y-12 Training Manager, and the EUO Training Manager was demonstrated.

ORR ASSESSMENT FORM 1
Training

The Y-12 and EUO facilities that are used for EUO training are conducive to the learning process, and the classrooms and training settings are adequately free from disturbances and distractions. The training staff's office and working spaces are satisfactory to support the training being developed and presented by the staff.

The EUO Training Organization demonstrated that they understand that they support the EUO operations line management, and that the requisite line management responsibility for the implementation of the training and qualification program, rests within the EUO operational organization up to the EUO Facility Manager.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None.

Inspector: Robert Baeder	Team Leader: Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Training

FUNCTIONAL AREA: TR	OBJECTIVE 2, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES	NO X

OBJECTIVE: Training and qualification programs for operations and operations support personnel have been established, documented, and implemented. (**CORE REQUIREMENT #2**)

Criteria

Procedures are developed and implemented that describe the qualification process, including examinations for certification of operations and maintenance personnel, requalification, maintenance of proficiency, granting of exceptions and extensions, alternatives to educational requirements, remediation, and evaluations by facility and training management. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9677)

Goals, objectives, and plans are in place to describe the implementation of the training and qualification programs. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9680, #9743)

Classroom training is conducted in accordance with formal lesson plans based on established learning objectives. Written and oral examinations are used to evaluate trainee comprehension of training content. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9683)

Training programs incorporate formal on-the-job training (OJT) and hands-on evaluation of skills. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9675, #9681)

The qualification program includes requirements for successful completion of written, oral, and operational evaluations for operations and maintenance personnel. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9675, #9676)

Procedures are in place to ensure that non-resident personnel should receive the proper training for unescorted access to EUO operations areas and that they are current in their training requirements. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9691, #9692)

ORR ASSESSMENT FORM 1

Training

Approach

Record Review: Review training and qualification records for operators, maintenance personnel, shift technical engineers, and supervisors, including results of written, oral and operational evaluations, to ensure the training program is being formally administered and controlled. Training records are maintained in an auditable manner and support management information needs by providing required data on each individual's training participation, performance, and qualification/certification.

Review the evaluation/self-assessment program for involvement by facility and training management in program, instructor (classroom and OJT), and training materials assessment.

Review the remedial training program for adequacy.

Review the Building 9212 and 9215 access control procedures for positive control of non-resident personnel. Review training records of 10 non-resident personnel with access to EUO operating areas for currency in required training for unescorted access.

Review the written goals and objectives related to the implementation of the training and qualification processes and ensure they are documented in strategic plans, and mission statements and that the goals and objectives adequately address the current issues that are important to both contractor management and DOE.

Interviews: Interview training personnel to determine if they have sufficient experience and qualifications for assessing operations and maintenance personnel.

Shift Performance: Observe operator, operations support personnel, or supervisor examinations, by attending oral or operational evaluations (OJT), or simulator training sessions. Verify that personnel demonstrate knowledge of activities and evolutions that were included in their training program.

Record Review:

- Oak Ridge Y-12, Enriched Uranium Operations (EUO) Restart Program Overview of January 1998
- Y-12 Operational Overview of 1997
- EUO Orientation Overview of January 1998
- Y-12 Memorandum of Understanding (MOU) to support EUO Operations with Qualified or Certified Personnel, of September 25, 1996, with supporting Y-12 MOU series of September - December 1996, and supplements of 1997 and 1998 for Y-12 Maintenance and other Y-12 Supporting Organizations

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Training

- Y-12 EUO Product Certification Organization Training and Qualification Requirements Program Plan for EUO Resumption Efforts, Revision 0, of December 31, 1996
- Y-12 Plant Conduct of Training Procedure, Y10-027, Revision 2, of November 7, 1997 with appendixes
- Y-12 Site Conduct of Operations Manual
- Y-12 Training Implementation Matrix (TIM), Y/GA-66, of December 1996, with six subsequent revision excerpts
- Y-12 Quality Program Description, Y/QD-15, of 1996
- Y-12 Training Remediation Program, Y90-090, of 1995
- Y-12 Training Matrix of Requirements of 5480.20A S/RIDs, Y10-027 of December 1996
- Y-12 EUO Resumption, Phase A Management Self Assessment (MSA) Guideline, Y/MA-7329, of October 1997
- DOE Oak Ridge Operations Office (ORO), Y-12 Site Office Assessment and Oversight Plan for EUO Phase A, at the Y-12 Plant, of August 28, 1997
- Lockheed Martin Energy Systems, Inc. (LMES) Operational Readiness Review Plan Implementation Plan for the EUO Restart Phase A at the Oak Ridge Y-12 Plant, Y/MA-7332 of December 1997
- Y-12 Type C Investigation of the Y-12 Plant Criticality Safety Approval Infractions Event at Building 9204-2E on September 22, 1994, Y/AD-622 of October 1994 with subsequent supplements
- LMES Contract DE-AC05-84OR21400, Plan of Action (POA) for the EUO Restart 97-3011, of August 25, 1997
- DOE ORO Review of the Y-12 Plant Training Implementation Matrix (TIM), Revision 6 of February 1997
- Y-12 Training and Qualification Program Descriptions, series for Phase A, Revision 2 of October 1997 for selected positions (series)
- Y-12 Task-to-Training Matrix for selected positions, Revision 0, of January 22, 1997
- Y-12 Plant Training Organization Matrix of November 13, 1996
- Y-12 EUO Process Based Restart Qualification Areas Matrix, based on Y/MA-7278 Revision 1, of October 28, 1997
- Y-12 MSA for the Support Organizations' Training and Qualification Program of 1997
- Y-12 9404 Task Training and Qualification Plan of November 1996 with the January 1998 Status report
- Report of Results of the DOE Training Assist Team Visit of April - May 1996
- LMES Y-12 EUO Training and Qualification Program Plan for Restart, Revision 0, of August 31, 1996
- Y-12 Operational Safety Requirements for Building 9212 EUO Complex, Y/MA-7255, Revision 1 of November 1997
- Y-12 Operational Safety Requirements for the 9215 Complex EUO, Y/MA-7291, of October 1997

ORR ASSESSMENT FORM 1

Training

- LMES Report of the Corporate Operational Readiness Review (LMES ORR) for the Y-12 EUO Restart Phase A, at the Oak Ridge Y-12 Plant of 14 April 1998
- DOE ORO Y-12 Site Office Assessment of EUO Phase A1 Activities at the Y-12 Plant of April 30,1998
- EUO Training and Qualification Program Descriptions (series), dated 1996 - 1998
- EUO Student Study Guides (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Courses Lessons Plans (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
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- EUO On-The-Job (OJT) guidance, (series) including EUO Handling Operations
- EUO Continuing Training Plan, dated August 1997
- EUO Organization/ Personnel Matrix Diagrams (series), dated 1997 - 1998
- EUO Phase A ORR In-brief dated May 1998 for the Status of Actions and Corrective Actions
- Selected EUO (series) reports for Training, including attendance, report of training attended and training due/overdue, and Individual Training History reports
- Y-12 Training Staff Training and Qualification Program Description dated 1996
- EUO Training Staff and Instructors Guide, undated
- Training Records (32) for Operators, Maintenance and Support Personnel, Instructors, including Non-Resident Personnel (12), with selected General Record of Qualification (GRQ) reports, and Training and Qualification Program Descriptions (TQPD) (Series; samples)
- EUO Operators, Maintenance and Support Personnel List of Qualification Status as of May 1998 (series)
- Draft changes to EUO Training Processes and Administration, as of May 1998, series, including sections for the revision of the Y-12 Plant Conduct of Training Procedure Y10-027
- DOE Order 5480.20A Compliance Package Report of Status and Action for EUO/Y-12, cross referenced to Y10-027 Y-12 Plant Conduct of Training Procedure, Appendix B
- EUO MAA Access Self-Study Guide, Module 14711 of March 9, 1998
- EUO MAA Access Lesson Plan of 12/30/97
- EUO 9211/9215 Continuing Training Schedules of April-May 1998 (series)
- Example and Excerpted TMS Status Reports and Printouts
- EUO Training Implementation Matrix status report of March 9, 1998
- EUO Training and Qualification (T&Q) Implementation Plan and Assessment Schedule (series) with updates

ORR ASSESSMENT FORM 1
Training

- ESAMS Issue Response Report for EUO for the status of EUO related Training items of March - May 1998 (series)
- EUO 9212/9215 Minimum Staffing Requirements, Y/MA-7322 excerpts
- EUO PBR Qualification and Process Assignments requirements, EUO-Y/MA-7278 excerpts
- EUO OJT Job Performance Aid (JPA)/Performance Demonstration Checklist (PDC), and OJT Evaluation Sheet for EUO Operators (series)
- EUO Building 9212 Qualification Book
- EUO Building 9215 Qualification Book

Interviews Conducted:

- Y-12 Training Manager
- DOE YSO Training Manager
- EUO Training Manager
- EUO Assistant Training Manager
- EUO Training Lead
- EUO Training Assistants and Instructors (5)
- EUO On-The-Job (OJT) Training Instructors (5)
- EUO OJT and Training Coordinator (2)
- EUO General Training and Support Assistant
- Y-12 RadCon Training Manager
- Y-12 FMO Training Manager
- Y-12 Nuclear Criticality Safety Training Manager
- Y-12 Fire Department Training Manager
- Y-12 Plant Shift Superintendent Training Manager
- Y-12 Production and Certification Training Manager
- Y-12 Engineering Support Training Manager
- Y-12 Technical Training Assistant
- Y-12 Training Records Coordinator
- EUO Training Records Coordinator
- EUO Training Scheduler and Registrar
- EUO Facility Assistant
- YSO Facility Representative (FR)
- EUO Operations Manager
- EUO Shift Operations Managers (SOM) (2)
- EUO Production Manager
- EUO Supervisors (7)
- EUO Operators, Maintenance, and Support Personnel (27)

ORR ASSESSMENT FORM 1
Training

Shift Performance Evolution:

- EUO Facility Entrance Familiarization Overview Training
- EUO Routine, Daily Operations in preparation for Phase A
- EUO Classroom Training (2)
- EUO OJT-JPA-PDC for Operators (2)
- EUO Drills/Off-Normal Event Drills (2)
- EUO Example/Simulated Phase A Handling and Operations Evolutions
- Y-12 Classroom Session
- EUO Demonstration of Training Management System (TMS)
- Tour of EUO and Y-12 Training Facilities, including the Y-12 Center for Continuing Education (CCE)
- Observation of Y-12 RadWorker II Practical Demonstration Training Walkthrough
- EUO Process Training Walkdown with EUO Training Instructors (2)

Discussion of Results:

Record Review: Three months ago a new EUO Training Manager was appointed due to problems within the EUO Training and Qualification Program. Since that time she has initiated many changes to the organization and administration of the EUO Training and Qualification Program.

For example, the EUO Training Manager recently designated instructors from training to assist the EUO supervisors in tracking the qualification status of their personnel. Discussions with those instructors and EUO supervisors indicated that the actual qualification tracking assistance started on May 4, 1998. This action should help to address the major problem within the EUO training process, the "management of qualification," but it is too early to make that determination. The problem of the "management of qualification" is discussed further within this text, and the Pre-Start Finding TR2-1 of this report.

The review of the associated EUO training and qualification records for operators, maintenance, and support personnel indicated that generally the training records are being adequately administered and controlled.

Some administrative deficiencies were noted in the individual personnel training files. There are also some administrative differences and inconsistencies in the manner of the compilation and content of the files. For example some records have examination cover sheets only while others have the cover sheets and the questions that were asked. Some records had incorrect methods of "strike-overs," "write-overs, " or the use of "white-out," without initialing and justification in training record entries.

ORR ASSESSMENT FORM 1
Training

The training records include the results of examinations, such that they are administratively maintained in an adequate manner. These records provide sufficient data on each individual's training participation, performance, and qualification/certification, however, they are cumbersome.

The new EUO Training Manager has established goals, objectives, and plans to improve the implementation of the training and qualification programs. It was not apparent that those aspects of the management of the training and qualification programs were previously established.

Classroom training is conducted in accordance with formal lesson plans based on established learning objectives. Evaluations of this training include either a written examination, an oral examination, or both.

While these programs adequately incorporate on-the-job training (OJT) and hands-on evaluation of skills to support EUO training, the inadequate implementation of the OJT Instructor periodic evaluation process was discussed within TR.1.

The EUO qualification program adequately includes requirements for the successful completion of written, oral, and operational evaluations for operations and maintenance personnel.

EUO procedures are in place to adequately ensure that non-resident personnel should receive the proper training for unescorted access to EUO operations areas, or they should be escorted as needed.

The training self-assessment program is undergoing recent improvements.

The existing EUO remedial training program is being revised to correct existing deficiencies and for incorporation into the next revision of the Y10-027 Y-12 Plant Conduct of Training Procedure.

The Building 9212 and 9215 access control procedures for non-resident personnel training are adequate.

The most significant problems in the EUO Training and Qualification Program are illustrated by the ten Training Findings (six Pre-Start and four Post Start Findings) of the recently completed Corporate Operational Readiness Review (LMES ORR), and the eight Training Findings (six Pre-Start and two Post Start Findings) of the DOE Y-12 Site Office Assessment (YSO).

Considering the collective breadth and depth of the context of these findings, they do indicate the problems associated the "management of qualification." These findings indicated a problem in ensuring exactly who is qualified, provisionally qualified, qualified/certified, provisionally qualified/certified, and due for requalification, periodic evaluation, or fully qualified and proficient. These deficiencies were indicated in all personnel areas including Operators, Maintenance Personnel, Support Personnel, and the EUO Mentors.

Examples include:

"- Fire Department Personnel were not qualified according to the TMS (YSO Pre-Start).
- Position Task Lists were not updated for job scope changes (YSO Pre-Start).
- The FMO Qualification Program did not include training on the Y-12 Procedure policy (YSO Pre-Start).
- The DUO had not provided the list of some of their trained maintenance personnel usage to the 9215 Shift Manager.
- All of the EUO qualified/certified personnel had not completed their JPA training (YSO Pre-Start).
- The OJT was not controlled by the operations personnel, and some of the training was done by personnel who were qualified or certified in the positions that they were training and evaluating (YSO Post Start).
- The EUO Qualification/Certification Lists and TIM had not been updated, such that the LMES ORR reported that in one area a Qualified Supervisor was supervising Certified Personnel (LMES ORR Pre-Start).
- Some personnel who were conducting operational evaluations and performance documentation checklists were not qualified (LMES ORR Pre-Start).
- EUO operations personnel were performing duties without meeting all of the training requirements (LMES ORR Pre-Start).
- Some maintenance personnel were working on EUO safety systems without all of the required training (LMES ORR Pre-Start).
- Qualification programs for certified positions did not always ensure personnel were properly qualified (LMES ORR Pre-Start).
- The training program for the EUO mentors was not defined (LMES ORR Post Start)."

Four of the six LMES ORR Pre-Start and two of the LMES ORR Post Start Findings directly brought into question the qualification and certification programs (for operators, maintenance personnel, certified personnel, supervisors, and the EUO mentors who are actively involved in the restart efforts). During this ORR, it was reported that some management personnel questioned the significance of these qualification problems.

Many of the EUO personnel are "provisionally qualified." Many of those equipments and systems will be operated for the first time by those personnel as they complete their full qualification (i.e. then they would no longer be "provisionally qualified"). Problems with the "management of qualification" may make this difficult to accomplish.

ORR ASSESSMENT FORM 1
Training

This problem has been identified within the past two years by many assessments such as the Management Self-Assessment or an even earlier Training Assistance Team (TAT) visit to EUO in 1996. It appears that their overall results point to some problems with the EUO "management of qualification."

Additionally, during this ORR, the records reviews, observations, and interviews supported the YSO, LMES ORR, and TAT reported results, recommendations, and conclusions.

For example during interviews and discussions, with eighteen EUO and support personnel, twelve were not sure if they were "qualified" or "provisionally qualified." None of those personnel who thought they were "provisionally qualified" were sure of what they had to do to become "qualified." Some of the supervisors were also unsure if their personnel were "qualified" or "provisionally qualified," and again some supervisors were unsure of what would be required for their personnel to become "qualified."

It was reported that the completion of the corrective actions and review for the DOE YSO Training Findings have now entered the official LMES/Y-12/EUO Operational Safety Board (OSB) closure process as of about April 30, 1998. Meanwhile, the actions of the LMES ORR Pre-Start Finding Corrective Actions are now in progress. Thus, it was not possible to assess the effectiveness of their completion, and it is too early to determine if these actions have or should fix the problems in the "management of qualification."

The corrective actions completed for the earlier Y-12/EUO "qualification problem signposts" of the TAT, MSA, and other YSO and Contractor assessments were apparently not effective in correcting and resolving the associated problems. Thus, the LMES ORR concluded that as of April 14, 1998, ". . . Individuals who had not received necessary training were allowed to continue performing their normal duties."

Thus for the areas of Training and Qualification, the EUO processes and procedures are not adequately implemented to ensure that all operations, maintenance, and support personnel have completed their qualification, certification, and proficiency requirements. (TR2-1)

Interviews: Interviews with EUO training personnel indicated that they have sufficient experience and qualifications for assessing operations and maintenance personnel. These interviews included discussions on: classroom training, qualification processes, and the training program. These interviews indicated that the EUO training personnel can adequately support training.

ORR ASSESSMENT FORM 1
Training

Supporting interviews with operations and maintenance personnel, and the respective organizational training managers, indicated that their training support organizations should adequately support the EUO Phase A1 Restart operations, when the LMES ORR and YSO Assessment Pre-Starts corrective actions that are in progress now, are completed.

Shift Performance: Observation of operators and support personnel, during the training evolutions, and operations conducted during this ORR indicated that these personnel adequately demonstrated knowledge of activities and evolutions that were included in their training program.

Other deficiencies that directly related to training or qualification, or that may require additional training or changes in the qualification process were cited in the functional areas of Configuration Management (CM), Maintenance (MT), Operations (OP), and Radiological Protection (RP).

During this ORR, an effective working relationship between the YSO Training Manager, Y-12 Training Manager, and the EUO Training Manager was demonstrated.

Conclusion: The criteria for this objective have not been met.

Issue(s):

- The EUO processes and procedures are not adequately implemented to ensure that all operations, maintenance, and support personnel have completed their qualification, certification, and proficiency requirements. (TR2-1)

Inspector: Robert Baeder	Team Leader: Jeffry L. Roberson

ORR DEFICIENCY FORM
Training

Functional Area: TR	Objective No.: 2	Finding X Observ.	Pre-Start X Post Start	Issue No.: TR2-1 Rev.: 0 Date: May 12, 1998

ISSUE: The EUO processes and procedures are not adequately implemented to ensure that all operations, maintenance, and support personnel have completed their qualification, certification, and proficiency requirements.

REQUIREMENT: Procedures are developed and implemented that describe the qualification process, including examinations for certification of operations and maintenance personnel, requalification, maintenance of proficiency, granting of exceptions and extensions, alternatives to educational requirements, remediation, and evaluations by facility and training management.

REFERENCE(S): DOE Order 5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9677.

DISCUSSION: The most significant training and qualification problem is the "management of qualification." This scope of this problem is illustrated by the ten Training Findings (six Pre-Start and four Post Start Findings) of the recently completed LMES Operational Readiness Review (LMES ORR), and the eight Training Findings (six Pre-Start and two Post Start Findings) of the DOE Y-12 Site Office Assessment (YSO). Both of these assessments were completed in April 1998, a very short time before the commencement of this ORR.

Considering the breadth, depth, and context of those Training Findings, they indicate problems associated with ensuring exactly who is qualified, provisionally qualified, qualified/certified, provisionally qualified/certified, and due for requalification, periodic evaluation, or fully qualified and proficient. These deficiencies were indicated in all personnel areas including EUO Operators, Maintenance Personnel, Support Personnel, and the EUO Mentors. Additional details on those findings are discussed in Training Objective TR.2.

Three months ago a new EUO Training Manager was appointed due to problems within the EUO Training and Qualification Program. She recently designated instructors from training to assist the EUO supervisors in tracking the qualification status of their personnel, which started on May 4, 1998. This is an example of the present status of some of the corrective actions now in progress at EUO. Thus, it was not possible to assess the effectiveness of their completion, and it is too early to determine if these corrective actions have or should fix the problems in the "management of qualification."

ORR DEFICIENCY FORM

Training

CONCLUSION: The EUO processes and procedures are not adequately implemented to ensure that all operations, maintenance, and support personnel have completed their qualification, certification, and proficiency requirements. This is a pre-start finding.

Inspector: Robert Baeder	Team Leader: Jeffry Roberson

ORR ASSESSMENT FORM 1
Training

FUNCTIONAL AREA: TR	OBJECTIVE 3, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: The training and qualification programs encompass the range of duties and activities required to be performed. **(CORE REQUIREMENT #2)**

Criteria
The tasks required for competent job performance are identified and documented through a systematic analysis of job requirements. The training program is based on the results of this analysis. Learning objectives are derived from the analysis. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9683)

Requirements for continuing training have been adequately defined and programs have been developed. Continuing training includes conduct of realistic drills to maintain proficiency in responding to abnormal and accident situations, including those involving radiological hazards. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9685)

Training programs for operations and maintenance personnel include training on the requirements contained in the approved operating basis for the facility. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9682, #9729, #9695)

Training programs for operations and maintenance personnel emphasize the importance of compliance with procedures and safety requirements. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9729, #9695)

Training for technical staff personnel is based on an assessment of position duties and responsibilities. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9697)

The training department uses post-training feedback, internal evaluations (self assessment), and operating experience to modify the training program when needed. This includes:

- Using feedback on training effectiveness from trainees and supervisors,
- Incorporating feedback from operating experience at the site and from other DOE sites,

- Conducting formal reviews of training effectiveness, and.
- Incorporation of comments from line management self-assessments and other audits. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9683)

Approach

Record Review: Review operations and maintenance lesson plans for incorporation of safety requirements, technical safety requirements, operational safety requirements, and procedure compliance. Review trainee feedback forms, training evaluations of lessons learned from operating experiences, and formal training program reviews to verify feedback is addressed in a formal manner. Review the continuing training program plan and drill schedule to verify its adequacy to support safe operations.

Review the systematic analysis of job requirements conducted to provide reasonable assurance that all tasks that are essential to safe and efficient operation are addressed by the training program.

Review to ensure that subject matter experts, line management, and training staff develop and maintain a valid facility-specific task list as the basis for the training program. The facility-specific list of tasks selected for training is reviewed periodically and updated as necessary by changes in procedures, facility systems/equipment, job scope, and advances in technology. DOE and other appropriate training guidelines are used as a guide for selecting, sequencing, and verifying training program structure and content.

Verify that the current facility safety analysis report, operating procedures, technical and professional references, and facility/industry operating experience are used to identify facility specific training content and information for use in developing training materials.

Review the degree to which on-the-job training and hands-on evaluations for operations and maintenance personnel are used to reinforce classroom activities.

Review examinations (both written and oral) and performance evaluations to verify that they are based on learning objectives, are reviewed by SMEs, are changed frequently enough to avoid compromise, and are formally controlled.

Interviews: Interview training personnel responsible for continuing training, and drill scenario development and implementation. Interview personnel responsible for establishing training needs for operations and maintenance personnel.

ORR ASSESSMENT FORM 1
Training

Shift Performance: Observe operator and maintenance personnel response to drills. Evaluate a continuing training classroom lecture, simulator training session, or field training activity for technical and administrative adequacy.

Record Review:

- Oak Ridge Y-12, Enriched Uranium Operations (EUO) Restart Program Overview of January 1998
- Y-12 Operational Overview of 1997
- EUO Orientation Overview of January 1998
- Y-12 Memorandum of Understanding (MOU) to support EUO Operations with Qualified or Certified Personnel, of September 25, 1996, with supporting Y-12 MOU series of September - December 1996, and supplements of 1997 and 1998 for Y-12 Maintenance and other Y-12 Supporting Organizations
- Y-12 EUO Product Certification Organization Training and Qualification Requirements Program Plan for EUO Resumption Efforts, Revision 0, of December 31, 1996
- Y-12 Plant Conduct of Training Procedure, Y10-027, Revision 2, of November 7, 1997 with appendixes
- Y-12 Site Conduct of Operations Manual
- Y-12 Training Implementation Matrix (TIM), Y/GA-66, of December 1996, with six subsequent revision excerpts
- Y-12 Quality Program Description, Y/QD-15, of 1996
- Y-12 Training Remediation Program, Y90-090, of 1995
- Y-12 Training Matrix of Requirements of 5480.20A S/RIDs, Y10-027 of December 1996
- Y-12 EUO Resumption, Phase A Management Self Assessment (MSA) Guideline, Y/MA-7329, of October 1997
- DOE Oak Ridge Operations Office (ORO), Y-12 Site Office Assessment and Oversight Plan for EUO Phase A, at the Y-12 Plant, of August 28, 1997
- Lockheed Martin Energy Systems, Inc. (LMES) Operational Readiness Review Plan Implementation Plan for the EUO Restart Phase A at the Oak Ridge Y-12 Plant, Y/MA-7332 of December 1997
- Y-12 Type C Investigation of the Y-12 Plant Criticality Safety Approval Infractions Event at Building 9204-2E on September 22, 1994, Y/AD-622 of October 1994 with subsequent supplements
- LMES Contract DE-AC05-84OR21400, Plan of Action (POA) for the EUO Restart 97-3011, of August 25, 1997
- DOE ORO Review of the Y-12 Plant Training Implementation Matrix (TIM), Revision 6 of February 1997
- Y-12 Training and Qualification Program Descriptions, series for Phase A, Revision 2 of October 1997 for selected positions (series)
- Y-12 Task-to-Training Matrix for selected positions, Revision 0, of January 22, 1997

ORR ASSESSMENT FORM 1
Training

- Y-12 Plant Training Organization Matrix of November 13, 1996
- Y-12 EUO Process Based Restart Qualification Areas Matrix, based on Y/MA-7278 Revision 1, of October 28, 1997
- Y-12 MSA for the Support Organizations' Training and Qualification Program of 1997
- Y-12 9404 Task Training and Qualification Plan of November 1996 with the January 1998 Status report
- Report of Results of the DOE Training Assist Team Visit of April - May 1996
- LMES Y-12 EUO Training and Qualification Program Plan for Restart, Revision 0, of August 31, 1996
- Y-12 Operational Safety Requirements for Building 9212 EUO Complex, Y/MA-7255, Revision 1 of November 1997
- Y-12 Operational Safety Requirements for the 9215 Complex EUO, Y/MA-7291, of October 1997
- LMES Report of the Corporate Operational Readiness Review (LMES ORR) for the Y-12 EUO Restart Phase A, at the Oak Ridge Y-12 Plant of 14 April 1998
- DOE ORO Y-12 Site Office Assessment of EUO Phase A1 Activities at the Y-12 Plant of April 30,1998
- EUO Training and Qualification Program Descriptions (series), dated 1996 - 1998
- EUO Student Study Guides (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Courses Lessons Plans (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
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ORR ASSESSMENT FORM 1

Training

- EUO Operators, Maintenance and Support Personnel List of Qualification Status as of May 1998 (series)
- Draft changes to EUO Training Processes and Administration, as of May 1998, series, including sections for the revision of the Y-12 Plant Conduct of Training Procedure Y10-027
- DOE Order 5480.20A Compliance Package Report of Status and Action for EUO/Y-12, cross referenced to Y10-027 Y-12 Plant Conduct of Training Procedure, Appendix B
- EUO MAA Access Self-Study Guide, Module 14711 of March 9, 1998
- EUO MAA Access Lesson Plan of 12/30/97
- EUO 9211/9215 Continuing Training Schedules of April-May 1998 (series)
- Example and Excerpted TMS Status Reports and Printouts
- EUO Training Implementation Matrix status report of March 9, 1998
- EUO Training and Qualification (T&Q) Implementation Plan and Assessment Schedule (series) with updates
- ESAMS Issue Response Report for EUO for the status of EUO related Training items of March - May 1998 (series)
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- EUO PBR Qualification and Process Assignments requirements, EUO-Y/MA-7278 excerpts
- EUO OJT Job Performance Aid (JPA)/Performance Demonstration Checklist (PDC), and OJT Evaluation Sheet for EUO Operators (series)
- EUO Building 9212 Qualification Book
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<u>Interviews Conducted:</u>

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- DOE YSO Training Manager
- EUO Training Manager
- EUO Assistant Training Manager
- EUO Training Lead
- EUO Training Assistants and Instructors (5)
- EUO On-The-Job (OJT) Training Instructors (5)
- EUO OJT and Training Coordinator (2)
- EUO General Training and Support Assistant
- Y-12 RadCon Training Manager
- Y-12 FMO Training Manager
- Y-12 Nuclear Criticality Safety Training Manager
- Y-12 Fire Department Training Manager
- Y-12 Plant Shift Superintendent Training Manager
- Y-12 Production and Certification Training Manager

ORR ASSESSMENT FORM 1
Training

- Y-12 Engineering Support Training Manager
- Y-12 Technical Training Assistant
- Y-12 Training Records Coordinator
- EUO Training Records Coordinator
- EUO Training Scheduler and Registrar
- EUO Facility Assistant
- YSO Facility Representative (FR)
- EUO Operations Manager
- EUO Shift Operations Managers (SOM) (2)
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Shift Performance Evolution:

- EUO Facility Entrance Familiarization Overview Training
- EUO Routine, Daily Operations in preparation for Phase A
- EUO Classroom Training (2)
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- EUO Drills/Off-Normal Event Drills (2)
- EUO Example/Simulated Phase A Handling and Operations Evolutions
- Y-12 Classroom Session
- EUO Demonstration of Training Management System (TMS)
- Tour of EUO and Y-12 Training Facilities, including the Y-12 Center for Continuing Education (CCE)
- Observation of Y-12 RadWorker II Practical Demonstration Training Walkthrough
- EUO Process Training Walkdown with EUO Training Instructors (2)

Discussion of Results:

Record Review: The review of the existing EUO operations and maintenance lesson plans indicated that they adequately incorporated safety requirements, technical requirements, and procedure compliance.

The review of trainee feedback forms, training evaluations of lessons learned from operating experiences, and training program reviews indicated that they are adequately addressed as part of the continuing training.

The drill program was assessed by the Operations Area (OP) of this ORR and is reported in that section of this report.

ORR ASSESSMENT FORM 1
Training

The EUO organization has a systematic analysis of job requirements to provide reasonable assurance that tasks that are essential to safe and efficient operation are addressed by the training program. DOE and other appropriate training guidelines are used as a guide for selecting, sequencing, and verifying training program structure and content.

Likewise, the EUO subject matter experts, line management, and training staff develop and maintain valid facility-specific task lists as the basis for the training program, although some of these are recently being updated as a result of corrective actions for the YSO and LMES ORR assessments completed in April 1998. These are not yet completed.

However, the changes to procedures have not always been consistently routed through the EUO process to ensure that they are included in changes to training and qualification. The review of the processes used to evaluate changes to operations and maintenance personnel training needs have not always been consistently implemented. This was an identified deficiency during the recently completed LMES ORR.

On-the-job training (OJT) and hands-on evaluations for operations and maintenance personnel are used to reinforce EUO classroom activities. The problems with OJT are discussed within the report of Training Objectives TR.1 and TR.2, and in the Maintenance (MT) area of this report.

Examinations (both written and oral), and performance evaluations are based on learning objectives, which are reviewed by Subject Matter Experts (SME), are changed frequently enough to avoid compromise, and they are adequately controlled.

Interviews: Interviews of training personnel responsible for continuing training, and implementation indicated that they adequately execute their responsibilities for establishing training needs for operations and maintenance personnel to meet this Training Objective. These interviews included discussions on: classroom training, qualification processes, and the training program. These interviews indicated that the EUO training personnel can adequately support training.

Shift Performance: Observation of operator and maintenance personnel response to operations and drills indicated that the continuing training programs are adequate to support these requirements.

Conclusion: The criteria for this objective have been met.

ORR ASSESSMENT FORM 1
Training

Issue(s):

- None.

Inspector: Robert Baeder	Team Leader: Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Training

FUNCTIONAL AREA: TR	OBJECTIVE 4, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: Modifications to the facility have been reviewed for potential impacts on training and qualification. Procedures have been revised to reflect these modifications and training has been performed to these revised procedures. (**CORE REQUIREMENT #18**)

Criteria
Qualification programs are based on the latest modifications to the facility. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9686)

Training has been completed and documented for the latest revisions of procedures performed by operations personnel, supervisors, and shift technical advisors. (5480.20A Chapter I; S/RID FA Training and Qualification (TQ) LMES ID #9686)

Approach
Record Review: Review the process used to evaluate changes to operations and maintenance personnel training needs. Review lessons plans, and supporting examinations. Determine if lesson plans accurately reflect recent facility and/or procedure changes.

Interviews: Interview training personnel to determine their involvement with facility and/or procedure changes affecting lesson plans.

Shift Performance: Observe operations and maintenance personnel in the performance of on-the-job training. Observe classroom training or a field training activity. During observation of operations involving procedures with revisions, verify proper conduct and understanding of the procedures by the operators.

Record Review:

- Oak Ridge Y-12, Enriched Uranium Operations (EUO) Restart Program Overview of January 1998
- Y-12 Operational Overview of 1997
- EUO Orientation Overview of January 1998
- Y-12 Memorandum of Understanding (MOU) to support EUO Operations with Qualified or Certified Personnel, of September 25, 1996, with supporting Y-12 MOU series of September - December 1996, and supplements of 1997 and 1998 for Y-12 Maintenance and other Y-12 Supporting Organizations

ORR ASSESSMENT FORM 1
Training

- Y-12 EUO Product Certification Organization Training and Qualification Requirements Program Plan for EUO Resumption Efforts, Revision 0, of December 31, 1996
- Y-12 Plant Conduct of Training Procedure, Y10-027, Revision 2, of November 7, 1997 with appendixes
- Y-12 Site Conduct of Operations Manual
- Y-12 Training Implementation Matrix (TIM), Y/GA-66, of December 1996, with six subsequent revision excerpts
- Y-12 Quality Program Description, Y/QD-15, of 1996
- Y-12 Training Remediation Program, Y90-090, of 1995
- Y-12 Training Matrix of Requirements of 5480.20A S/RIDs, Y10-027 of December 1996
- Y-12 EUO Resumption, Phase A Management Self Assessment (MSA) Guideline, Y/MA-7329, of October 1997
- DOE Oak Ridge Operations Office (ORO), Y-12 Site Office Assessment and Oversight Plan for EUO Phase A, at the Y-12 Plant, of August 28, 1997
- Lockheed Martin Energy Systems, Inc. (LMES) Operational Readiness Review Plan Implementation Plan for the EUO Restart Phase A at the Oak Ridge Y-12 Plant, Y/MA-7332 of December 1997
- Y-12 Type C Investigation of the Y-12 Plant Criticality Safety Approval Infractions Event at Building 9204-2E on September 22, 1994, Y/AD-622 of October 1994 with subsequent supplements
- LMES Contract DE-AC05-84OR21400, Plan of Action (POA) for the EUO Restart 97-3011, of August 25, 1997
- DOE ORO Review of the Y-12 Plant Training Implementation Matrix (TIM), Revision 6 of February 1997
- Y-12 Training and Qualification Program Descriptions, series for Phase A, Revision 2 of October 1997 for selected positions (series)
- Y-12 Task-to-Training Matrix for selected positions, Revision 0, of January 22, 1997
- Y-12 Plant Training Organization Matrix of November 13, 1996
- Y-12 EUO Process Based Restart Qualification Areas Matrix, based on Y/MA-7278 Revision 1, of October 28, 1997
- Y-12 MSA for the Support Organizations' Training and Qualification Program of 1997
- Y-12 9404 Task Training and Qualification Plan of November 1996 with the January 1998 Status report
- Report of Results of the DOE Training Assist Team Visit of April - May 1996
- LMES Y-12 EUO Training and Qualification Program Plan for Restart, Revision 0, of August 31, 1996
- Y-12 Operational Safety Requirements for Building 9212 EUO Complex, Y/MA-7255, Revision 1 of November 1997
- Y-12 Operational Safety Requirements for the 9215 Complex EUO, Y/MA-7291, of October 1997

ORR ASSESSMENT FORM 1

Training

- LMES Report of the Corporate Operational Readiness Review (LMES ORR) for the Y-12 EUO Restart Phase A, at the Oak Ridge Y-12 Plant of 14 April 1998
- DOE ORO Y-12 Site Office Assessment of EUO Phase A1 Activities at the Y-12 Plant of April 30,1998
- EUO Training and Qualification Program Descriptions (series), dated 1996 - 1998
- EUO Student Study Guides (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Courses Lessons Plans (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Student Handouts (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO On-The-Job (OJT) guidance, (series) including EUO Handling Operations
- EUO Continuing Training Plan, dated August 1997
- EUO Organization/ Personnel Matrix Diagrams (series), dated 1997 - 1998
- EUO Phase A ORR In-brief dated May 1998 for the Status of Actions and Corrective Actions
- Selected EUO (series) reports for Training, including attendance, report of training attended and training due/overdue, and Individual Training History reports
- Y-12 Training Staff Training and Qualification Program Description dated 1996
- EUO Training Staff and Instructors Guide, undated
- Training Records (32) for Operators, Maintenance and Support Personnel, Instructors, including Non-Resident Personnel (12), with selected General Record of Qualification (GRQ) reports, and Training and Qualification Program Descriptions (TQPD) (Series; samples)
- EUO Operators, Maintenance and Support Personnel List of Qualification Status as of May 1998 (series)
- Draft changes to EUO Training Processes and Administration, as of May 1998, series, including sections for the revision of the Y-12 Plant Conduct of Training Procedure Y10-027
- DOE Order 5480.20A Compliance Package Report of Status and Action for EUO/Y-12, cross referenced to Y10-027 Y-12 Plant Conduct of Training Procedure, Appendix B
- EUO MAA Access Self-Study Guide, Module 14711 of March 9, 1998
- EUO MAA Access Lesson Plan of 12/30/97
- EUO 9211/9215 Continuing Training Schedules of April-May 1998 (series)
- Example and Excerpted TMS Status Reports and Printouts
- EUO Training Implementation Matrix status report of March 9, 1998
- EUO Training and Qualification (T&Q) Implementation Plan and Assessment Schedule (series) with updates

ORR ASSESSMENT FORM 1
Training

- ESAMS Issue Response Report for EUO for the status of EUO related Training items of March - May 1998 (series)
- EUO 9212/9215 Minimum Staffing Requirements, Y/MA-7322 excerpts
- EUO PBR Qualification and Process Assignments requirements, EUO-Y/MA-7278 excerpts
- EUO OJT Job Performance Aid (JPA)/Performance Demonstration Checklist (PDC), and OJT Evaluation Sheet for EUO Operators (series)
- EUO Building 9212 Qualification Book
- EUO Building 9215 Qualification Book

Interviews Conducted:

- Y-12 Training Manager
- DOE YSO Training Manager
- EUO Training Manager
- EUO Assistant Training Manager
- EUO Training Lead
- EUO Training Assistants and Instructors (5)
- EUO On-The-Job (OJT) Training Instructors (5)
- EUO OJT and Training Coordinator (2)
- EUO General Training and Support Assistant
- Y-12 RadCon Training Manager
- Y-12 FMO Training Manager
- Y-12 Nuclear Criticality Safety Training Manager
- Y-12 Fire Department Training Manager
- Y-12 Plant Shift Superintendent Training Manager
- Y-12 Production and Certification Training Manager
- Y-12 Engineering Support Training Manager
- Y-12 Technical Training Assistant
- Y-12 Training Records Coordinator
- EUO Training Records Coordinator
- EUO Training Scheduler and Registrar
- EUO Facility Assistant
- YSO Facility Representative (FR)
- EUO Operations Manager
- EUO Shift Operations Managers (SOM) (2)
- EUO Production Manager
- EUO Supervisors (7)
- EUO Operators, Maintenance, and Support Personnel (27)

ORR ASSESSMENT FORM 1
Training

Shift Performance Evolution:

- EUO Facility Entrance Familiarization Overview Training
- EUO Routine, Daily Operations in preparation for Phase A
- EUO Classroom Training (2)
- EUO OJT-JPA-PDC for Operators (2)
- EUO Drills/Off-Normal Event Drills (2)
- EUO Example/Simulated Phase A Handling and Operations Evolutions
- Y-12 Classroom Session
- EUO Demonstration of Training Management System (TMS)
- Tour of EUO and Y-12 Training Facilities, including the Y-12 Center for Continuing Education (CCE)
- Observation of Y-12 RadWorker II Practical Demonstration Training Walkthrough
- EUO Process Training Walkdown with EUO Training Instructors (2)

Discussion of Results:

Record Review: The review of the existing EUO processes used to evaluate changes to operations and maintenance personnel training needs have not always been consistently implemented. This was an identified deficiency during the recently completed LMES ORR.

During this ORR, the review of lessons plans, and supporting examinations indicated that they do adequately address changes due to facility and/or procedure changes, as long as the EUO Training Organization have been properly informed in accordance with the existing Y-12 and EUO processes. When that has happened the EUO Training Organization has been actively involved in the process and in ensuring that the other organization knows of the procedural change or modification, to support EUO Phase A1 operations. In some cases the EUO Training Organization has not been informed of configuration and procedure changes. This is discussed within the Configuration Management (CM), Maintenance (MT), and Operations (OP) portions of this ORR report.

The review of lessons plans, and supporting examinations also indicated that they do adequately address changes due to facility and/or procedure changes, as long as the EUO Training Organization and Operations Organization have been actively involved in the process and in ensuring that the other organization knows of the procedural change or modification.

ORR ASSESSMENT FORM 1
Training

Interviews: Interviews of EUO training personnel indicated that their involvement with facility and/or procedure changes affecting lesson plans is adequate as long as they have been informed of the procedural changes and modifications. These interviews included discussions on: classroom training, qualification processes, and the training program. These interviews indicated that the EUO training personnel can adequately support training.

Shift Performance: Observation of operations and maintenance personnel in the performance of training and operations indicated that when training was correctly informed of the configuration and procedural changes, then the correct procedures (and revisions) were used and adequately understood by those operators.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None.

Inspector: ________ Robert Baeder	Team Leader: ________ Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Training

FUNCTIONAL AREA: TR	OBJECTIVE 5, Rev. 0 DATE: May 12, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: The implementation status of DOE Order 5480.20A, and associated S/RIDs are adequate for operation. Non-compliance items have been addressed. **(CORE REQUIREMENT** #7)

Criteria
All non-compliance issues are adequately addressed by DOE approved compliance schedule approvals (CSA) or exemptions. The CSAs include an adequate technical basis and schedule for attaining compliance. (Plan for Continuing and Resuming Operations, Y/AD-623, dated October 1994. Y/AD-623, Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction)

Compensatory measures that are specified in the CSAs are adequately implemented. (Plan for Continuing and Resuming Operations, Y/AD-623, dated October 1994. Y/AD-623, Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction)

Approach
Record Review: Review the order compliance package for DOE 5480.20A and including all applicable CSAs, exemptions and compensatory measures.

Interviews: If this order is not fully implemented, interview management personnel to ensure they are aware of the non-compliance(s) and action necessary to fully implement the order requirements, and all interim compensatory measures.

Shift Performance: Where appropriate, observe the implementation of any specified compensatory measures within the facility to determine their effectiveness.

Record Review:

- Oak Ridge Y-12, Enriched Uranium Operations (EUO) Restart Program Overview of January 1998
- Y-12 Operational Overview of 1997
- EUO Orientation Overview of January 1998

ORR ASSESSMENT FORM 1
Training

- Y-12 Memorandum of Understanding (MOU) to support EUO Operations with Qualified or Certified Personnel, of September 25, 1996, with supporting Y-12 MOU series of September - December 1996, and supplements of 1997 and 1998 for Y-12 Maintenance and other Y-12 Supporting Organizations
- Y-12 EUO Product Certification Organization Training and Qualification Requirements Program Plan for EUO Resumption Efforts, Revision 0, of December 31, 1996
- Y-12 Plant Conduct of Training Procedure, Y10-027, Revision 2, of November 7, 1997 with appendixes
- Y -12 Site Conduct of Operations Manual
- Y-12 Training Implementation Matrix (TIM), Y/GA-66, of December 1996, with six subsequent revision excerpts
- Y-12 Quality Program Description, Y/QD-15, of 1996
- Y-12 Training Remediation Program, Y90-090, of 1995
- Y-12 Training Matrix of Requirements of 5480.20A S/RIDs, Y10-027 of December 1996
- Y-12 EUO Resumption, Phase A Management Self Assessment (MSA) Guideline, Y/MA-7329, of October 1997
- DOE Oak Ridge Operations Office (ORO), Y-12 Site Office Assessment and Oversight Plan for EUO Phase A, at the Y-12 Plant, of August 28, 1997
- Lockheed Martin Energy Systems, Inc. (LMES) Operational Readiness Review Plan Implementation Plan for the EUO Restart Phase A at the Oak Ridge Y-12 Plant, Y/MA-7332 of December 1997
- Y-12 Type C Investigation of the Y-12 Plant Criticality Safety Approval Infractions Event at Building 9204-2E on September 22, 1994, Y/AD-622 of October 1994 with subsequent supplements
- LMES Contract DE-AC05-84OR21400, Plan of Action (POA) for the EUO Restart 97-3011, of August 25, 1997
- DOE ORO Review of the Y-12 Plant Training Implementation Matrix (TIM), Revision 6 of February 1997
- Y-12 Training and Qualification Program Descriptions, series for Phase A, Revision 2 of October 1997 for selected positions (series)
- Y-12 Task-to-Training Matrix for selected positions, Revision 0, of January 22, 1997
- Y-12 Plant Training Organization Matrix of November 13, 1996
- Y-12 EUO Process Based Restart Qualification Areas Matrix, based on Y/MA-7278 Revision 1, of October 28, 1997
- Y-12 MSA for the Support Organizations' Training and Qualification Program of 1997
- Y-12 9404 Task Training and Qualification Plan of November 1996 with the January 1998 Status report
- Report of Results of the DOE Training Assist Team Visit of April - May 1996
- LMES Y-12 EUO Training and Qualification Program Plan for Restart, Revision 0, of August 31, 1996

ORR ASSESSMENT FORM 1
Training

- Y-12 Operational Safety Requirements for Building 9212 EUO Complex, Y/MA-7255, Revision 1 of November 1997
- Y-12 Operational Safety Requirements for the 9215 Complex EUO, Y/MA-7291, of October 1997
- LMES Report of the Corporate Operational Readiness Review (LMES ORR) for the Y-12 EUO Restart Phase A, at the Oak Ridge Y-12 Plant of 14 April 1998
- DOE ORO Y-12 Site Office Assessment of EUO Phase A1 Activities at the Y-12 Plant of April 30,1998
- EUO Training and Qualification Program Descriptions (series), dated 1996 - 1998
- EUO Student Study Guides (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Courses Lessons Plans (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO Training Student Handouts (series), including materials for EUO Safety Basis, EUO General Operators, EUO Shift Technical Advisors (STA), EUO MAA Procedures, EUO Round Sheets and Readings, EUO Machining and Handling Operations
- EUO On-The-Job (OJT) guidance, (series) including EUO Handling Operations
- EUO Continuing Training Plan, dated August 1997
- EUO Organization/ Personnel Matrix Diagrams (series), dated 1997 - 1998
- EUO Phase A ORR In-brief dated May 1998 for the Status of Actions and Corrective Actions
- Selected EUO (series) reports for Training, including attendance, report of training attended and training due/overdue, and Individual Training History reports
- Y-12 Training Staff Training and Qualification Program Description dated 1996
- EUO Training Staff and Instructors Guide, undated
- Training Records (32) for Operators, Maintenance and Support Personnel, Instructors, including Non-Resident Personnel (12), with selected General Record of Qualification (GRQ) reports, and Training and Qualification Program Descriptions (TQPD) (Series; samples)
- EUO Operators, Maintenance and Support Personnel List of Qualification Status as of May 1998 (series)
- Draft changes to EUO Training Processes and Administration, as of May 1998, series, including sections for the revision of the Y-12 Plant Conduct of Training Procedure Y10-027
- DOE Order 5480.20A Compliance Package Report of Status and Action for EUO/Y-12, cross referenced to Y10-027 Y-12 Plant Conduct of Training Procedure, Appendix B
- EUO MAA Access Self-Study Guide, Module 14711 of March 9, 1998
- EUO MAA Access Lesson Plan of 12/30/97
- EUO 9211/9215 Continuing Training Schedules of April-May 1998 (series)

ORR ASSESSMENT FORM 1
Training

- Example and Excerpted TMS Status Reports and Printouts
- EUO Training Implementation Matrix status report of March 9, 1998
- EUO Training and Qualification (T&Q) Implementation Plan and Assessment Schedule (series) with updates
- ESAMS Issue Response Report for EUO for the status of EUO related Training items of March - May 1998 (series)
- EUO 9212/9215 Minimum Staffing Requirements, Y/MA-7322 excerpts
- EUO PBR Qualification and Process Assignments requirements, EUO-Y/MA-7278 excerpts
- EUO OJT Job Performance Aid (JPA)/Performance Demonstration Checklist (PDC), and OJT Evaluation Sheet for EUO Operators (series)
- EUO Building 9212 Qualification Book
- EUO Building 9215 Qualification Book

Interviews Conducted:

- Y-12 Training Manager
- DOE YSO Training Manager
- EUO Training Manager
- EUO Assistant Training Manager
- EUO Training Lead
- EUO Training Assistants and Instructors (5)
- EUO On-The-Job (OJT) Training Instructors (5)
- EUO OJT and Training Coordinator (2)
- EUO General Training and Support Assistant
- Y-12 RadCon Training Manager
- Y-12 FMO Training Manager
- Y-12 Nuclear Criticality Safety Training Manager
- Y-12 Fire Department Training Manager
- Y-12 Plant Shift Superintendent Training Manager
- Y-12 Production and Certification Training Manager
- Y-12 Engineering Support Training Manager
- Y-12 Technical Training Assistant
- Y-12 Training Records Coordinator
- EUO Training Records Coordinator
- EUO Training Scheduler and Registrar
- EUO Facility Assistant
- YSO Facility Representative (FR)
- EUO Operations Manager
- EUO Shift Operations Managers (SOM) (2)

ORR ASSESSMENT FORM 1
Training

- EUO Production Manager
- EUO Supervisors (7)
- EUO Operators, Maintenance, and Support Personnel (27)

Shift Performance Evolution:

- EUO Facility Entrance Familiarization Overview Training
- EUO Routine, Daily Operations in preparation for Phase A
- EUO Classroom Training (2)
- EUO OJT-JPA-PDC for Operators (2)
- EUO Drills/Off-Normal Event Drills (2)
- EUO Example/Simulated Phase A Handling and Operations Evolutions
- Y-12 Classroom Session
- EUO Demonstration of Training Management System (TMS)
- Tour of EUO and Y-12 Training Facilities, including the Y-12 Center for Continuing Education (CCE)
- Observation of Y-12 RadWorker II Practical Demonstration Training Walkthrough
- EUO Process Training Walkdown with EUO Training Instructors (2)

Discussion of Results: The review of the compliance for DOE Order 5480.20A indicated that corrective actions are in progress for some previously identified (or related) deficiencies, such as those identified during the recently completed YSO Assessment, and LMES ORR. However, overall the implementation of this order and its compensatory measures is adequate for EUO.

Interviews: Interviews of EUO personnel indicated that they are adequately aware of the status of implementation of this order and their responsibilities under DOE 5480.20A.

Shift Performance: Observation of the EUO training and operations during this ORR supported the conclusion that overall the implementation of this order is adequate.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None.

Inspector: Robert Baeder	Team Leader: Jeffry L. Roberson

ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

FUNCTIONAL AREA: WM	OBJECTIVE 1, Rev. DATE: May 11, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: Waste management and environmental protection programs are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure services are adequate for safe operations. **(CORE REQUIREMENT #8)**

Criteria
The waste management and environmental protection organizations are established and functioning to support the operations organization. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented. They are adequately staffed with qualified personnel. (5400.1, Ch. III.2; S/RID FA Environment Protection (EP) LMES ID #7332-#7336)

An effective environmental protection and waste management program has been implemented that will ensure compliance with the permits associated with the Clean Air Act and Clean Water Act. Procedures have been developed to ensure that hazardous and radioactive materials and wastes are handled in accordance with legislative requirements and DOE orders. (5400.1, para 9.f.7; 5820.2A, para 8.j)

Approach
Record Review: Review the documentation (e.g., administrative procedures, organizational charts, position descriptions, or internal memorandums) which establish the roles, responsibilities, interfaces, and staffing levels for the waste management and environmental protection organization. Review all environmental permits that have been issued for EUO Phase A operations and verify that the permit requirements have been implemented. Review the necessary records and program procedures to ensure that hazardous and radioactive wastes are handled in accordance with appropriate legislative requirements (e.g. NOVs, NODs, FFCA, etc. and other state regulations), the EA/EIS, and DOE orders.

Interviews: Interview those Environmental Protection/Waste Management personnel that support operations to determine if they are familiar with their roles, responsibilities, and interfaces with the operations organization.

Shift Performance: While observing evolutions and drill response, determine if Environmental Protection/Waste Management personnel are providing adequate support to the operations organization, and attention is given to health, safety and environmental protection issues.

ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

Record Review:

- Y-70-909, Dike Management
- Y/MN 7329, Enriched Uranium Operation (EUO) Phase A Management Self-Assessment Guidelines
- Y-70-921, Environmental Officer Program
- WMP Y/EN 5632, Project Waste Management Plan
- CSR-HC-041, High Capacity Evaporator
- Y70-903, Transfer of Waste to Y-12 ESWMO
- Y70-932, Resource Conservation and Recovery Act
- ES/ESH-73, Oak Ridge Reservation Annual Site Environmental Report for 1996, October 1997
- Y/MA-7254, The Basis for Interim Operation for Building 9212 EUO Operations Complex, Rev. 1, August 1997
- Y/MA-7290, The Basis for Interim Operation for the 9215 Complex Enriched Uranium Operations, October 1997, Rev. 0
- Y/MA-7291, The Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, October 1997
- Y/MA 7255, The Operational Safety Requirements for Building 9212 Enriched Uranium Operations Complex, November 1997
- Y 50-37-036, Generic Wet Vacuum Trap Normal Operations
- Y/TS 896, Y-12 Plant Enriched Uranium Recovery RCRA Regulatory Compliance Plan
- Y/MA-7200, RCRA Waste Minimization Initiative Progress Report for the Enriched Uranium Operations/Metal Preparation (EUO/MP) Division, September 1992
- Y 70-300, Authorization Basis Implementation Administrative Controls: Radioactive and Hazardous Waste Management Program
- Y/ES-241, Uranium Economic Disposition Methodology, T. C. Myhre, September 1997
- Y/ES-162, Surplus Highly Enriched Uranium Disposition Program Plan, October 1996
- Y/Sub/WM-248, Y-12 Waste Generating Organization Pollution Prevention Program Implementation Plan for the EUO, July 1995
- TNHW-084, RCRA Part B Permit for the Production Associated Units at the Oak Ridge Y-12 Plant, September 1995

Interviews Conducted:

- LMES Environmental Team (4)
- 9212 Chemical Operator (2)
- 9212 Supervisors (2)
- 9212 Production Manager
- Manager, Nuclear Materials Management and Storage Program

ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

- Air Sources (Environmental Compliance Organization) (2)
- Manager, EUO
- CSMO Manager, Y-12
- Environmental Officer (2)
- Operations Manager, Building 9212
- EUO Nuclear Chemist
- NDA Technican
- RCRA Story as Associated to Building 9212 Operations
- RCRA Waste Streams/Pollution Prevention Activities

Shift Performance Evolution:

- Pre-job brief for Solution Transfer to 9818 F-604 Tank
- Solution Transfer to 9818 F-604 Tank
- Pre-job brief for Solution Receiving/Evaporator/B-1 Lab Evolution
- Solution Receiving (Bottle Rocking/Sampling)
- Verification of Evaporator Prerequisites
- Solution Pour-up to Evaporator Feed Tanks
- Evaporator Operation

Discussion of Results:

The review verified that the programs are well established and that the personnel are adequately trained and knowledgeable to fulfill their responsibilities. Compliance with environmental requirements has been maintained throughout the stand-down of operations without any violations. The resumption of EUO activities should result in no significant impact on the regulatory compliance status. Building 9212 is a permitted RCRA unit and possesses a RCRA Part B Permit (TNHW-084) issued by the State of Tennessee.

Training requirements for operations are incorporated in the environmental permits and is standard within EUO. Interviews with operators and supervisors showed that they possess adequate knowledge to carry out the support activities for the EUO.

A walkdown of waste storage areas in Buildings 9212 and 9215 indicated that adequate facilities and equipment are available to ensure services are in place for safe operations. Galvanized tin cans and polyethylene bottles are adequately stored in criticality safe steel racks and storage shelves.

Data concerning air emissions from the EUO facilities were reviewed relative to air emission permits and associated regulations derived from the Clean Air Act of 1990. The results were in compliance with requirements. Similarly, water discharges from the EUO comply with water discharge permits and associated regulations in accordance with the Clean Water Act.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None.

Inspector: Ray Cooperstein	Team Leader: Jeffrey L. Roberson

ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

FUNCTIONAL AREA: WM	OBJECTIVE 2, Rev. DATE: May 11, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: Level of knowledge of operations and operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of operating and operations support personnel. **(CORE REQUIREMENT #3)**

Criteria
Waste management and environmental support personnel demonstrate the ability to carry out normal, abnormal, and emergency procedures under their cognizance. (5480.20A, Ch. I; 5480.19, Ch. XVI; S/RID FA Training and Qualification (TQ) LMES ID #9729, FA Management Systems/Technical Procedures (MS/TP) LMES ID #5904, #5905, #2777, #5908, #5918, #6026, #6754-#6771)

Waste management and environmental support personnel demonstrate a working knowledge of facility systems and components related to safety. These personnel also give adequate attention to health, safety and environmental protection issues. (5480.20A, Ch. I; 5480.19, Ch. VIII; 10 CFR 830.120; 5700.6C, Criteria II; S/RID FA Training and Qualification (TQ) LMES ID #9729, #1365)

Approach
Record Review: Review for adequacy and completion, the training records which indicate waste management and environmental support personnel training on facility procedures and systems under their cognizance as well as system and facility hazards.

Interviews: Interview selected waste management and environmental support personnel to assess their understanding of actions when responding to abnormal and emergency conditions and facility hazards as well as their understanding of how these actions relate to the safety basis for operations. Determine if these personnel have an adequate knowledge of health, safety, and environmental protection issues.

Shift Performance: Observe drills, routine evolutions and normal operations, to assess the ability of waste management and environmental support personnel to safely operate systems and components in accordance with approved plant procedures.

ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

Record Review:

- Y-70-909, Dike Management
- Y/MN 7329, Enriched Uranium Operation (EUO) Phase A Management Self-Assessment Guidelines
- Y-70-921, Environmental Officer Program
- WMP Y/EN 5632, Project Waste Management Plan
- CSR-HC-041, High Capacity Evaporator
- Y70-903, Transfer of Waste to Y-12 ESWMO
- Y70-932, Resource Conservation and Recovery Act
- ES/ESH-73, Oak Ridge Reservation Annual Site Environmental Report for 1996, October 1997
- Y/MA-7254, The Basis for Interim Operation for Building 9212 EUO Operations Complex, Rev. 1, August 1997
- Y/MA-7290, The Basis for Interim Operation for the 9215 Complex Enriched Uranium Operations, October 1997, Rev. 0
- Y/MA-7291, The Operational Safety Requirements for the 9215 Complex Enriched Uranium Operations, October 1997
- Y/MA 7255, The Operational Safety Requirements for Building 9212 Enriched Uranium Operations Complex, November 1997
- Y 50-37-036, Generic Wet Vacuum Trap Normal Operations
- Y/TS 896, Y-12 Plant Enriched Uranium Recovery RCRA Regulatory Compliance Plan
- Y/MA-7200, RCRA Waste Minimization Initiative Progress Report for the Enriched Uranium Operations/Metal Preparation (EUO/MP) Division, September 1992
- Y 70-300, Authorization Basis Implementation Administrative Controls: Radioactive and Hazardous Waste Management Program
- Y/ES-241, Uranium Economic Disposition Methodology, T. C. Myhre, September 1997
- Y/ES-162, Surplus Highly Enriched Uranium Disposition Program Plan, October 1996
- Y/Sub/WM-248, Y-12 Waste Generating Organization Pollution Prevention Program Implementation Plan for the EUO, July 1995
- TNHW-084, RCRA Part B Permit for the Production Associated Units at the Oak Ridge Y-12 Plant, September 1995

Interviews Conducted:

- LMES Environmental Team (4)
- 9212 Chemical Operator (2)
- 9212 Supervisors (2)
- 9212 Production Manager
- Manager, Nuclear Materials Management and Storage Program
- Air Sources (Environmental Compliance Organization) (2)

ORR ASSESSMENT FORM 1

Waste Management and Environmental Protection

- Manager, EUO
- Environmental Officer (2)
- Operations Manager, Building 9212
- EUO Nuclear Chemist
- NDA Technician
- RCRA Story as Associated to Building 9212 Operations
- RCRA Waste Streams/Pollution Prevention Activities

Shift Performance Evolution:

- Pre-job brief for Solution Transfer to 9818 F-604 Tank
- Solution Transfer to 9818 F-604 Tank
- Pre-job brief for Solution Receiving/Evaporator/B-1 Lab Evolution
- Solution Receiving (Bottle Rocking/Sampling)
- Verification of Evaporator Prerequisites
- Solution Pour-up to Evaporator Feed Tanks
- Evaporator Operation

Discussion of Results:

Based upon interviews, walkdowns, evolutions and records concerning the operators' activities, it is concluded that the knowledge of operations and operations support personnel is adequate for EUO Phase A1 startup.

Although training records were not reviewed in detail, random reviews with waste management personnel interviewed indicated that they possessed adequate knowledge of the operations. The staff are well experienced in EUO Waste Management activities.

Reports, records, and logs support this as exemplified by employee training histories of persons interviewed. Compliance Training is required on an annual basis.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None.

Inspector: Ray Cooperstein	Team Leader: Jeffrey L. Roberson

ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

FUNCTIONAL AREA: WM	OBJECTIVE 3, Rev. DATE: May 11, 1998	CRITERIA MET	
		YES X	NO

OBJECTIVE: The implementation status of DOE Orders 5400.1, 5400.5, 5480.4 and associated S/RIDs are adequate for operations. Non-compliance issues have been addressed. **(CORE REQUIREMENT #7)**

Criteria
All non-compliance issues are adequately addressed by DOE approved CSAs or exemptions. The CSAs include an adequate technical basis and schedule for attaining compliance. Plan for Continuing and Resuming Operations, Y/AD-623, dated October 1994. Y/AD-623, Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction)

Compensatory measures that are specified in the CSAs are adequately implemented. Plan for Continuing and Resuming Operations, Y/AD-623, dated October 1994. Y/AD-623, Standards/Requirements Implementation Assessment Instruction, Standards/Requirements Identification Document Development and Approval Instruction)

Approach
Record Review: Review order compliance packages for the listed orders and associated standards including all applicable CSAs, exemptions, and compensatory measures.

Interviews: If these orders are not fully implemented, interview management personnel to ensure they are aware of the non-compliance(s) and action necessary to fully implement the order requirements, as well as any interim compensatory measures.

Shift Performance: Where appropriate, observe the implementation of any specified compensatory measures within the facility to determine their effectiveness.

Record Review:

- Y-70-909, Dike Management
- Y/MN 7329, Enriched Uranium Operation (EUO) Phase A Management Self-Assessment Guidelines
- Y-70-921, Environmental Officer Program
- WMP Y/EN 5632, Project Waste Management Plan
- CSR-HC-041, High Capacity Evaporator
- Y70-903, Transfer of Waste to Y-12 ESWMO

- Y70-932, Resource Conservation and Recovery Act
- ES/ESH-73, Oak Ridge Reservation Annual Site Environmental Report for 1996, October 1997
- Y/MA-7254, The Basis for Interim Operation for Building 9212 EUO Operations Complex, Rev. 1, August 1997
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- Air Sources (Environmental Compliance Organization) (2)
- Manager, EUO
- CSMO Manager, Y-12
- Environmental Officer (2)
- Operations Manager, Building 9212
- EUO Chemist
- NDA Technician
- RCRA Story as Associated to Building 9212 Operations
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ORR ASSESSMENT FORM 1
Waste Management and Environmental Protection

Shift Performance Evolution:

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Discussion of Results:

The EUO processes generate various types of waste that must be handled appropriately. The waste may be radioactive, hazardous or a combination thereof (mixed).

The S/RIDs that are applicable to EUO in the waste management and environmental protection functional area essentially follow the requirements of applicable laws, regulations and permits. An exception is the DOE Order 5480.2A which, inter alia, addresses low-level and mixed wastes management. Verification of compliance with the Order was performed along with the verifications of the non-nuclear S/RIDs. The YSO assesses the compliance with RCRA/CERCLA requirements on an as-needed basis while the LMES Environmental Compliance Organization performs an annual assessment.

Interviews and evolutions indicated that the operating and support operations personnel have adequate knowledge and understanding concerning the nature of the waste streams, and the necessary preparations (control, handling and transfer of waste) for their subsequent management. The only safety commitments identified as specific controls in Phase A of the EUO restart deal with discard limits on fissile material and double sampling of uranium-bearing solutions leaving MAAs for criticality purposes. The other elements of the waste management program are either RCRA or DOE Order 5820.2A related requirements.

Since a primary mission of the Y-12 Plant is the recovery of uranium-235 and the central scrap management office for unirradiated uranium (CSMO) is also associated with the EUO, interviews with CSMO personnel were also held to establish its relationship with the EUO and the waste management program. Both programs are integrated to effect recovery of enriched uranium for strategic and economic reasons. CSMO has been operating (receiving scrap enriched materials from off site customers within the DOE complex) during the stand-down for storage and ultimate recovery of fissile material.

The EUO Pollution Prevention Program is actively incorporated in the site-wide plan. Y-12 has established goals for the waste categories and subcategories, as well as for reducing releases of hazardous materials to the environmental and reducing hazardous materials usage.

No deficiencies or findings were found with respect to this objective.

Conclusion: The criteria for this objective have been met.

Issue(s):

- None.

Inspector: R. Cooperstein Ray Cooperstein	Team Leader: Jeffrey L. Roberson Jeffrey L. Roberson