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**U.S. DEPARTMENT OF ENERGY  
OAK RIDGE OPERATIONS**

**Y-12 SITE OFFICE RESTART TEAM**

**ASSESSMENT OF THE  
DEPLETED URANIUM OPERATIONS  
AND SUPPORT FUNCTIONS AT THE  
Y-12 PLANT**

**SEPTEMBER 26, 1995**

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AT THE Y-12 PLANT**

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## **EXECUTIVE SUMMARY**

The Depleted Uranium Operations (DUO) at the Y-12 Plant was suspended by the Management and Operating Contractor on September 22, 1994. In accordance with *Department of Energy (DOE) Order 5480.31, Startup and Restart of Nuclear Facilities*, the resumption authority for DUO was delegated to the contractor (Lockheed Martin Energy Systems, Inc. [LMES]) management by the Manager of DOE Oak Ridge Operations Office. The delegation of restart authority to LMES was contingent upon DOE YSO line management concurrence in the LMES resumption authorization. LMES management conducted self-assessment activities and a formal LMES Independent Readiness Assessment (IRA) to evaluate their state of readiness to resume operations. The Y-12 Site Office Restart Team (YSORT) provided the Y-12 Site Office (YSO) line management oversight of the LMES activities to support DOE management's decision to concur with the LMES restart authorization as detailed in this report.

The YSORT conducted work observations, interviews, and document reviews of LMES activities in four organizations at the Y-12 Plant (Depleted Uranium [DU] Organization, Disassembly and Storage [DSO], Quality Organization [QO], and Waste Management [WM]) germane to the resumption of the Depleted Uranium Operations (DUO) mission activities from July 24, 1995, through September 22, 1995. YSORT consisted of about twenty full-time professional and administrative staff members with diverse nuclear backgrounds. The assessments were planned and performed in accordance with the Y-12 Site Office Restart Team Assessment Plan for Depleted Uranium Operations and consistent with DOE Order 5480.31 and the resumption scope defined by the DOE approved Y/NA-1800C, "LMES Readiness Assessment Plan of Action for the Resumption of Depleted Uranium Operations and Support Functions at the Oak Ridge Y-12 Plant."

The facilities and processes within the scope of the LMES DUO Plan of Action (POA) were not all scheduled for immediate operation upon resumption. As such, LMES adopted a strategy in the POA to verify the readiness of the basic programs and staff to support DUO resumption in the LMES IRA. Low-hazard facilities and processes, such as arc melting and casting, will only be restarted when they are needed to support mission activities. LMES plans to control the restart of the low-hazard facilities, using Restart Test Programs specifically developed for each such facility. These Restart Test Programs provide specific actions needed to complete and verify the status of facilities and equipment, applicable procedures, and personnel training and qualifications.

The YSORT and internal LMES assessments of DUO readiness found that the basic DUO programs and staff were ready, on a general basis, to support the Restart Test Programs. However, a number of performance and program problems were identified in Conduct of Operations, Training and Qualification, and Restart Test Programs content that required LMES actions prior to the implementation of Restart Test Programs (i.e., actual operations in the particular restart area).

The YSORT assessments of DUO generated 58 findings. Of these, 24 were designated pre-restart in accordance with YSO guidance as requiring resolution prior to restart. The remaining 34 findings were designated as post-restart. Of the 34 post-restart findings, 22 must be resolved prior to the restart of low-hazard facilities and have been designated as preoperational findings. All YSORT pre-restart findings have not been closed as of the date of this report. Acceptable resolution for the post-restart findings discussed in this report will be ensured through the DOE oversight of the LMES corrective action plans.

A summary of results for each assessment functional area follows:

### **Conduct of Operations**

The results of this assessment indicate that the Conduct of Operations Program was in the process of being fully developed and was not consistently implemented throughout all DUO organizations. Consequently, many implementation problems with respect to specific conduct of operations requirements were identified. None of the problems presented actual or potential significant safety risks. The long-term implementation of Conduct of Operations Program by the contractor is adequate to eliminate recurrence of these noncompliances.

### **Training and Qualification**

The review of the training and qualification of personnel that are needed to support DUO determined that such personnel were not trained and qualified consistently among the organizations involved. For example, all DSO personnel on the resumption crew were trained and qualified, none of the QO personnel have completed all of their required training, and sufficient Uranium Chip Oxidation Facility (UCOF) personnel have completed their required training to meet their minimum staffing requirements. The adequacy determination of the DUO Training and Qualification Functional Area to support resumption is based on the existence of acceptable LMES controls to ensure that only qualified personnel are assigned to work activities.

### **Procedures and Programs**

Procedures required for resumption of DUO were technically and operationally adequate. Personnel were knowledgeable of the procedures, and they exhibited knowledge of the procedure use and adherence requirements. Personnel have been provisionally qualified on the latest revisions, and measures were in place to prevent unqualified personnel from performing work.

### **Facility/System Readiness and Material Condition**

YSORT determined that the condition and status of the facilities described in the DOE-approved LMES POA are adequate to support resumption. LMES plans to complete restart activities for individual, DUO low-hazard process areas and activities using Restart Test Programs that prescribe measures for preparing personnel, equipment, and procedures for specific mission activities such as arc melting and casting. The LMES overall strategy to use the Restart Test Programs was found to be acceptable. However, problems were identified with the Restart Test Programs, including insufficient equipment scope and missing plans for Non-Destructive Examination (NDE) and Dimensional Inspection activities. LMES has established measures to resolve the above problems prior to the implementation of the individual Restart Test Programs.

### **Safety Culture**

YSORT has determined that a sufficient Safety Culture exists to support an LMES recommendation to restart DUO, provided that acceptable dispositions are confirmed for all

pre-restart findings and that the Restart Test Programs are acceptably executed.

## **Management**

Based on the results of this assessment, the activities performed by LMES were determined to be adequate in meeting the requirements defined by the assessment criteria, with the exception of the pre-restart deficiencies identified in the assessment reports. YSORT evaluated LMES IRA for the resumption of DUO. From this evaluation, YSORT concluded that the breadth, depth and results of the LMES IRA were adequate to verify the readiness of hardware, personnel, and management programs defined in the POA. The LMES IRA identified no pre-restart findings. In addition, YSORT documented several positive observations to recognize the significant improvements made in this LMES IRA for DUO over that for Receipt, Storage, and Shipment operations.

## **Conclusion**

The YSORT recommends that DOE concurrence for resumption of DUO be granted subject to the following conditions.

1. LMES resumption area management shall ensure the successful and safe implementation of Restart Test Programs for facilities and processes not immediately required for operation. LMES shall inform the YSO in writing of each restart test plan, at least, 10 working days prior to the implementation.
2. The YSO shall observe and evaluate the contractor's planning, execution of the Restart Test Program activities, closure of all post-restart preoperational findings, and initial operations to ensure the operation will be conducted in a safe manner.
3. LMES shall establish and implement effective administrative controls and compensatory measures, if any, required for the implementation of the Restart Test Programs.

YSORT also recommends that DOE provide written direction to the contractor for the implementation of the above actions. With these conditions in place, the YSORT considers that DUO will be resumed safely to meet the immediate mission needs, and, with subsequent DOE review and approvals, can proceed with the preparations for the implementation of the Restart Test Programs.

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## **1.0 INTRODUCTION**

The United States Department of Energy (DOE) established a system to standardize and control the process of facility startups in DOE Order 5480.31, Startup and Restart of Nuclear Facilities. DOE has delegated the authority to restart the Depleted Uranium Operations (DUO) to Lockheed Martin Energy Systems, Inc. (LMES), the Management and Operating Contractor, in accordance with the provisions of the above DOE Order. This delegation of authority is subject to DOE line organization's validation of the LMES state of readiness and concurrence in the contractor's authorization.

The overall framework to restart facilities at Y-12 was published in Y/AD-623, "Plan for Continuing and Resuming Operations, Oak Ridge Y-12 Plant, and was concurred by the Assistant Secretary for Defense Programs. To meet the intent of DOE Order 5480.31, the DOE Y-12 Site Office (YSO) organized and tasked a Y-12 Site Office Restart Team (YSORT) of subject matter experts to evaluate LMES readiness to resume DUO activities. Team biographical information is provided in Appendix 7.1.

The results of the YSORT assessment of DUO and the recommendations to the Y-12 Site Manager regarding LMES readiness to resume operations are documented in this report.

## **2.0 SCOPE**

The assessment in accordance with Y-12 Site Office Restart Team Assessment Plan for Depleted Uranium Operations, dated July 21, 1995, evaluated the adequacy of the actions taken by LMES to prepare DUO for restart. The YSORT Assessment Plan was based upon the scope defined in the DOE-approved Y/NA-1800C, LMES Readiness Assessment Plan of Action for the Resumption of Depleted Uranium Operations and Support Functions at the Oak Ridge Y-12 Plant, dated June 1, 1995. In general the scope of this assessment included facilities and activities involved in arc melting, casting, metal working, storage, and inspection in over a dozen buildings. The YSORT reviews were performed using the Core Objective (COB) described and scoped in the LMES DUO Plan of Action (POA). These reviews were organized into the following six functional areas of DUO.

- Conduct of Operations and Level of Knowledge
- Training and Qualification
- Procedures and Programs
- Facility/System Readiness and Material Condition
- Safety Culture
- Management

The YSORT assessment activities were conducted and documented in accordance with YSO Operating Procedure YSO 5.4-1, "Restart Team Assessments."

## **3.0 REFERENCES**

A complete list of references are shown in Appendix 7.4.

## **4.0 ASSESSMENT RESULTS AND OVERALL CONCLUSION**

The facilities and processes within the scope of the LMES DUO POA were not all scheduled



for immediate operation upon resumption. Limited operations were planned for late calendar year (CY) 1995, and the CY 1996 activity will be based on emerging mission work. As a result of the uncertainties regarding specific facility and activity production restarts, the LMES employed a strategy in the POA whereby the basic DUO programs and staff would be verified as ready to support DUO resumption at the time of the LMES Independent Readiness Assessment (IRA). However, individual low-hazard facilities and processes, such as arc melting, casting, etc., would not be individually restarted until needed in support of mission activities. These individual restarts were to be controlled by low-hazard process Restart Test Programs as discussed in Section 5.4.

The Restart Test Programs for individual activities provide specific actions needed to complete and verify the status of facilities and equipment, applicable procedures, and personnel training and qualifications. Successful completion of the Restart Test Program activities require a sound conduct of operations foundation. The YSORT and internal LMES assessments of DUO readiness found that the basic DUO programs and staff were ready, on a general basis, to support the Restart Test Programs. However, a number of performance and program problems were also identified that require further action in the subject areas of Conduct of Operations, Training and Qualification, and Restart Test Programs content. Consequently, the YSORT assessment findings and issues discussed below require further action by LMES prior to execution of the Restart Test Program for each individual restart activity. The post-restart findings that must be resolved prior to each individual restart activity were designated as preoperational findings. Acceptable completion of the further actions will be managed via DOE oversight of the LMES corrective action plans for the respective findings.

#### **4.1 Conduct of Operations Issues**

Conduct of Operations programmatic and implementation problems were found in organization and administration, implementation of operational controls, and implementation of radiological controls. The team found that the various conduct of operations documents inadequately defined functional roles and responsibilities, reporting relationships, the details of commitment to specific *DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities*, provisions, and applicability of the LMES Conduct of Operations Manual and LMES Y-12 Procedures as discussed in Sections 5.1 and 5.6 of this report. The YSORT found that managers and workers frequently did not have clear understanding of the program documents nor the assignment of responsibilities under the program. As a result, the potential existed for important functions to be missed or improperly executed. For example, the interface responsibilities between Depleted Uranium (DU) Organization and Radiological Control (RadCon) Management were not working effectively. As a result, DU Organization and did not receive adequate RadCon departmental leadership and support.

Although there was not a clear result of the organizational and program definition problems, LMES also experienced difficulties in implementation of specific conduct of operations activities. Sections 5.1, 5.3, and 5.5 discuss numerous examples which indicate that the implementation of Conduct of Operations Program for DUO needs improvement to ensure that the Restart Test Programs will be successful and the restart activities safety implemented. Examples include procedure changes without proper approval; unworkable procedures issued to and used in the field; and problems with round sheet implementation and supervisory review, management tours, operators aids, and temporary modifications. RadCon problems

included boundary area controls, adequacy and implementation of radiation work permit, and inappropriate postings.

## **4.2 Training Issues**

The DUO training and qualification activities for conduct of operations provided basic knowledge but was weak, relied heavily on required reading, had no student performance evaluation, and did not provide strong reinforcement of management expectations. Task training based on activity walk-throughs resulted in provisional qualifications which require final, hands-on qualification certification as part of the Restart Test Programs. Examples of weaknesses in basic personnel knowledge and the provisional qualifications included the conduct of operations implementation problems discussed above, DU Organization and QO staff training not current with DUO resumption requirements, use of inappropriate on-the-job training (OJT) evaluation techniques, and a number of individual training delinquencies. Currently, no DU Organization or QO personnel fully meet the training and qualification requirements for an individual activity restart. Although the Restart Test Programs should result in adequate task qualification, the actions taken in response to YSORT and LMES Management Self-Assessment (MSA) and IRA findings must be shown to be effective prior to execution of the Restart Test Programs to ensure that personnel performance was acceptable in their execution.

## **4.3 Reliance on Restart Test Plans for Individual Activity Readiness**

The Restart Test Programs were found to be acceptable in concept and considered them to provide appropriate levels of requirements for facility/equipment, procedure, and personnel readiness. However both DOE and LMES assessments found that the plans did not include all necessary equipment in their scope (Section 5.4) and, consequently, may not include all necessary procedures and training requirements germane to the missing equipment. Further, Restart Test Programs had not been developed for the QO Non-Destructive Examination (NDE) and Dimensional Inspection functions. Because of the heavy reliance upon these programs as the vehicle for attaining and affirming individual facility/activity readiness, YSORT considers the correction of the programs and verification of their adequacy by YSORT to be a prerequisite for their individual execution.

## **4.4 Overall Conclusion**

The YSORT recommends that DOE concurrence for resumption of DUO be granted subject to the following conditions.

1. LMES resumption area management shall ensure the successful and safe implementation of Restart Test Programs for facilities and processes not immediately required for operation. LMES shall inform the YSO in writing of each restart test plan, at least, 10 working days prior to the implementation.
2. The YSO shall observe and evaluate the contractor's planning, execution of the Restart Test Program activities, closure of all post-restart preoperational findings, and initial operations to ensure the operation will be conducted in a safe manner.

3. LMES shall establish and implement effective administrative controls and compensatory measures, if any, required for the implementation of the Restart Test Programs.

YSORT also recommends that DOE provide written direction to the contractor for the implementation of the above actions. With these conditions in place, the YSORT considers that DUO will be resumed safely to meet the immediate mission needs, and, with subsequent DOE review and approvals, can proceed with the preparations for the implementation of the Restart Test Programs.

## **5.0 FUNCTIONAL AREA REPORTS**

### **5.1 Conduct of Operations/Level of Knowledge**

The YSORT evaluated conduct of operations implementation to determine the readiness to resume DUO activities. This included the review of programs and procedures; the observation of field activities; the performance of the LMES MSA and IRA for the Operations Functional Area; and the actions taken by LMES to correct YSORT and other findings. The YSORT also evaluated the LMES staff's level of knowledge with respect to the procedures, programs, and operational activities needed to safely resume DUO activities. The level of knowledge of supervisors and operators was evaluated through surveillance of procedure walk-throughs; review of OJT; surveillance of the LMES IRA Team evaluation of level of knowledge; and interviews with operators and supervisors.

#### **5.1.1 Core Objectives Reviewed**

CO-17 required verification that the level of knowledge of operations personnel was adequate, based on reviews of examinations, examination results, selected interviews, and observation of work performance.

CO-19, which addresses the adequacy of implementation of DOE Order 5480.19, was used as the basis for the YSORT assessment. The scope of the CO-19 review was established by the POA and the YSORT Assessment Plan and addressed the following chapters in DOE Order 5480.19:

- I "Organization and Administration"
- II "Shift Routines and Operating Practices"
- V "Control of On-the-Job Training"
- VI "Investigation of Abnormal Events"
- VIII "Control of Equipment and System Status"
- XIV "Required Reading"
- XV "Timely Orders to Operators"
- XVI "Operating Procedures"
- XVII "Operator Aids"

#### **5.1.2 Condition of Contractor Programs and Procedures**

The level of knowledge demonstrated by supervisors and operators was satisfactory, based on YSORT observations of supervisory job control and operator performance during simulated operations. Additionally, when procedure deficiencies, equipment abnormalities, or unexpected occurrences were identified, the operators and supervisory staff demonstrated good level of knowledge of the response actions as required by administrative procedures. One specific problem was identified, however, during simulated operations. The method of verifying valve position was not consistent between operators and, in some cases, incorrect. Valve positions were sometimes checked visually, and one operator checked a valve that was required to be closed by opening it.

The performance-of the MSA for the Level of Knowledge Functional Area was considered to be adequate in scope and depth and consistent with the POA. The MSA team concluded that review criteria for CO-17 were met. This conclusion was independently reached by YSORT, through its reviews.

LMES had begun the development and implementation activities of the Conduct of Operations Program long before the 1994 stand down, but had not been successful in achieving the changes in plant programs or improving the safety culture. Comprehensive implementation plans for conduct of operations were not available until May 1995. As a result, the LMES Conduct of Operations Program was not fully developed and was inconsistently implemented across the Y-12 Plant organizational units. The overall status of program development and implementation, however, was considered adequate to support resumption subject to successful implementation of compensatory actions and interim corrective actions for YSORT and LMES MSA findings as discussed below.

The implementation of DOE Order 5480.19 for DUO is defined in MMES/Y-12-DOE-5480.19-CSA-147B. The YSORT assessment of the implementation of Conduct of Operations for each of the four DUO areas (DU Organization, Disassembly and Storage Organization [DSO], Quality Organization [QO], and Waste Management [WM]) was accomplished by verification of implementation of the commitments contained in the above compliance schedule agreement (CSA). For the most part, the team found that conduct of operations principles were being implemented in accordance with the CSA commitments. However, this assessment identified both, programmatic and specific implementation problems.

For most of the DUO organization, applicable Conduct of Operations requirements were contained in the Conduct of Operations Manual and were implemented, as specified in the CSA, at the manual chapter level. For DUO Storage and WM facilities, however, applicable Conduct of Operations requirements were contained in site procedures and were implemented in accordance with those procedures. It was not clear to YSORT how program requirements will be successfully implemented without the use of procedures and the associated review, approval, and revision controls of a procedure program. Furthermore, it was not clear how the Conduct of Operations Manual supersedes site procedures which remain effective. This concern had only minimal safety significance since the technical differences in the requirements established in the

Conduct of Operations Manual and those in the site procedures were not significant.

For the QO, neither the CSA nor the Conduct of Operations Manual specifies the method of implementation. To address this concern, DUO management was utilizing memoranda of understanding in an attempt to implement Conduct of Operations within the QO.

However, these memoranda do not fully envelope all Conduct of Operations requirements or affected DUO facilities. DUO management has agreed to resolve this problem after resumption, but prior to equipment operation. Resolution and correction will be managed by LMES using the Restart Test Program or similar controlled processes. Additionally, review of the Conduct of Operations Manual indicates that the determination of applicable requirements may not have taken full advantage of a graded approach which could have eliminated or reduced several of the overly restrictive or nonapplicable Conduct of Operations requirements.

Many implementation problems were identified by the MSA Team and YSORT. None of the problems presented an actual or potential significant safety risk. Corrective actions proposed for the MSA and YSORT findings have appropriately resolved the issues for resumption. In the area of organization and administration, DUO has not clearly defined the roles and responsibilities of personnel identified in the Conduct of Operations Manual, and DUO area boundaries were not clearly defined with respect to "landlord" vs. "tenant." Consequently, a clear understanding of authority, accountability, and interfaces does not exist. In the area of shift routines and operating practices, round sheets were not always adequately completed by operators nor reviewed by management. Additionally, management tours were not completed as required. In the area of control of OJT, evidence of training does not exist for all activities/processes. In the area of equipment and system status, evidence of required system status control could not be retrieved. Additionally, the required temporary modification program is lacking or nonexistent. In the areas of required reading, timely orders, and operator aids, several minor deficiencies were identified. Finally, in the area of operating procedures, deficiencies regarding the improper approval of procedure revisions were identified.

The performance of the MSA for the Conduct of Operations Functional Area was considered to be adequate in scope and depth and consistent with the POA. The MSA team concluded that review criteria for CO-19 were not met. This conclusion was based on the lack of submittal of a request for approval (RFA) for the Conduct of Operations CSA; the lack of adequate management monitoring and tours; the deficiencies in the communication of management expectations for procedure use in the QO; the absence of required radiography and dye penetrant records; and the lack of rigor and discipline in the performance of certain routine activities.

YSORT considers that the majority of these deficiencies were a result of

inconsistencies between requirements contained in the Conduct of Operations Manual and site procedures and the imposition of overly restrictive or nonapplicable Conduct of Operations requirements, as discussed above. The LMES long-term program refinements, when implemented, should eliminate recurrence of these specific implementation deficiencies.

### **5.1.3 YSORT Finding/Issue Closure**

The findings identified by YSORT in the Level of Knowledge and Conduct of Operations Functional Areas are summarized in Appendix 7.2. The specific findings and the contractor response documentation are available in the YSORT evidence files. Only one YSORT pre-restart finding was identified involving an incorrect method of verifying valve position. This finding has been closed.

### **5.1.4 Significant YSORT Restart Issues**

None.

### **5.1.5 Conclusion**

YSORT considers the Operations and Level of Knowledge Functional Areas within DUO acceptable for resumption.

## **5.2 Training and Qualification**

The YSORT assessed the status of training and qualification of DUO personnel to determine readiness to resume DUO activities. This included the review of programs and training records, the performance of the LMES MSA and IRA, and the actions taken by LMES to correct YSORT and other findings.

### **5.2.1 Core Objectives Reviewed**

Section 4, Criteria, of the YSORT Assessment Plan, requires evaluation of contractor performance in the Training and Qualification Functional Area using COs-13, -14, -18, -20 and -23. Specifically,

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

CO-14 verified the technical qualifications of contractor personnel responsible for facility operations were adequate.

Criterion 18.4 verified training and qualifications records reflect that the designated minimum staff has satisfactorily completed training required to support safe operations.

Criterion 20.5 verified operations personnel receive training on safety and

environmental protection requirements.

CO-23 verified the management qualifications of contractor personnel responsible for facility operations were adequate.

This section documents the details of the YSORT assessment using the above criteria. Nine findings and nine observations were identified during the review. Two of the findings were classified as pre-restart findings and seven were classified as post-restart findings.

### **5.2.2 Condition of Contractor Programs and Procedures**

The staffing for the DUO mission area includes personnel from DU Organization, DSO, QO, and the Uranium Chip Oxidation Facility (UCOF). The training programs and the personnel training status for each of these organizations were assessed during the DUO Training and Qualification Functional Area review.

The training program within DU Organization was being managed on a graded approach based on the hazards classification of their operations. DUO only has low hazards and generally accepted hazards operations. For low-hazards operations, DU Organization has established minimum staffing requirements and requires Performance Documentation Checklist (PDC) evaluations of operators who implement Class 2 procedures. The training provided for generally accepted hazards was through informal OJT. This approach was explained in the POA.

At the time of this assessment, Y-12 was implementing the requirements of *DOE Order 5480.20, Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*, through their Y-12 Plant Training Implementation Matrix for DOE Order 5480.20 (TIM). The training programs were assessed using the scheduled deliverables in the TIM as a basis to determine readiness for resumption. DUO had no deliverables due at the time of this assessment and, therefore, was in compliance with the TIM; DSO had deliverables due and was not on schedule for some of them; the QO has deliverables due and was not on schedule for most of them; and the UCOF was not included under the TIM because it was not classified as a nuclear facility.

Training was primarily provided to DU Organization operating personnel through the Center for Continuing Education organization and by OJT trainers within the DU Organization. As such, there is no separate DU Training Organization.

One of the future TIM deliverables is the development and implementation of the training and qualification program for DU Organization operating personnel. Since the qualification program was not due and has not been developed, DU Organization established a matrix of resumption training requirements for personnel in all the DU Organization positions. The YSORT review determined that none of the training of the DU Organization personnel on the resumption crew was current with the training requirements matrix and that the DU Organization Manager does not intend for them to meet all requirements prior to

DUO resumption. The requirements were intended to be met following DUO resumption and prior to resuming the low-hazard operations. It was not known when any low-hazard operations will be performed following DUO resumption. The DU Organization has administrative controls to ensure the training requirements were met through their Restart Test Program for the startup of each of the low-hazard operations. The training requirements for the personnel involved in generally accepted hazards were required to be verified by the supervisor.

Training was primarily provided to DU Organization operating personnel through the Center for Continuing Education organization and by OJT trainers within the DU Organization. The safety and health training was primarily provided through classroom training by an instructor, and the task-specific training and evaluation were provided through OJT and the PDC process.

DSO was not on schedule with all of their TIM deliverables, but all of their personnel identified on the resumption crew were qualified in accordance with their program requirements. The -incomplete, overdue items include their Training Development and Administrative Guide (TDAG) and completion of the continuing training program.

The resumption training and qualification program requirements for the QO personnel on the resumption crew were not current.

Enough personnel from the UCOF were trained in accordance with the UCOF program requirements to meet minimum staffing requirements.

All DUO organizations have established minimum education and experience requirements that meet the requirements of DOE Order 5480.20. Personnel have been reviewed against this criteria to establish compliance and, where necessary, had obtained the required waiver of requirements. DOE Order 5480.20 allows a waiver of these requirements for all incumbents in position as of the date of the TIM approval, January 1995. The DUO resumption crew was composed of personnel who were incumbents as of January 1995.

The MSA team concluded that DUO failed to meet CO-13 criteria based on six findings and one observation issued by the team. Three of the findings were pre-restart items. The remaining three findings and the observation were post-restart items. The pre-restart findings were made against the QO training programs because they were not in accordance with the TIM schedule for radiographers, dimensional inspectors, and dye penetrant inspectors. These three items were now being reported as closed by QO with MSA team concurrences based on a draft change to the TIM. The post-restart findings were open. These findings identified that the dimension inspectors, radiographers, and the dye penetrant personnel were not completing required training and that the qualification cards did not adequately document the status of the required training completion. The observation identified the omission of chip oxidation personnel from the TIM. The observation has been withdrawn by the MSA team because the TIM only



covers nuclear facilities and the UCOF was not considered a nuclear facility. Based on the findings and the results contained in the MSA Report, it does not appear that the MSA team reviewed the training and qualification of the DSO personnel on the DUO resumption team. This conclusion was based on personnel interviews, the failure of the MSA to identify DSO's noncompliances with the TIM and incomplete qualification of DSO personnel, and because the MSA Report did not address the status of the DSO training and qualification. Areas in which the MSA performed reviews were considered to be adequate in depth.

### **5.2.3 YSORT Finding/Issue Closure**

The findings identified by YSORT in this functional area are summarized in Appendix 7.2. The specific findings and the contractor response documentation are available in the YSORT evidence files. Pre-restart findings were issued to obtain LMES attention to the following concerns:

- The training for the QO was not meeting the schedule specified in TIM;
- TDAG and the continuing training program for DSO was not meeting the schedule specified in TIM;
- DU Organization personnel were not trained to meet the requirements specified in the training matrix;
- The waiver for the education requirements for the DSO manager was inappropriate; and
- The conduct of operations training for five DU Organization personnel was not current.

LMES has taken sufficient action to close the above pre-restart findings or instituted acceptable compensatory actions to address the concerns in the interim.

### **5.2.4 Significant YSORT Restart Issues**

There were no training and qualification requirements established to resume the DUO mission area. Training and qualification requirements were established for each position on the DUO resumption crew that must be met prior to resuming low-hazard operations. Currently no DU Organization or QO personnel fully meet these requirements. LMES was using their startup program to ensure personnel were qualified to perform low-hazard operations and was using normal practices for making task assignments to ensure personnel were qualified to perform generally accepted hazard operations.

### **5.2.5 Conclusion**

Training and qualification of DSO and UCOF personnel are in a condition to support DUO resumption and operation. Training and qualification of DU

Organization and QO personnel were not in a condition to support DUO resumption or operation. Conclusions that the Restart Test Program is adequate under CO-28 for controlling low-hazard operations; that controls are adequately established to preclude untrained or unqualified workers from working under CO-14; and that the established minimum staffing requirements are met with available personnel under CO-18 are pre-requisites for DUO to resume normal operations.

### **5.3 Procedures and Programs**

The YSORT conducted an independent assessment of the LMES procedure activities for DUO and observed the performance of the LMES MSA and IRA activities, using the criteria specified in YSORT Assessment Plan.

#### **5.3.1 Core Objectives Reviewed**

COs- 07, -14, and -16 were used to evaluate the DUO Procedures Functional Area. All of the criteria specified in the YSORT Assessment Plan for CO-07 were used. Additionally, the criteria from CO-14 that required an evaluation of the controls to preclude untrained personnel from performing work and the CO-16 criteria that require a determination whether personnel have been trained on the latest version of procedures were also used.

CO-07 verified that there were adequate and correct procedures for operating systems and utility systems.

CO-14 verified that technical qualifications of contractor personnel responsible for facility operations were adequate.

CO-16 verified that training has been performed to the latest revision of procedures.

#### **5.3.2 Condition of Contractor Programs and Procedures**

Low-hazard process procedures have been determined to be adequate to support resumption of DUO activities. This determination was on the performance of assessment activities and the work completed by DUO personnel in upgrading the technical adequacy of the procedures since the completion of the LMES MSA. DUO personnel have been provisionally qualified on these procedures with plans in place to qualify personnel during implementation of the restart test plans.

During performance of the LMES MSA, it was identified and documented in YSORT and MSA findings that the procedures were not technically adequate to support resumption. Through proactive actions taken by DUO management, a program was established to improve the technical correctness of the procedures. This involved enlisting the assistance of one of the MSA team members to train DUO personnel on the techniques to use when reviewing, verifying, and validating procedures. As a result of this effort, DUO now has a core group of

personnel who have been trained on how to apply the required attention to detail in procedure work.

Two DUO supervisors participated with the MSA team member in the walkdown of three procedures. During these walkdowns the MSA member critiqued the DUO personnel, thus giving them immediate feedback on the methods to use when reviewing procedures. These two trained personnel then walked down the remaining low-hazard procedures with additional DUO personnel that they trained. DUO now has between four and six personnel who have been trained on how to perform a thorough review of procedures.

The reviews performed resulted in significant changes to the procedures that were subsequently verified, validated, and approved. The procedures were not issued pending additional revisions required to respond to the concerns, if any, identified during the LMES IRA. During the IRA, minor problems were identified, and the procedures were being revised to address the identified problems at the time of this report.

Document control of DUO procedures was adequately implemented through the Plant Procedures Group who perform distribution. Although this process was slightly different than that specified in Y10-189, "Document Control", the methods used by DUO and the attention given to the process by DUO personnel have resulted in having no detectable document control problems. Since the process being used deviates from that described in Y10-189, the DUO manager issued a memorandum describing the process and individual responsibilities. Directing activities through a memorandum was not considered an acceptable method, and a finding was issued to address this concern. DUO management will develop a procedure, describing the process, to be issued prior to implementation of the restart test plans. DUO personnel were knowledgeable of the process, and operators were aware of the requirement to use controlled copies of procedures for work and to ensure they have the latest version of procedures.

DUO operators were evaluated to be knowledgeable of the procedures and the document control requirements. Some deficiencies in their knowledge of the procedure use categorization and procedure change process were discovered. In particular, on two occasions procedures were revised without following the Y10-102, "Operating Procedure Development, Revision, and Control," process. These deficiencies were documented in YSORT and MSA findings. DUO management has developed a training module that will be presented to explain the procedure use categorization system and to indoctrinate all DUO personnel on the procedure process within the next two weeks. This training will be monitored by YSORT.

Personnel have been trained to the latest revision of procedures. The process for identifying and documenting training on procedure revisions was not well defined by Y10-102, and the Training Management System (TMS) does not adequately track the accomplishment of the training. DUO has resorted to a system whereby the area supervisors make the determination of the need for training and the method to be utilized. Significant changes to a procedure result in the creation of

a procedure change directive to which all personnel are qualified. A TMS module will be created for each instance of required training on a procedure change. DUO has made the system work, but programmatic changes for all nuclear operations are necessary to make the system work and be user friendly.

Controls have been established to prevent unqualified personnel from performing work. Supervisors have been directed to verify personnel are qualified before allowing work to commence. All supervisors interviewed were familiar with this policy and knew how to access the information necessary from the TMS. Evidence files provided documentation that minimum staffing requirements have been identified, and interviews with supervisors revealed they were knowledgeable of the requirements.

DUO has a great deal of procedure work on Category III procedures remaining to be completed before execution of the restart test plans. This work is underway using facility process engineers as subject matter experts and procedure writers. The effort for preparation of the low-hazard procedures and the incorporation of lessons learned by management are assisting LMES in successfully completing this procedure work.

### **5.3.3 YSORT Finding/Issue Closure**

The findings identified by YSORT in this functional area are summarized in Appendix 7.2. The specific findings and the contractor response documentation are available in the YSORT evidence files. Pre-restart findings were issued to address the following concerns:

- The categorization for use of a low-hazard process procedure was potentially incorrect;
- The low-hazard process procedures were not always technically adequate; and
- A procedure was changed after it was formally approved.

All of the above pre-restart issues were satisfactorily closed, or LMES has instituted effective compensatory measures to address the concerns in the interim.

### **5.3.4 Significant YSORT Restart Issues**

There were no significant restart issues in the Procedures Functional Area. Completion of the training of DUO personnel on the procedure process (Y10-102) was adequate to resolve the remaining findings and to prepare DUO personnel to respond to real work conditions.

### **5.3.5 Conclusion**

Procedures to support the resumption of DUO were technically adequate for

operating the low-hazard processes. The response of DUO management in resolving earlier concerns over the quality of these procedures has been exemplary, and management accepted the problem and immediately understood and corrected the deficiencies. In addition, they had the foresight to determine and implement measures to preclude repetition of the identified problems.

#### **5.4 Facility/System Readiness and Material Condition**

YSORT evaluated the scope and content of the LMES Restart Test Programs for DUO, using the criteria specified in the YSORT Assessment Plan. This evaluation included independent reviews of the program and procedures, comparison of field conditions and procedures with the program documents, and observation of related activities of the LMES IRA Team. The IRA Team evaluated three of the eight DUO Restart Test Programs areas including the simulation of applicable procedures: casting furnaces in Building 9998, Lectromelt furnace in Building 92015 and gold recovery using potassium cyanide in Building 9201-5N. YSORT independently reviewed the programs and procedures in these three areas and observed IRA Team assessments.

##### **5.4.1 Core Objectives Reviewed**

CO-18 required verification that there were sufficient numbers of qualified personnel to support safe operations.

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

##### **5.4.2 Condition of Contractor Programs and Procedures**

The general strategy chosen by LMES for the Restart Test Programs appears adequate to support the individual area restarts. The programs provide specific actions needed to complete and verify the status of facilities and equipment, applicable procedures, and personnel training and qualifications. However, the LMES IRA Team had adverse findings in all three restart program areas evaluated with respect to the programs, procedures, and simulations. Additionally, YSORT had nine adverse findings, two of which identified absence of Restart Test Programs. Additionally, two observations highlighted the work to be completed prior to operations. These results indicate that similar deficiencies potentially exist in the remaining five Restart Test Program areas. Therefore, additional LMES actions were warranted to determine the adequacy of the Restart Test Programs in these areas.

A Restart Test Program has not been developed for the NDE area to address the calibration, startup, and other aspects of equipment readiness such as the lower voltage radiographic equipment and testing of radiography support systems such as interlocking alarms. Similarly, a Restart Test Program has not been developed for the Dimensional Measurement area, including the calibration, maintenance,

and other aspects of devices and equipment.

Observation of Procedure Y50-24-18-143, "Operation of 3N, 4N, 5N, and 6N Casting Furnaces," simulation, interviews and independent walkdowns found that the DUO Restart Test Program for the casting furnaces 3-N, 4N, 5N, and 6N does not include all support equipment for operations. Support equipment required to operate the furnaces that were not identified in the Restart Test Program include power supplies, house vacuum system, furnace vacuum pumps, furnace ram hydraulic systems and elevator. While the Restart Test Program identifies components in a system, it does not include the system. The service water system was an example of this. The IRA Team identified these deficiencies concurrently with this assessment. A YSORT-identified specific example of support equipment which was required to operate the furnaces, and omitted from the plan, was the MKS power supply readouts on each furnace control panel for furnace vacuum header pressure. These readouts were installed in 1982 and have never been included in the calibration recall program. Additionally, a management decision was made not to maintain required calibrations current. Many other devices were also observed to be in need of calibration. LMES actions were required to ensure operability and reliability of these devices prior to operations.

Observation of Procedure Y50-24-81-005 simulation, interviews, and independent walkdowns demonstrated that the DUO Restart Test Program for the 10-inch Lectromelt VAR Furnace does not include all support equipment for operations. Support equipment required to operate the arc melter, that was not identified in the Restart Test Program, includes power supplies, acid transfer system, crucible rebuild facility, crucible cleaning facility, and new crucible argon drying system. While the Restart Test Program identifies components in a system, it does not include the system itself. The service water system was an example in this regard. The IRA Team identified these deficiencies concurrently with this assessment.

YSORT-identified specific example of noninclusion of a support equipment, which was required to operate the arc melter, was the Pressure Gauge HS/L-PI-0101 (mounted on the hydraulic pump located beneath the stairs). There was no calibration sticker on this gauge, and it appears that it was never included in the calibration recall program. Procedure Y50-24-81-005, paragraph VII.D.8, instructs the operator to verify the pressure indication on this gauge, but the gauge was not listed in the Restart Test Program. Similarly, there were no calibration stickers on the two hydraulic valve operators (located about 12 feet above floor level to the left behind the pump). Many other devices were also observed to be in need of calibration. LMES attention was required to ensure operability and reliability of these devices prior to operations.

Interviews and independent walkdowns of Procedure Y50-24-33-001 demonstrated that the DUO Restart Test Program for gold recovery does not include all support equipment operations. Support equipment required to operate the F-5700-9 solution tank that were not identified in the Restart Test Program include DC power supplies, heater and controls, circulating pump and filter, and the process scale. One specific example of noninclusion of support equipment

identified by YSORT was the velometers installed at the face of each of two hoods. These devices were not included in the calibration recall program. A portable anemometer was listed in the Restart Test Program and required to be calibrated. However, this device was not mentioned in the operating procedure, but the velometers were included. It was not clear to which instrument(s) the procedure paragraphs apply. Similarly, a dial thermometer was used to ensure the correct temperature of the water prior to adding potassium cyanide. The operating procedure does not require verification of the thermometer calibration, and the Restart Test Program does not list such a device. Also noted was that fire system small bore piping appeared to penetrate the tops of exhaust ducts that were near the ceiling. During a discussion, the fire captain stated that this portion of the fire system was being inspected and tested on a routine basis. However, the DUO staff was unaware of such system testing.

Matrices have been developed by the UCOF for calibration, maintenance, and other related activities. These management tools were used to prioritize, schedule, and track work activities. Equipment status and temporary modification information were also included in the matrices. The management approach to readiness for resumption was to maintain calibrations current. Selected gauges were examined and their calibration stickers indicated they were within the established cycle. The appearance and condition of equipment, including housekeeping, were acceptable.

Review of records, including evidence files, indicated that selected facilities have identified their minimum staffing needs, including required qualifications and training. DUO has implemented a provisional qualification policy, as discussed in Section 5.2, but has not fully trained all individuals on the minimum staffing lists.

The computerized maintenance database, COMPASS, was discussed with cognizant personnel for a better understanding of the process. A maintenance job request (MJR) is generated for each identified task, including every tag that was issued to describe the problem, maintenance, etc. A hard copy of the MJR is forwarded to the maintenance group who processes the request, schedules the work, and enters the information into COMPASS. An MJR may also be generated in COMPASS by the requestor. The MJRs remain in COMPASS until the work is completed. The backlog of MJRs and estimated man-hours needed to complete the work can also be determined from COMPASS data. Work was being prioritized with respect to DUO resumption and restart of equipment. Weekly meetings were held among cognizant personnel to discuss maintenance backlog, priorities, and schedule. However, the system lacks a method to readily determine work backlog and human resources allocation as discussed in YSORT Assessment No. YSORT95-02165.

During a walkdown of Building 9998, unidentified wire leads/jumpers were found in the casting furnace area draped over a railing at the top of furnace 4N and extending down to floor level where these were wrapped around a pipe. The physical condition suggested that these were in place for an extended period. Workers were unable to identify the purpose or the owners of the leads. The presence of these wires demonstrated a lack of administrative control of status of

equipment and possibly the existence of a temporary modification. An administrative procedure was in place that addresses the control of temporary modifications. However, a YSORT observation highlights the need for periodic briefing or refresher training in the above administrative procedure for the DUO and support staff to emphasize the control of temporary modifications and other aspects covered by this procedure.

#### **5.4.3 YSORT Finding/Issue Closure**

The closure of YSORT pre-restart findings and the development of acceptable corrective action plans for preoperational findings will be adequate to support DUO resumption.

#### **5.4.4 Significant YSORT Restart Issues**

There were no significant restart issues in this functional area.

#### **5.4.5 Conclusion**

DUO was ready for resumption of operations subject to the resolution and/or correction of the identified pre operational deficiencies.

### **5.5 Safety Culture**

As stated in the LMES POA, there were no ongoing funded missions for DUO at the time of this assessment. As such, this assessment was based on the review of documents, interviews with personnel, and observations of limited evolutions and simulations. Documents were reviewed to determine if elements were in place to establish and define Y-12 programs. Personnel were interviewed to establish evidence of the level of understanding within the DUO plant population relative to the safety, health, environmental, and conduct of operations cultural condition. Evolutions and simulations were observed to evaluate DUO personnel relative to their ability to perform operational functions in a manner consistent with the formality and rigor expected by DOE Order 5480.19.

#### **5.5.1 Core Objectives Reviewed**

This assessment was conducted using COs-20 and -29. These COs, as documented in the YSORT Assessment Plan, require verification of personnel awareness of public and worker safety, health and environmental protection requirements, and the existence of a program to promote site-wide safety culture, respectively.

#### **5.5.2 Condition of Contractor Programs and Procedures**

The reviews, interviews, and observations indicated that a developing safety culture exists in the DU Organization. The working environment, the management and workforce attitudes, and the values promote safety. YSORT had previously evaluated the LMES employee concerns, lessons learned, and required



reading programs during prior assessments for Receipt, Storage, and Shipment (RSS) resumption and found them to be adequate. The limited opportunity to observe operations, however, limited the team's ability to fully evaluate DUO's performance in this regard.

As further indicators of safety culture, the team reviewed the occupational safety programs data. The occupational safety program was established at the Y-12 Plant when DOE adopted commercial industry standards of the Occupational Safety and Health Administration (OSHA) in 1989. Since that time, DUO has had 4,483 OSHA-related findings and has closed 4,470 of these findings to date. This safety record was indicative of a serious concern for safety and was evidence of a significant effort to create a safe working environment.

In addition to occupational safety, DUO radiological conditions also represent a hazard to workers. The team's review of the implementation and practices of the radiological protection program indicated that, although the new RadCon Program was not yet fully implemented, the attitudes and values of the workers and their management reflected an appropriate concern for safety.

### **5.5.3 YSORT Finding/Issue Closure**

Eleven findings consisting of eight pre-restart and three preoperation had been identified. Of the eight pre-restart findings, three had been evaluated for closure and conditionally approved.

### **5.5.4 Significant YSORT Restart Issues**

No specific restart issues were identified with respect to the Safety Culture Functional Area except those in the pre-restart findings. However, the DUO and Support Functions had not fully developed had matured its conduct of operations training, programs and procedures, or implementation practices as discussed in the other sections of this report.

### **5.5.5 Conclusion**

YSORT has determined that a sufficient Safety Culture exists to support an LMES recommendation to restart DUO, provided that acceptable dispositions were confirmed for all pre-restart findings and that the Restart Test Programs were acceptably executed.

## **5.6 Management**

YSORT evaluated the activities in the Management Functional Area using COs-24, -25, -27, and -30 and the associated criteria specified in the YSORT Assessment Plan for DUO. This evaluation included a combination of interviews, document reviews, observations, a review of the LMES MSA, and an observation and review of the LMES IRA.

### **5.6.1 Core Objectives Reviewed**

C0-24 required a determination whether functions, assignments, responsibilities, and reporting relationships were clearly defined, understood, and effectively implemented with line management control of safety. Also included in the scope of C0-24 was a review on the acceptability of resuming DUO without the use of mentors.

C0-25 required a determination whether 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. Also included in this CO were review activities associated with the overall performance of the LMES MSA.

C0-27 required a review to determine if nonconformances to applicable DOE Orders had been identified and if schedules for gaining compliance had been justified in writing and formally approved.

C0-30 required an assessment to determine if the breadth, depth, and results of the LMES IRA were adequate to verify the readiness of hardware, personnel, and management for operations.

## **5.6.2 Condition of Contractor Programs and Procedures**

### **5.6.2.1 Core Objective-24**

An assessment was performed to determine if the functions, assignments, responsibilities, and reporting relationships were clearly defined in LMES-approved documents and were adequately implemented throughout DUO.

DUO is a multi-organizational activity requiring the efforts of four separate organizations at Y-12; namely, DU Organization, WM, QO, and DSO. Also included in DUO was the control function performed by Y-12 Program Management.

Interviews and document reviews were conducted to determine if the resumption activities were performed and effectively implemented. Interviews were performed to gather information on the knowledge and awareness of the DUO personnel on their roles and responsibilities. The DUO support organizations' work activities relative to the DUO resumption scope were also assessed for adequacy.

From the review, several deficiencies were identified that indicated that the roles and responsibilities were not clearly defined, not well understood, and not effectively implemented specifically within the support organizations. As such, two pre-restart and three post-restart findings were identified during the course of this review. The pre-restart findings require resolution prior to resumption of DUO.

To address the DOE concern identified by Prerequisite No. 16 from the POA, the

assessment included a determination on the acceptability of resuming DUO without the use of mentors. RFA CSA-147B and the results of the LMES MSA addressing the compliance of DUO for compliance to the Nuclear Operations Conduct of Operations Manual were reviewed for this purpose.

The need for mentors was typically identified as a compensatory measure to address deficiencies in the area of DOE Order 5480.19 compliance. LMES prepared and submitted to DOE the RFA CSA-147B to identify deficiencies and corrective actions and to achieve DOE Order 5480.19 compliance in DUO. The need for mentors for DUO was -addressed in Section 4 of CSA-147B, which has been reviewed and approved by DOE.

The findings and observations identified by the MSA team were reviewed. None of the deficiencies posed a significant threat to the health and safety of the public, of the workers, or of the environment.

Based on the review performed and DOE's prior concurrence with CSA-147B, it was concluded that resumption of DUO without the use or need for mentors was justified. The health and safety risks associated with DUO were not considered significant to require the use of mentors as a compensatory measure. Further details of this assessment are documented in Assessment Reports 1224, YSORT-95-02166, and -02171.

#### **5.6.2.2 Core Objective-25**

YSORT reviewed the process employed by LMES to determine the adequacy of corrective actions taken to resolve deficiencies identified from internal and external assessments conducted since October 1993. Also included was a review of the deficiencies classified as post-restart to determine their acceptability to remain open post-DUO resumption. The review was performed by evaluating the evidence files compiled by DU Organization, QO, DSO, and WM.

Each of the organizations within the scope of DUO resumption compiled lists of internal and external assessments conducted since October 1993. The deficiencies, including corresponding corrective actions, were reviewed by the respective organizations management to determine if the corrective action taken was adequate and if it was evaluated for pre- or post-restart significance. Numerous observations and findings were identified from this review relating to the process differences among the organizations and documentation deficiencies, which were identified from the evidence file review.

Results from this review indicate that the process employed lacked consistency among the organizations involved with preparation of the evidence packages, and four pre-restart findings were identified to address these concerns.

An evaluation was performed on the LMES MSA for DUO. Included in this evaluation was a determination of whether the actions taken to close or resolve MSA pre-restart findings and observations were adequate. In addition, the

evaluation included a review of those findings classified as post-restart to determine if these findings were correctly classified.

The evaluation of the LMES MSA process was performed by a review of the MSA Assessment Plan, discussions with YSORT personnel, and a review of the MSA Final Report.

The following results were noted:

- All COs and prerequisites from the POA were included in the MSA Plan.
- Results of the MSA were documented in a final report. The final report was a comprehensive document that contained complete information to allow a review and understanding of the issues identified, their significance, and their impacts on resumption for each of the functional areas.
- The MSA Final Report provided a listing of all MSA participants. A review of these individuals' qualifications indicate that they were adequately qualified to perform the assessment. Participants in the DUO' MSA included those individuals who performed the RSS MSA and additional management and supervisory personnel from DU Organization.

No deficiencies were identified with the process with which LMES performed the MSA.

As of September 13, 1995, LMES reported that all pre-restart findings and observations were closed. The evidence files were reviewed to determine if the actions taken to close these findings were adequate. In addition, the findings, which were classified as post-restart, were evaluated to determine if these findings were appropriately classified.

The assessment was performed by a review of the MSA Final Report that contains all deficiencies identified during the course of the MSA (included in the report was the pre-/post-restart screening criteria), and a review of the evidence files was performed to determine the adequacy of the corrective actions.

Three classifications of deficiencies--Findings, Observations, and Evidence--were identified by the MSA team. In total, 124 deficiencies were identified. Of these, 29 were findings (19 pre-restart and 10 post-restart), 44 were observations (42 pre-restart and 2 post-restart) and 51 related to the evidence files.

Since DUO involve the activities of four Y-12 organizations, the deficiencies were grouped and assigned to specific organizations. The assignment/responsibility for resolution of the 124 deficiencies were as follows: Of the 29 findings, 15 were assigned to DU Organization (12 pre-restart and 3 post-restart); 11 were assigned to QO (6 pre-restart and 5 post-restart); 2 were assigned to DSO (both post-restart); and 1 pre-restart finding was assigned to WM. Of the 44 observations, 27 pre-restart were assigned to DU Organization; 9

pre-restart were assigned to QO; 2 pre-restart were assigned to DSO; and 4 pre-restart and 2 post-restart were assigned to WM.

From a review of the finding and observation closure evidence, it was concluded that the corrective actions were adequate to close a majority of the issues. However, some deficiencies were identified that apply to specific findings and observations and require additional corrective action to resolve. The deficiencies were identified as pre-restart findings and were contained in Assessment Reports YSORT-95-2172 and Assessment Report No. 73. Furthermore, the review of the pre/post-restart screening forms for the findings classified as post-restart indicates that the findings were appropriately classified with no deficiencies identified.

Further details of this assessment are documented in Assessment Reports Nos. 73, 408, YSORT-95-2159, -02164, and -02172.

### **5.6.2.3 Core Objective-27**

An assessment was performed to verify that baseline compliance reviews had been conducted on the 51 DOE Orders of interest to the Defense Nuclear Facilities Safety Board (DNFSB) and that non-compliances were addressed in DOE-approved RFAs or exemptions. The assessment also included a review to verify that compensatory measures, actions, and schedule commitments had been implemented and were effective. The assessment was performed by a review of the RSS C0-27 evidence files and assessment reports, DU Organization evidence files, documentation, correspondence, and interviews. From this it was determined that baseline compliance reviews had been conducted for the 51 DOE Orders of interest to the DNFSB, and all non-compliances applicable to DUO were addressed in DOE-approved RFAs.

For DU Organization and its support organizations, only RFA 82B and 147B were required to be approved by DOE prior to resumption. These RFAs had been reviewed and were approved by DOE. Compensatory measures were identified for DUO in CSA-82B. CSA-82B requires an implementation of the requirements defined in General Employee Training (GET) and Radiation Worker II and to train personnel in these requirements. GET includes information on facility safety, emergency preparedness, and radiation protection. Radiation Worker II includes posting and entry control, radiological work permits, and the selection and use of protective clothing for radiological protection. Training was verified under CO-13 and CO-16. GET and Radiation Worker II implementation was verified in C0-20. The RFA process was an on-going living process. Non-compliances were being adequately identified, documented, approved, and tracked to closure by systems in existence and were enhanced by Oak Ridge Operations, YSO, and LMES compliance personnel who stay in constant communication.

Further details of this assessment are documented in YSORT assessment reports YSORT-95-02148 and -02153. No findings were identified during the course of this assessment.

#### **5.6.2.4 Core Objective-30**

YSORT evaluated the LMES IRA to determine if the breadth, depth, and results were adequate to verify the readiness of hardware, personnel, and management programs to support resumption of DUO. Also included in this evaluation was a review of the actions and/or compensatory measures needed to resolve/close pre-restart findings identified by the IRA Team. The assessment was performed by a combination of observations and document reviews. YSORT also observed the interviews, document reviews, and field activities of the LMES IRA Team.

Observations of the LMES IRA Team activities indicate a significant improvement over the process employed during the assessment of RSS. The qualifications of the team participants were determined to be adequate for performing independent assessments. The training of the LMES IRA team was determined to be adequate to familiarize the team on the scope of the assessment and on the activities for an effective IRA. From a review of the Criteria and Review Approach Documents, it was determined that the breadth and depth of the LMES IRA were adequate to verify the readiness of hardware, personnel, and management programs to support the resumption of DUO.

No pre-restart findings were identified by the IRA Team. This is attributed to the limited resumption scope as defined by the POA, pre-/post-restart screening criteria given the health and safety significance of DUO, definitional differences between YSORT and LMES regarding findings or observations, and the fact that the DUO resumption effort is a two-tier process involving (1) resumption authorization, and (2) pre-operational evaluation of DUO' readiness prior to performing specific work activities.

Based on the results of this YSORT assessment, it is concluded that the LMES IRA was performed in a manner to effectively establish the readiness of DUO to resume operations. The activities performed by LMES were determined to be adequate in satisfying the acceptance criteria associated with this assessment activity as scoped by the POA.

#### **5.6.3 YSORT Finding/Issue Closure**

The findings identified by YSORT in the Management Functional Area are summarized in Appendix 7.2. The actual finding and contractor response documentation (when complete) will be available in YSORT evidence files.

All ten of the pre-restart findings had been provided to LMES for resolution. At the time of this report, LMES had not provided closure criteria or evidence to support the resolution. The resolution of these issues must be completed prior to DOE concurrence on DUO resumption.

#### **5.6.4 Significant YSORT Restart Issues**

No significant restart issues were identified during the performance of this

review, with the exception of the deficiencies identified in the findings. Those findings classified as pre-restart require resolution prior to DOE concurrence on resumption of DUO.

### **5.6.5 Conclusion**

Based on the results of the assessment activities associated with C0s-24, -25, -27, and -30, the activities performed by LMES were determined to be adequate in meeting the requirements defined by the assessment criteria, with the exception of the pre-restart deficiencies identified in the assessment reports. Contingent upon successful resolution of the YSORT pre-restart issues, it was concluded that all activities required by the POA had been completed to a level necessary to support resumption of DUO.

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## **6.0 ACRONYMS**

CO	Core Objective
CSA	Compliance Schedule Agreement
C	Calendar Year
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DSO	Disassembly and Storage Organization
DU	Depleted Uranium
DUO	Depleted Uranium Operations
GET	General Employee Training
IRA	Independent Readiness Assessment
LMES	Lockheed Martin Energy Systems, Inc.
MJR	Maintenance Job Request
MSA	Management Self-Assessment
NDE	Non-Destructive Examination
OJT	On-The-Job Training
OSHA	Occupational Safety and Health Administration
PDC	Performance Documentation Checklist
POA	Plan of Action
QO	Quality Organization
RadCon	Radiological Control
RFA	Request for Approval
RSS	Receipt, Shipping, and Storage
TDAG	Training Development and Administrative Guide
TIM	Training Implementation Matrix
TMS	Training Management System

UCOF Uranium Chip Oxidation Facility  
WM Waste Management  
YSO Y-12 Site Office  
YSORT Y-12 Site Office Restart Team

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## 7.0 APPENDICES

### 7.1 Team List and Biographies

#### Y-12 SITE OFFICE RESTART TEAM

Restart Manager - Thomas S. Tison  
Team Leader - Mark A. Sundie  
Team Leader - Dale E. Christenson  
Resumption Area Lead - Richard L. Renne

FUNCTIONAL AREA	TEAM MEMBER
Procedures	Gerald R. Mountain
Operations and Level of Knowledge	Kirk W. Van Dyne (Lead) Frank S. Poppell (Alternate)
Safety Culture	Richard L. Renne
Facility Conditions	George Napuda
Training and Qualification	Thomas Rogers
Management	Randy C. Foust (Lead) Peter R. Kulesza (Alternate)
Technical Editors	Plackeel Eapen Donald A. Beckman
Quality Assurance	Amye E. Rice
Administrative Support	Kay F. Dutton Kimberly E. Hurd Nicola P. White

#### **YSORT Biographies**

Donald A. Beckman

Mr. Beckman has 25 years experience in the management, operation, maintenance, design, and regulation of nuclear power plants and defense facilities. He holds a B.S. degree in Marine Engineering from the U.S. Merchant Marine Academy, 1969. Since 1982, he has been providing consulting services to government and industry. His assignments support nuclear utilities and the Department of Energy (DOE) in the development and evaluation of management programs. Ongoing engagements include support to the Nuclear Regulatory Commission (NRC) in special inspections, support to the DOE for management of production programs, major design and construction projects, facility startup and restart, and to nuclear



utilities in the areas of management and quality program support. Prior to his consulting career, Mr. Beckman was the first NRC Senior Resident Inspector assigned to the Beaver Valley Power Station in 1979. His career with NRC spanned 1977-1982 and included duty as a region-based inspector in the areas of operator training, quality assurance, operations, maintenance, and engineering. He was part of NRC's immediate response team for the Three Mile Island Accident. His last assignment involved management of an engineering section responsible for general systems engineering, fire protection, environmental qualification of electrical equipment, and related subjects. From 1976 to 1977, Mr. Beckman was a startup and test supervisor for Burns and Roe's for the Clinch River Breeder Reactor and a variety of nuclear and non-nuclear generating station projects. In 1971, Mr. Beckman as a test engineer for submarine reactor plants, joined Newport News Shipbuilding and Dry Dock. During the next 5 years, he certified as Shift Test Engineer, directed the refueling and overhaul activities of nearly two dozen nuclear submarines, and served as Chief Test Engineer and Delivery Engineer for the last two 637 Class attack boats. From 1969 to 1971, Mr. Beckman served as a U.S. Coast Guard and U.S. Atomic Energy Commission - licensed engineering officer on board the Nuclear Ship Savannah, the first and only U.S. civilian-operated, nuclear-powered merchant ship culminating as a shift supervisor. He also served intermittently as an engineering officer on oil-fired steam and diesel-powered merchant ships.

#### **YSORT Biographies (continued)**

##### **Wayne L. Britz**

Mr. Britz received a B.S. degree from the U. S. Merchant Marine Academy and a M.S. degree in Nuclear Engineering, from the Georgia Institute of Technology. He was a nuclear engineer, health physicist, deck officer, and an Atomic Energy Commission-licensed reactor operator on the Nuclear Ship Savannah from 1966 to 1970. He was an inspector, nuclear engineer, and health physicist for the Atomic Energy Commission/Nuclear Regulatory Commission from 1971-80 where he developed criteria and guides supporting regulations, and evaluated systems for their ability to meet regulatory requirements. He was Manager of Radiation Protection Services at Public Services Electric and Gas Company (PSE&G) from 1980 to 1986 where he was responsible for the radiological protection program for the Salem and Hope Creek nuclear power plants to comply with Nuclear Regulatory Commission regulations. At PSE&G, he was responsible for the radiological environmental monitoring program and for radiological support to the emergency preparedness program. He provided expert witness and written testimony to the government and private industry. Since 1986, Mr. Britz has been a consultant to various government agencies, nuclear power utilities, and private industry. He served as a Project Manager for the Center for Disease Control's dose reconstruction project at the Idaho National Engineering Laboratory. He was a member of the DOE Plutonium Vulnerability Study at the Pantex Plant. He has conducted Operational Readiness Reviews for the Department of Energy at Rocky Flats, the Waste Isolation Pilot Plant, and Savannah River.

#### **YSORT Biographies (continued)**

##### **Dale E. Christenson**

Mr. Christenson received a B.S. degree, in Civil Engineering from the University of Washington and a M.S. degree, in Civil Engineering from the University of Maryland. He is a

registered Professional Engineer in the State of Maryland. He has five years experience in the nuclear operations field. As an officer in the Department of Defense, he served for eight years in the Naval Nuclear Reactor program, which is recognized as one of the most respected nuclear programs in the country. While in the Navy, he served in the engineering department for three years and was certified to act as an Engineer on board U.S. Naval Vessels with nuclear plants. He joined the Department of Energy (DOE) in 1991 and has been a member of Y-12 Site Office since August 1994. Mr. Christenson has completed the Conduct of Operations assessment training conducted by EM-25. He has also received training on DOE Order 5480.31, "Restart of Nuclear Facilities." He has been instrumental in the development of the Plan of Action for the "DOE Readiness Assessment for Receipt, Shipment, and Storage of Special Nuclear Material at Y-12 Plant."

### **YSORT Biographies (continued)**

#### **Plackeel Eapen**

Dr. Eapen earned a PH.D. degree, in Nuclear Physics and Engineering from, Southern Methodist University and a M.A. Degree, in Business Administration, with a major in Organization Management from Rutgers State University. He has over 25 years of diversified experience in research, architect/engineering, operations, and regulatory fields of nuclear power industry. Dr. Eapen held progressively responsible positions through out his career, including 13 years at the Nuclear Regulatory Commission as an inspector and first-line supervisor. Since 1985, he has managed complex team readiness inspections and assessments for the Nuclear Regulatory Commission, including the startup of the controversial Seabrook Nuclear Power Plant in New Hampshire. He was responsible for managing a minimum of two complex team inspections each fiscal quarter in the areas of maintenance, operational readiness, probabilistic risk, motor-operated valve, and service water. Dr. Eapen was responsible for conceptually designing these complex inspections and assessments, staffing the teams, and monitoring the day-to-day progress of each team. He personally led the pilots for some these inspections. Additionally, he led several reactor team inspections, including the Augmented Inspection Team at Nine Mile Point to assess the loss of ultimate heat sink and the inadvertent lifting of fuel assemblies, while removing the reactor vessel head during refueling at Indian Point 3. Dr. Eapen is a certified lead auditor and qualified Nuclear Regulatory Commission inspector. He has extensive training and demonstrated knowledge in MORT, accident investigation, quality assurance, Kepner-Tregoe, Total Quality Management, and Probabilistic Risk Assessment.

### **YSORT Biographies (continued)**

#### **Randy C. Foust**

Mr. Foust received a B.S. degree, in Mechanical Engineering and a M.A. degree, in Business Administration from the University of Tennessee, Knoxville, and has 15 years experience in the nuclear field. Prior to his current assignment at the Department of Energy (DOE) Y-12 Site Office, Mr. Foust spent 5 years at DOE's Savannah River (SR) plant where he was initially employed by Westinghouse Savannah River Company (WSRC) in the Reactor Quality Assurance Department of the Reactor Division and later transferred to the Environmental Protection Department of the ESH&QA Division. At SR, Mr. Foust was

assigned duties of Division Coordinator for interface and resolution of DOE Findings, Lead Quality Engineer for the review of Design Modification Packages, ALARA Committee Member, Quality Representative on the Startup Test Review Board, Principal Engineer/Team Lead on the Readiness Self Assessment for Chargeback and Restart of K-Reactor, and Environmental Support and Regulatory Interface for Transition and Decontamination & Decommissioning activities. Prior to joining WSRC, Mr. Foust spent 10 years working in the commercial nuclear field. Initially, Mr. Foust worked for the Tennessee Valley Authority where he was assigned duties of Responsible Systems Engineer for the construction, modification and testing of NSSS and Safety Systems on a Westinghouse POOR, and later, Staff Specialist on Environmental Qualification per 10CFR50.49. He also worked on the Clinch River Breeder Reactor Project as an Assistant Cognizant Engineer for Westinghouse, Advance Reactor Division, and spent two years working as a Marketing Manager and Senior Environmental Qualification Engineer for a independent engineering materials testing laboratory.

### **YSORT Biographies (continued)**

#### **Peter R. Kulesza**

Mr. Kulesza received a B.S. degree, in Mechanical Engineering from Bucknell University and has over 14 years of experience in the nuclear field. Prior to joining DOE's Restart Team at Y-12, he was employed by Midwest Technical Inc. During that two-year period, he worked as the assistant manager and coordinator for the condition assessment survey of facilities at Y-12. Mr. Kulesza worked for Lockwood Greene Engineers for 11 years in various capacities ranging from lead engineer to planning consultant. His responsibilities included determining the scope, schedule, and budget for projects, as well as managing all technical disciplines for several interstate projects simultaneously. While with Lockwood Greene, Mr. Kulesza was involved with facility, utility, and process upgrades, and conceptual designs. The work encompassed chilled water, steam, compressed air, perchloroethylene, oxygen, ventilation, and acid recovery systems; biodenitrification; uranium reclamation processes from digestion to derby production; vacuum casting and ingot processing; core element machining; and scrap processing. He has also conducted process improvement work for the metals, heat pump, and rubber industries. This work was performed in facilities in Tennessee, Kentucky, and Ohio.

### **YSORT Biographies (continued)**

#### **Gerald R. Mountain**

Mr. Mountain has A.S. and B.S. degrees, in Nuclear Engineering and over 25 years experience in the nuclear field. He is a Cum Laude graduate of North Carolina State University and a graduate of the Navy nuclear power program. Since 1992, he has been involved full time in supporting The Department of Energy (DOE) and its contractors in the areas of procedure program development, assessment, and improvement. During 1992, he served as a mentor for EGI6 Rocky Flats to the Director, Plant Procedures. Tasks performed included assessment of the plant procedure and document control programs and development and implementation of program improvements. In 1993 he supported the staff of the Office of Nuclear Safety by assisting in the implementation of a new division procedure program, developing a DOE Facility Procedure Program Assessment Plan, performing procedure

program assessments, and was a member of the DOE Spent Fuel Task Force that performed assessments of the status of spent fuel facilities at eleven DOE facilities. Mr. Mountain is a member of the DOE Procedure Standards Committee, which has been responsible for the development of DOE standards on procedures. During 1994, he performed an order compliance assessment at Pantex for Mason & Hanger on DOE Orders 5480.21, 22, 23, and 24. In the commercial nuclear field, he has been an Nuclear Regulatory Commission Licensed Senior Reactor Operator at a commercial boiling water reactor (BWR), a procedure program manager, an operator trainer, and technical consultant. From 1978 to 1981 he was the Inspection Manager for BWR inspection for American Nuclear Insurers (ANI) where he was responsible for the management and performance of ANI semi-annual inspection activities at all commercial BWRs. During this time, he was also a certified Quality Assurance lead auditor. Prior to entering the commercial nuclear industry, he served ten years in the U.S. Navy as a Reactor Operator, Gunnery Officer, ASW Officer, and is a graduate of the Naval Enlisted Scientific Education Program.

### **YSORT Biographies (continued)**

#### **George Napuda**

Mr George Napuda has over 30 years experience in commercial and naval nuclear power, vendor control, and manufacturing. He is a graduate of Picatinny Arsenal Toolmaker School and attended Franklin and Marshall College and Fairleigh Dickinson University. He holds Journeyman Certification from the Department of Army and Federal Committee on Apprenticeship, a B.A. degree, in Liberal Arts and Science and an M.A. degree, in Industrial Psychology. He has held certifications, based on formal examinations, in eddy current, magnetic particle, liquid penetrant, radiographic, ultrasonic, and visual nondestructive testing techniques; statistical quality control, metrology, and vendor evaluation; and management oversight, performance evaluation, and severe accident overview. He has also earned a number of other certifications by examination including Pressurized Water Reactor Facilities and Regional Inspector (Nuclear Regulatory Commission (NRC)); Lead Auditor (utility); and Oxygen Breathing Apparatus (Department of Interior). He has participated in comprehensive management, program, and performance assessments for almost two decades both as a team member and a team leader. He has successfully completed a number of international assignments, presented technical presentations at professional conferences, and presented adult technical training courses. Examples of areas in which he was instrumental in effecting industry performance improvements include design, procurement, material management, quality assurance, and quality control programs; corrective action methodology; root cause analysis; and maintenance, training, and manufacturing processes. He has presented technical papers at international, national, and regional levels. He has given formal training sessions and "field" training to the Department of Energy, the NRC, and utility technical and professional staff. His career has included positions with private industry, Department of Defense, and NRC. He is now serving as a consultant to the Department of Energy, NRC, and the domestic and international nuclear power industries.

### **YSORT Biographies (continued)**

#### **Frank S. Poppell**

Mr. Poppell received a B.S. degree, in Nuclear Engineering, from the Georgia Institute of Technology and has eighteen years in the nuclear field. He has three years experience at the DOE Rocky Flats and Savannah River facilities performing safety evaluations, assisting with the resolution of DOE issues for restart of K-Reactors, evaluating Department of Energy (DOE) oversight concerns (Operational Readiness, Tiger Team, and Defense Nuclear Facility Safety Board Reviews) for incorporation into waste management facility startup documents, and performing DOE Order compliance assessments. He has eleven years experience in the commercial nuclear industry primarily in the areas of Licensing/Regulatory Compliance, Reactor Engineering, and Operations as a Shift technical Advisor. His commercial nuclear power experience includes coordinating resolution of Nuclear Regulatory Commission issues, providing Operations oversight for Technical Specification operability and reportability determinations, directing control rod movements and power maneuvers, and preparing/reviewing Unreviewed Safety Question evaluations. He also has four years nuclear experience at Charleston Naval Shipyard as a Shift Test Engineer coordinating reactor plant testing on submarines during overhaul and refueling.

#### **YSORT Biographies (continued)**

##### **Richard L. Renne**

Mr. Renne received a M.S. of Public Health Degree in Health Physics, Medical Physics, and Environmental Health from the University of Minnesota. He has 25 years of experience in operational health physics, medical radiology, environmental health in governmental, private, and institutional operations. He has served in international operations as technical liaison to the Federal Republic of Germany, the Republic of South Korea, and the British Ministry of Defense. He has served as consultant/radiological advisor to Salem and Cooper nuclear power facilities, Professor and Chairman of the Department of Radiological Sciences, University of Tennessee Center for Health Sciences, Radiation Manager at Pantex, Fernald, and Rocky Flats, Chief Health Physicist for the US Army Missile Command, and Radiation Specialist for the 4th Naval district as an Officer in the United States Navy. Mr. Renne has operational experience in radiological devices and applications including medicine, operational health physics, lasers, electro-magnetic pulse technology, and nuclear weapons. He has served as consultant to numerous private enterprise companies in association with new product development and marketing techniques. Mr. Renne has been an instructor, evaluator, and assessor for Conduct of Operations implementation at various locations. He received his initial NRC assessment training as a health physicist employed with an agreement state for nuclear licensing, inspection, and evaluation. Mr. Renne has qualified as an NRC licence manager for medical and operational sources. He started his career by obtaining National Certification from the American Registry of Radiologic Technology for medical uses of radiation and radiation producing devices.

#### **YSORT Biographies (continued)**

##### **Amye E. Rice**

Ms. Rice has worked for the Department of Energy (DOE) as a Quality Assurance Specialist for approximately eight years. She achieved this position by completing both on the job and classroom training in a structured two-year upward mobility training program. Her

responsibilities as a Quality Assurance Specialist, consisted of monitoring, inspecting, analyzing, and investigating components used in assemblies and subassemblies for nuclear weapons ensuring products adherence to policies, procedures, and personnel requirements. Health, safety, and housekeeping issues were also monitored. Her inspection of parts relied on guidance from DOE and contractor procedures and Design Agency drawings. Ms. Rice performed visual inspections of production processes and customer specifications, reviewed test results, and oversaw sample testing operations. She also reviewed certificates of inspection and certified part cards. Weapons and non-weapons storage were included in the reviews. Ms. Rice has experience in classified document accountability processes, occurrence reporting, self-assessment activities, non-weapon oversight and surveys, corrective action plan tracking, and master surveillance plans development for the Y-12 Site Office. Prior to her work with DOE, Ms. Rice served as a secretary at the Clinch River Breeder Reactor. The division she was attached to had oversight responsibilities for the construction contractor, Stone & Webster. This position involved office management, assisting engineers with procedure reviews, report generation, and typing and filing for a staff of fourteen.

### **YSORT Biographie (continued)**

#### **Charles H. Robinson**

Mr Robinson has B.S. degree in Chemical Engineering from the University of Massachusetts and has completed graduate course work toward a M.S. Degree in Nuclear Engineering at the University of Lowell. He has seven years experience in nuclear criticality safety. Prior to contracting with the Department of Energy through Enercorp Federal Services Corporation in 1995, he was employed as a Nuclear Criticality Safety Engineer by Babcock & Wilcox, Naval Nuclear Fuels Division, in Lynchburg, Virginia. While at Babcock & Wilcox, he performed criticality safety analyses; served as a certified quality assurance reviewer of analyses; reviewed and approved procedures; and conducted audits, assessments, and investigations. Prior to Babcock & Wilcox, he was employed by the U. S. Nuclear Regulatory Commission (NRC) as a Nuclear Process Engineer and Chemical Engineer, and was certified as an NRC Incident Investigator. While at the NRC, he performed various licensing and inspection activities for licensed nuclear fuel cycle facilities, including reviewing and approving license amendments; performing independent criticality safety analyses; and conducting operational team assessments, augmented inspections, and root-cause investigations. His assessment/inspection/restart experience, as a team member, at facilities includes Allied Chemical, Babcock & Wilcox, Combustion Engineering, General Electric, Nuclear Fuel Services, Sequoyah Fuels, Siemens, and Westinghouse, and involves commercial fuel production, naval nuclear fuel production, uranium hexafluoride production, uranium recovery, and waste treatment.

### **YSORT Biographies (continued)**

#### **Thomas Rogers**

Mr. Rogers received a B.S. degree in Nuclear Engineering from the Georgia Institute of Technology and has seventeen years experience in the nuclear field. He has over four years experience at Department of Energy (DOE) facilities working for DOE's Office of Nuclear Safety where he performed assessments at the Princeton Tokamak and the Los Alamos TA-55

Plutonium Facility. He served as an Operational Readiness Review team member for Westinghouse Savannah River Company at the Savannah River K-Reactor and Intank Precipitation Facility. He has eight years experience in the commercial nuclear industry where he participated in numerous performance-based assessments including conduct of operations assessments, emergency operating procedure assessments, safety system functional inspections, and quality assurance audits. He also participated in restart efforts at the Sequoyah, Indian Point 3, North Anna, and Rancho Seco nuclear power stations. Additional commercial nuclear power experience includes over three years with the Nuclear Regulatory Commission where he served as an operator-licensing examiner for pressurized water reactors. He has five years experience at a naval shipyard as a nuclear shift test engineer on fast attack submarine and cruiser reactor plants.

### **YSORT Biographies (continued)**

#### **Mark A. Sundie**

Mr. Sundie has a B.S. degree in Nuclear Engineering from the Pennsylvania State University and has over 15 years experience in the nuclear field. Prior to joining the Department of Energy (DOE) in late 1989, he was employed by the Tennessee Valley Authority (TVA) for ten years, where he was assigned to the Bellefonte Nuclear Plant in Scottsboro, Alabama, as a Systems Engineer and Reactor Engineer. While at Bellefonte, he completed the training programs for Shift Technical Advisor and Station Nuclear Engineer. He also spent five years at the Sequoyah Nuclear Plant in Soddy-Daisy, Tennessee, where his duties included nuclear engineering, reactor core surveillance, Restart Test Director, and Refueling Test Director. Mr. Sundie joined DOE in late 1989 at the Savannah River (SR) Operations Office under the Assistant Manager for Defense Programs, Separations Division. His first assignment was as a Facility Representative for FB-Line, 247F, and 235F facilities. He served in this position for three years. In his next assignment as Program Engineer for Separations F-Canyon programs and Division Training Liaison, Mr. Sundie participated in the Order Compliance reviews for HB-Line, FB-Line and F-Canyon and completed all the necessary division requirements for subject matter expert in the area of Training and Qualification programs. His restart experience consists of roles as a team member in the HB-Line, FB-Line, and 247F Operational Readiness Reviews. Most recently, he served as the DOE-SR Team Leader for both the F-Canyon and FB-Line Restart efforts, where he supervised eighteen subject matter experts from the DOE-SR staff and validated the contractor's state of readiness prior to commencement of the independent Operational Readiness Review. Mr. Sundie came to the Y-12 Site office in February 1995, where he currently serves as the Technical Support Team Leader.

### **YSORT Biographies (continued)**

#### **Thomas S. Tison**

Mr. Tison received a B.S. degree, in Aerospace Engineering from Virginia Polytechnic Institute and a MBA, in Research and Development from Florida State University. He also completed courses of study at the U.S. Air Force (USAF) squadron Officer's School and Air Command and Staff College. Mr. Tison has 15 years experience with the Department of Energy (DOE). Prior to his position as Restart Team Manager, he served as Site Manager for

the DOE K-25 Site Office. He provided direction to the Management and Operations contractor with a work force of 1800 employees. The primary focus of the K-25 Site is environmental restoration and waste management activities. Mr. Tison was responsible for ensuring that effective programs were established and maintained by the contractor for environmental, safety, and health permitting and compliance with national programs, such as the Clean Air Act; Clean Water Act; Resource Conservation and Recovery Act; OSHA; and Nuclear Safety. Mr. Tison was also responsible for the safe, compliant, efficient operation of the Toxic Control Substance Act incinerator. He supervised fifteen federal employees and provided direction to eleven contractor employees. Previous to his work at K-25, Mr. Tison served in positions ranging from Program/Project Engineer to Program Management Branch Chief at the DOE Y-12 Site Office. He was involved in the design and construction of numerous capital construction projects and was responsible for establishing and implementing project management policy and guidelines. Before joining DOE, Mr. Tison performed work for the Clinch River Breeder Reactor. He also served 10 years in the USAF as a program control officer, configuration manager, and structural engineer.

#### **YSORT Biographies (continued)**

##### **Kirk W. Van Dyne**

Mr. Van Dyne has over 15 years of nuclear regulatory experience in the U.S. Navy nuclear propulsion program, commercial nuclear power program, and Department of Energy (DOE) facilities. He has a broad technical background in the areas of operations, licensing/regulatory compliance, inspection, and oversight. Mr. Van Dyne received a B.S. degree, in Civil Engineering Technology from Virginia Polytechnic Institute and State University. Prior to his involvement in the assessment of resumption activities at Y-12, Mr. Van Dyne consulted to the Nuclear Regulatory Commission (NRC) at Tennessee Valley Authority (TVA) Watts Bar nuclear facility. In this capacity, he augmented NRC inspection resources to determine TVA's readiness for receipt of an operating license. Mr. Van Dyne consulted to Westinghouse Savannah River Company (WSRC) and participated in the development and implementation of the Systematic Evaluation Program (SEP). He contributed a commercial nuclear regulatory perspective to this evaluation program. Prior to the SEP, his efforts were focused on the resolution of issues relating to the K-Reactor restart as well as the development and implementation of the post-restart issue management system. For three years, Mr. Van Dyne assisted in the restart and startup of troubled commercial nuclear plants, including Comanche Peak and Turkey Point. During these periods Comanche Peak received an operating license and Turkey Point was removed from the NRC's list of Category "3" plants. Mr. Van Dyne was also employed by the NRC where he held various positions, including that of Resident Inspector. He received advanced training in both pressurized water and boiling water reactor technologies. While employed by the U.S. Navy, Mr. Van Dyne served as a Shift Test and Chief Test Engineer at Norfolk Naval Shipyard. His responsibilities included the planning, supervision, and review of plant condition changes and post maintenance testing in support of the overhaul of S5W and S6G submarine reactor plants.

#### **YSORT Biographies (continued)**

##### **Gary F. Weston**



Mr. Weston received a B.S. of Engineering degree in Marine Engineering, from the State University of New York Maritime College and has over 25 years experience in various engineering positions and assignments. Prior to joining the Y-12 Restart Team, he was employed by Stone and Webster Engineering Corporation where he served in positions as project manager for outage modifications, project design manager, certified lead auditor, lead startup engineer, consultant for events analysis and system operations assessments, design baseline verification program manager, and construction completion planning supervisor for various nuclear utilities. During this period of employment, he spent two years with the Institute of Nuclear Power Operations as a program manager in the Events and Analysis Division, which was responsible for plant operations assessments and event analysis. Prior to these assignments, he was employed by EDS Nuclear as superintendent of mechanical quality engineering for a nuclear construction project, by LPL for both field engineering and startup and test engineering positions and by Newport, News Shipbuilding as a nuclear construction supervisor for overhaul and refueling of S5W plants. Previous to these nuclear assignments, he served in 2nd and 3rd assistant engineering positions aboard various US merchant vessels.

## 7.2 YSORT Findings

### YSORT

<b>Finding Number</b>	<b>Description</b>	<b>Core Objective(s)</b>	<b>Functional Area</b>	<b>Pre-Restart</b>	<b>Post-Restart</b>
*73.01	Findings that were previously closed by the MSA based on draft documents remain in a noncompliance condition, and the change request could not be located within DUO or Quality as required by the closure criteria.			13 TQ	x
73.02	The TIM does not include D&S Material Coordinator as a qualified position in Building 9720-18, and the D&S Technical Support personnel that were included in the TIM could not be identified.			13 TQ	x
*73.03	Building 9720-18 D&S training programs are not in compliance with the TIM.			13 TQ	x
*79.01	None of the DUO personnel identified for meeting the minimum staffing requirements are current in all the established training requirements.			13 TQ 18	x
80.01	A finding was issued when YSORT determined that the justification for waiver of minimum education requirements for a manager was not recognized by DOE Order 5480.20			14 TQ	x
81.01	A finding was issued when YSORT identified that five DUO personnel on the resumption crew were not current in their training on the CONOPS manual, Module 13547.			19 TQ	x
83.01	None of the radiographers or weld inspectors (dye penetrant) are current in all the required training for DUO resumption.			18 TQ	x
83.02	None of the 9201-5 and 9201-5N Dimensional Inspection Personnel are current in all the required training for DUO resumption.			18 TQ	x
84.01	A finding was issued when YSORT determined that Performance Documentation Checklist evaluations were being performed in group sessions.			13 TQ	x
405.01	A finding was issued when YSORT determined that the implementation			19 OP	x

	of applicable Conduct of Operations requirements, as discussed in CSA-147B and committed to in the DUO POA, had not been accomplished.			
406.01	During simulated performance of the Arc Melt and Casting procedures, operators incorrectly verified valve positions. Valves that were required to be closed were verified by operators in the open direction.	19	OP	x
407.01	DUO has not clearly defined the roles and responsibilities of personnel identified in the Conduct of Operations Manual.	19	OP	x
407.02	All DUO area boundaries have not been defined for the facilities in which DUO is a "tenant," as required by Chapter I and Appendix III of the Conduct of Operations Manual.	19	OP	x
408.01	Evidence provided for resolution of MSA findings and observations (OP-1, OP-3, OP-16, or OP-23) was incomplete or inadequate. Evidence files are not updated to provide evidence of closure for items previously stuated as open.	25	MG	x
1071.01	Procedure 70-100 requires that anit-C gloves be removed prior to contact with non-contaminated, no-working surfaces. This requirement was not met during the subject MSA.	19	SC	x
1071.02	Procedure Y50-24-18-143 meet the criteria for a Class I procedures per Procedure Y10-102, yet it is labeled as a Class II procedure.	7	PR	x
1423.01	DUO procedures have been classified for use without completing the necessary paper work to formally make a change to a procedure.	7	PR	x
1423.02	A finding was issued when YSORT determined that Procedure Y50-24-33-001 was improperly revised in violation of Y10-102.	7	PR	x
1423.03	Procedure Y50-24-33-001 history files contains verification forms that are annotated for steps 4, 5, and 6. The steps in performing a verification need to be performed as stated on the applicable checklist.	7	PR	x
1425.01	Issuance of a memo to control the procedures document control function within DUO is an unacceptable method of implemented the process.	7	PR	x
1426.01	A finding was issued when YSORT identified minor problems with the documentation provided for Evidence Packages CA01.04 and AM01.04.	7	PR	x
*1816.01	A restart test program has not been developed for the NDE area to address the calibration, start up of equipment such as the lower voltage radiographic equipment; and testing of radiography support systems such as interlocking alarms.	28	FS	x
*1816.02	A restart test program has not been developed for the Dimensional Measurement Area to address calibration of devices and equipment.	28	FS	x
*1817.01	A finding was issued when YSORT identified the non-inclusion of support equipment required to operate the arc melter. No calibration stickers were displayed for pressure gauge HS/L-PI-0101 and two hydraulic valve operators.	28	FS	x
*1819.01	A finding was issued when YSORT identified the non inclusion of support equipment required to operate the arc melter. No calibration stickers were displayed for pressure gauge HS/L-PI-0101 and two hydraulic valve operators.	28	FS	x
*1819.02	There was no evidence that the computer program that supports	28	FS	x

operation of the arc melt furnace will be verified/validated prior to restart or that engineering staff will be present for initial operation.

*1819.03	Although DUO recognized the need for periodic standby operational verifications to be performed monthly, the restart test program did not recognize the need for periodic standby operational verifications.	28	FS	x
*1820.01	Velometers installed at the face of each two hoods are not included in calibration recall. The portable anemometer is listed in the restart test program and required to be calibrated, yet it is not addressed in the procedure.	28	FS	x
*1820.02	A finding was issued when YSORT determined that Procedure Y50-24-33-001 does not require verification of thermometer calibration nor does the restart test program list such a device.	28	FS	x
2133.01	Procedure Y50-24-33-001 is not technically adequate to support resumption of the gold recovery.	7	PR	x
2140.01	RWP did not provide adequate information that clearly describes the personal protective equipment necessary to proceed in radiological areas.	20	SC	x
2140.02	Personnel Contamination Monitors at boundary control stations did not have identifiable information related to daily operable performance tests to the specific devices.	20	SC	x
2140.03	Boundary Control Station No. 15 exit posting has fallen off the all and is partially obscured by a yellow decontamination can.	20	SC	x
2154.01	A finding was issued when YSORT identified an unacceptable posting.	20	SC	x
2157.01	Numerous plant-wide procedure exist which implement DOE Order 5480.19. It would be appropriate for these procedures to implement the Conduct of Operations manual.	19	OP	x
2157.02	DUO Conduct of Operations RFA does not specify the method by which ConOPs is implemented with the Quality Organization.	19	OP	x
2161.01	During a walkthrough of Procedure Y50-24-18-143, Operation of 3N, 4N, 5N, and 6N, a member of the LMES RA Team was observed operating equipment.	29	SC	x
2163.01	A finding was issued when YSORT determined that RWPS were incomplete and did not identify shoe cover personal protective clothing for entering a High Contamination Area. RWPs did not authorize the use of RWP Supplemental Information Form.	7 20 23 30 24	SC	x
2163.02	Radiological contamination should be controlled nearest the source.	7 20 23 30 24	SC	x
2163.03	A finding was issued when two LMES RA team members signed a RWP and entered a High Contamination Area without recognizing that the RWP was incomplete and did not specify personal protective clothing.	7 20 23 30 24	SC	x

2163.04	Electroplating personnel were unable to complete simulation of LMES Procedure Y50-24-33-001.	7 20 23 30	SC	x
		24		
2163.05	RWPs and boundary control stations have not been adequately maintained. RWPs are incomplete and contain erroneous information.	7 20 23 30 24	SC	x
2164.01	A finding was issued when YSORT determined that revisions and changes to documents were being made without initialing and dating the change.	25	MG	x
2164.02	Deficiencies that were identified during LMES interviews should have been incorporated into the Corrective Action System and evaluated for pre/post restart significance.	25	MG	x
2164.03	A finding was issued because the Quality Organization failed to perform a complete review of deficiencies as required by Core Objective 25.	25	MG	x
2164.04	Issues or findings assigned to other Y-12 Organizations and DSO should have been incorporated in the scope of Prerequisite 10 from the DUO POA.	25	MG	x
*2165.01	Two unidentified wire jumper/leads were draped over the railing of the deck above Casting Furnace 4N located in Building 9998.	28	FS	x
2166.01	Functions, assignments, responsibilities, and reporting relationships are not clearly defined for DUO.	24	MG	x
2166.02	A finding was issued when YSORT determined that there is no integrated relationship between the Nuclear Conduct of Operations Manual and site level programs to ensure that roles and responsibilities are clearly defined and interfacing.	24	MG	x
2166.03	Individuals within the Quality Organization did not know their Organization Unit Manager as defined by the memorandum of understanding between Quality and DUO. They were not trained or given any instruction of the Conduct of Operations Manual.	24	MG	x
2166.04	A finding was issued when YSORT determined that no memorandum of understanding existed between Quality, DSO, and EUO.	24	MG	x
2166.05	The approved Quality Organization organizational chart does not reflect the Conduct of Operations Manual.	24	MG	x
2167.01	Procedure Y50-24-81-005 was changed after the procedure approvals were obtained.	7	PR	x
2172.01	Some of the findings identified by the MSA team were applicable to all organizations involved in the DUO resumption effort. The screening forms for organizations that were assigned responsibility for common findings was not contained in the MSA report.	25	MG	x

2172.02	Review of the evidence files for SV-01 and SV-03 revealed that the actions taken were inadequate for closure of the findings be were adequate for the purpose of resolving the issue for resumption.	25 MG x
2172.03	A finding was issued when YSORT identified a discrepancy in Evidence File SV-03. The evidence file referred to Procedure Y50-37-81-007 and the procedure contained in the evidence file was Y50-37-81-005.	25 MG x
2172.04	A finding was issued when YSORT determined that standing orders were signed by DUO Organization Unit Manager instead of the Operation Manager and that standing orders were not reviewed by affected personnel within DUO, as required by Y10-105.	25 MG x
2172.05	No documentation was contained in the evidence files to support closure of MSA Observation Pre-01 and Pre-02 as required by Y60-160.	25 MG x

### **7.3 LESSONS LEARNED**

YSORT reviewed its activities and those of the LMES DUO, of the LMES MSA, and of the IRA to identify areas in which LMES should improve during future resumption activities.

1. Similar to the experience in RSS, the operations support organizations' (QO, Plant Shift Superintendent's Office, Facility Management Organization, etc.) interfaces with the primary organization, DU Organization, were not well defined and managed. For example, the QO involvement in conduct of operations activities was insufficient, based on their overall role in DUO support.
2. Also similar to the RSS experience, in many cases LMES management expectations were based on meeting minimal performance standards instead of excellence. As a result, actual performance, in many areas, did not achieve DOE's expectations. For example, the support organization's responsible for boundary control station housekeeping met neither the DOE nor the DUO Manager's expectations, resulting in DUO taking extraordinary action to ensure adequate conditions were established and maintained.
3. DUO made substantial improvements, in some respects, over the RSS performance and effectively used the prior lessons learned. This positive performance should also be viewed as a lessons learned for future resumptions:
  - a. DUO meetings and management activities were generally performed in an organized and business-like manner with DUO management providing clear and consistent expectations for the participants.
  - b. The DUO IRA overcame many of the performance problems of the RSS IRA such as communication and viability of the IRA process, team organization and coordination with DOE and DUO, and the effectiveness of team meetings.
  - c. The DUO management team approached problems with a positive attitude and accepted ownership and accountability for their performance. This enabled the interface with DOE to work more effectively and for problems to be addressed and closed more efficiently.

## 7.4 REFERENCES

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18. Lockheed Martin Energy Systems, Inc., Y-12 Plant Procedure, Y50-24-81-005-, "Operation of the Lectromelt Arc Melt Furnace B-3001," September 5, 1995.
19. Lockheed Martin Energy Systems, Inc., Y-12 Plant Procedure, Y50-2418-143, "Operation of 3N, 4N, 5N, and 6N Casting Furnaces", July 10, 1995.