

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 19, 1993

**MEMORANDUM FOR:** G. W. Cunningham

**COPIES:** Board Members

**FROM:** J. T. Arcano, Jr.

**SUBJECT:** Oak Ridge Trip Report for July 12-15, 1993,  
Evaluation of DOE Quality Assurance Assessment

1. **Purpose:** This memorandum describes the observations of Defense Nuclear Facilities Safety Board (DNFSB) technical staff (J. T. Arcano, Jr.) and Outside Expert (J. D. Porter) while evaluating the effectiveness of a Department of Energy (DOE) Quality Assurance Assessment (QAA) of Oak Ridge Operations. The DNFSB Staff review (July 12-15, 1993) focused on quality assurance at the Y-12 Plant; The DOE QAA (June 21-25, and July 6-15, 1993) evaluated the Oak Ridge Operations Office (OR), Martin Marietta Energy Systems (MMES), MK Ferguson (MKF) and other site operations at Oak Ridge.

This memorandum also describes the status of the Oak Ridge quality assurance program, summarizing key issues identified by the QAA Team, as reported in the Draft "Quality Assurance Assessment of the Oak Ridge Operations, July 1993."

The DNFSB Staff review consisted of interviews with DOE Y-12 Site Office, MMES, and DOE QAA Team personnel; a review of DOE's Quality Assurance Assessment (QAA) Plan; a review of the DOE Draft "Quality Assurance Assessment of the Oak Ridge Operations, July 1993"; and tours of Buildings 9204-2/2E, 9212, 9215, and 9995.

2. **Summary:** The DOE Team which assessed the status of Quality Assurance at Y-12 was qualified and conducted their review in a thorough and acceptable manner. The results of the DOE assessment, along with DNFSB Staff review, indicate that Oak Ridge lacks several elements essential to a successful quality assurance program. Highlights of specific areas of concern to the DNFSB staff review team are described below. (More details are provided in Section 4 of this report.)
  - a. Oak Ridge Operations Office: Previous DOE quality assurance requirements (DOE Order 5700.6B) have not been fully implemented or documented. Implementation of DOE Order 5700.6C is progressing slowly. In fact, OR has only recently (June 1993) issued its implementation plan for DOE Order 5700.6C. The current OR QA Program is deficient in that it lacks:
    1. A comprehensive training system as required by DOE Order 5700.6C, Criterion 2.

2. A system for assuring that important issues and deficiencies are properly reported, tracked, and corrected in accordance with DOE Order 5700.6C, Criterion 3.
  3. A systematic process to address the application of quality assurance to procurement as required by DOE Order 5700.6C, Criterion 7.
  4. A management assessment program as required by DOE Order 5700.6C, Criterion 9.
- b. DOE Y-12 Site Office: The DOE Y-12 Site Office has only recently contracted with the Oak Ridge Institute for Science and Education (ORISE) to develop an implementation plan for DOE Order 5700.6C. The plan is due in December 1993. The DOE Y-12 Site Office quality assurance program is deficient in that it lacks:
1. A Quality Assurance Plan as required by DOE Order 5700.6C, Criterion 1.
  2. A program to ensure that all personnel are trained and qualified as required by DOE Order 5700.6C, Criteria 2 and 10.
  3. A management assessment program as required by DOE Order 5700.6C, Criterion 9.
- c. MMES (Y-12): The MMES Quality Assurance group has recently reorganized, consolidating quality assurance functions among sites at Oak Ridge. As a result, MMES is re-evaluating its implementation of DOE Order 5700.6C. The MMES (Y-12) Quality Assurance Program is deficient in that:
1. Quality Assurance Programs in use at Y-12 do not reflect the current organization structure, responsibilities, levels of authority, and interfaces for those managing, performing, and assessing adequacy of work as required by DOE Order 5700.6C, Criterion 1.
  2. The MMES Y-12 training and qualification program fails to provide adequate controls to ensure its personnel are trained and qualified to perform their jobs as required by DOE Order 5700.6C, Criterion 2.
  3. Items and processes that do not meet established requirements are not always identified, controlled, analyzed for cause, and action taken to prevent recurrence as required by DOE Order 5700.6C, Criterion 3.
  4. Procedures used for some important operations do not provide clear and correct guidance to ensure correct work accomplishment as required by DOE Order 5700.6C, Criterion 5.

5. Procurement controls do not meet the requirements of DOE Order 5700.6C, Criterion 7.
  6. No effective management assessment program has been implemented in either the Enriched Uranium Operations Organization, or the Disassembly and Special Materials Organization, as required by DOE Order 5700.6C, Criterion 9.
- d. MKF: The DOE QAA Team identified weaknesses in management assessment, sharing of lessons learned, occurrence reporting, and training. They concluded that implementation of the program is less than satisfactory.
3. **Background:** The DOE Quality Assurance Assessment was conducted by the Office of Nuclear Energy Self-Assessment (NE-80), with team members from DOE-NE, DP, EM, various operations offices, and support contractors. The DOE QAA Team's objective was to conduct a performance-based inspection which emphasized the evaluation of objective evidence of implementation of Quality Assurance principles and compliance with Department of Energy Orders and standards. The DOE QAA Team observed both DOE and contractor operational activity, reviewed pertinent documents, and conducted interviews at all levels of management, technical staff, and operational staff.

The DOE QAA Plan presents specific performance objectives along with supporting criteria for evaluation. These objectives were originally developed from NQA-1 criteria. However, they have been "upgraded" to incorporate DOE Order 5700.6C requirements, and expanded to include Maintenance and Conduct of Operations. The objectives addressed include:

- Quality Programs (includes training and qualification)
- Procurement and Receiving Assessment Control
- Corrective Actions
- Measuring and Test Equipment
- Design Control
- Identification and Control of Hardware/Materials
- Inspection and Test
- Control of Special Processes
- Handling, Shipping and Storage
- Implementation and Control of Maintenance
- Assessments
- Conduct of Operations

The Quality Assurance Assessment Plan criteria are more comprehensive than those of DOE Order 5700.6C. However, no assessment guidance is provided in the use of established technical standards and administrative controls, and approved instructions and procedures, for work. It should be noted that the QAA Plan criteria were used strictly for guidance to evaluators; Oak Ridge was not necessarily evaluated to all the QAA Plan criteria. It should

also be noted that the DOE QAA Team did not assess the status of the implementation and control of maintenance at Y-12.

#### 4. Discussion:

##### a. OR:

1. There is no comprehensive training program at OR. The technical training organization is part of the Nuclear Safety Division under the OR Assistant Manager for Environment, Safety and Quality, and is woefully understaffed with only one individual assigned. Administrative and technical training depend on other line and staff organizations to provide adequate needs analyses; no controls exist in this area. Also, the QAA Team determined that training records at Oak Ridge are incomplete.
2. There are no coordinated systems for corrective actions or issues management at OR. Issues management is primarily the responsibility of the individual line organizations and these systems vary among the organizations.

Tracking of corrective actions to resolve safety-related findings is inadequate. Some organizations use PC-based tracking systems, while other organizations are using, or plan to use the MMES Action Management System (ESAMS). Office-wide analysis of adverse findings to detect trends is not currently practicable.

Verification of closure of previously identified concerns is typically conducted at the next assessment cycle. Verification of closure may not be timely, given the typical three year time span between major assessments of facilities and programs.

3. A systematic process has not been established to address the application of quality assurance to procurement and to address procurement quality problems which may have common causes.

Procurement quality was identified as a problem area within OR and the contractor organizations during in-briefings of the QAA Team by both contractors and OR personnel. OR Quality and Reliability Division (QRD) personnel are not assigned to monitor procurement programs, nor is it part of their job responsibility.

4. Requirements for periodic management assessment per DOE Order 5700.6C, Criterion 9 to assess the quality assurance program and its performance are specified. However, the results of such assessments are questionable since the organizations reviewed by the DOE QAA team failed to (1) establish and document periodic goals and objectives, (2) define performance measures, and (3) recognize areas in need of performance improvement.

The Acting Assistant Manager for Environment Safety and Quality has just recently reinstated contractor oversight into QRD and Safety and Health Divisions. This oversight activity is still in the planning stages and is not yet implemented.

It should be noted that there is no requirement for line personnel who support the Office of Self-Assessment be trained and qualified in auditing.

b. DOE Y-12 Office:

1. No Quality Assurance Plan has been developed for the Y-12 Site Office as required by DOE Order 5700.6C, Criterion 1.
2. No program exists to ensure that all personnel are trained and qualified as required by DOE Order 5700.6C, Criteria 2 and 10. The most glaring manifestations of this issue are that no formal training or qualification program exists for the DOE Y-12 Facility Representatives or for DOE Y-12 personnel assigned to assess or to verify corrective action. As a result, the effectiveness of Y-12 Site corrective action by the DOE Y-12 Site Office may not always be directly assessed by personnel that are qualified and knowledgeable in the areas assessed as required by DOE Order 5700.6C, Criteria 3 and 10.
3. A management assessment program has not been developed for the DOE Y-12 Site Office.

c. MMES (Y-12):

1. Quality assurance programs in use at Y-12 have not been updated to reflect the current organization, responsibilities and interfaces as required by DOE Order 5700.6C, Criterion 1. The Y-12 Disassembly and Special Materials Organization was reorganized in November 1992, however, their QA Plan has not yet been revised to reflect the new organization.
2. The MMES (Y-12) training program fails to provide adequate controls to ensure that personnel are adequately trained and qualified to perform their jobs in accordance with DOE Order 5700.6C, Criterion 2, and DOE/AL Quality Criteria (QC-1).
  - (a) Personnel performing work that requires special skills are not always qualified in accordance with approved procedures. For example:
    - (1) Special process supervisors in Disassembly and Special materials perform on-the-job training (OJT) and other training without being formally qualified on the process. For example, a supervisor has certified workers for B28 disassembly although his training records do

not indicate that he has attended all required training for B28 disassembly and he is not certified in the process.

- (2) Some Y-12 personnel performing B28 disassembly have not completed all training specified on the training qualification sheet.
  - (3) Some personnel performing B28 disassembly have not been certified to perform disassembly work. Management stated that it was acceptable for a non-certified person to perform disassembly work if a certified person worked with them. Mock-up training is not utilized.
- (b) A qualification program has not been developed for the TQM/QA/Self-assessment Coordinators for Disassembly and Special Materials at Y-12.
  - (c) On-shift operator training, qualification, and documentation is not completed as required by DOE Order 5480.19, Attachment 1, Chapter V.
  - (d) Personnel responsible for oversight and assessment of operations at Y-12 are not always technically qualified and knowledgeable of the areas assessed as required by DOE Order 5700.6C
  - (e) Although responsible for developing QA plans meeting the requirements of DOE Order 5700.6C, some Y-12 QA Coordinators have not been trained on, and are not knowledgeable of, DOE Order 5700.6C. (Some DOE Order 5700.6C training is scheduled for this year.)
  - (f) Although responsible for oversight of assembly and disassembly, the Y-12 Disassembly and Special materials QA coordinator has not attended training on QC-1 or QC-2.
3. The systems in use for nonconforming items do not require engineering disposition, cause determination, action to prevent recurrence, or trend analysis as required by DOE Order 5700.6C, Criterion 3.

Surveillance findings reviewed by the DOE QAA Team were not analyzed for probable cause or had action specified to prevent recurrences.

4. Of the approximately 375 procedures in use in Enriched Uranium Operations, approximately 325 are out of date and do not include all steps needed for successful completion of the process. However, some procedures used for enriched uranium processes have been developed since 1990 and are much improved, including better guidance for operators, flow charts, and Process and Instrumentation Diagrams for initial process lineup.

5. Procurement procedures are scattered throughout the Y-12 organization and are not consolidated in one manual.

A check list is used to determine criticality of application for requisitioning plant equipment. However, the use and processing of this check list has not been proceduralized.

There is no program for procurement and use of commercial grade or "off-the-shelf" items in critical applications.

No receipt inspection program exists for suspect/counterfeit parts in new equipment.

6. No management assessment program exists in either the Enriched Uranium Operations Organization, or the Disassembly and Special Materials Organization. As well, personnel performing surveillances in Uranium Enrichment Operations are not identifying and ensuring correction of problems in equipment and procedures as required by DOE Order 5700.6C, Criterion 3.
- d. MKF: The DOE QAA Team identified weaknesses in management assessment, lessons learned, occurrence reporting, and training and assessed these issues as programs not consistently or completely implemented. The Team concluded that implementation of MKF's quality program is less than satisfactory, needing more management support for resource allocation.