

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 3, 1993

MEMORANDUM: G. W. Cunningham

COPIES: Board Members

FROM: J. T. Arcano, Jr.

SUBJECT: Savannah River Site, Defense Waste Processing Facility Quality Assurance Review, July 6-9, 1993

1. **Purpose:** This memorandum describes the observations of Defense Nuclear Facilities Safety Board (DNFSB) technical staff (T. Arcano, Jr.) and Outside Expert (D. Porter) during a review of the Defense Waste Processing Facility (DWPF) Quality Assurance Program from July 6-9, 1993.
2. **Summary:** The quality assurance program currently implemented at DWPF follows the precepts of American Society of Mechanical Engineers *Quality Assurance Program Requirements for Nuclear Facilities*(NQA-1). Implementation of DOE Order 5700.6C, *Quality Assurance*, is not scheduled until September 30, 1994, as approved by DOE. DWPF is progressing from a DOE Order 5700.6B (NQA-1)-based quality assurance program to one which is DOE Order 5700.6C- based. Major findings of this review of WSRC at DWPF include:
 - a. The effectiveness of the DWPF surveillance and corrective action programs remains to be proven.
 - b. Prior to the DWPF melter flooding event which occurred in April, 1993, a "Stop Work" culture was not-in place. Since the incident, the long-term internalization of this culture at DWPF has not yet been proven.
 - c. Programmatic deficiencies in scheduling, tracking, and deferring of calibration of measuring and test equipment were discovered during a DWPF quality assurance surveillance. The effectiveness of corrective actions in this area remains to be proven.
3. **Background:** The review consisted of briefings by Department of Energy - Savannah River (DOE-SK) and Westinghouse Savannah River Company (WSRC), a review of quality assurance policy directives, personnel interviews, and observation of DWPF control room operations. This review was conducted concurrent with a Training and Qualification Review.
4. **Discussion:**
 - a. The effectiveness of the DWPF surveillance and corrective action programs remains to be proven.
 1. The Type B Accident Investigation Board Report (May 10, 1993) on the DWPF Melter Flooding Event, as well as personnel interviewed, revealed that prior to the incident operations personnel believed that the quality of operations procedures was poor and that operators lacked confidence in these procedures. As well, an Operations Department self-assessment had indicated that a majority of the operations procedures lacked adequate

levels of technical and administrative quality. However, no effective action was taken which prevented operations procedure inadequacies from contributing to the cause of the melter flooding event.

2. The melter flooding event report indicates that "the QA surveillance program is an excellent tool to aid in the identification of program and performance inadequacies. This tool has apparently not been used to observe operations and start up test activities to identify Conduct of Operations deficiencies."
3. As a result of the flooding incident, the surveillance program at DWPF has been expanded to cover the verification and validation of operations procedures. As well, management oversight and QA surveillance of the Design Change Process is being implemented. The effectiveness of these actions remains to be proven.

- b. Prior to the melter flooding event, a "stop work" culture was not in place. Since the event, the long-term internalization of this culture at DWPF has not yet been proven.

DWPF "stop work" procedures (DWPF Quality Assurance Implementing Procedures) allow personnel to stop work if significant conditions exist which are adverse to quality. However, several personnel interviewed indicated that prior to the melter flooding event, schedule adherence was of higher priority. The same personnel also indicated that the event provided the impetus for a new-found culture to stop work when activities are questionable with regard to quality or safety. The long-term internalization of this culture at DWPF remains to be proven.

- c. A recent DWPF quality assurance surveillance revealed that approximately one hundred Category 1 items of installed measuring and test equipment (M&TE) had lapsed calibration certification. A resulting critique identified programmatic deficiencies in scheduling, tracking, and deferring M&TE calibration. The effectiveness of corrective actions taken in this area remains to be proven.
- d. [Appendix A](#) describes the status of DWPF implementation of DOE Order 5700.6C.

Defense Waste Processing Facility Implementation of DOE Order 5700.6C

1. The quality assurance program currently implemented at DWPF follows the precepts of American Society of Mechanical Engineers *Quality Assurance Program Requirements for Nuclear Facilities* (NQA-1). WSRC (sitewide) is progressing from a DOE Order 5700.6B (NQA-1)-based QA program to one which is DOE Order 5700.6C-based. WSRC sitewide implementation of DOE Order 5700.6C *Quality Assurance* is scheduled for September 30, 1994 and precedes commencement of radioactive waste operations at DWPF.
2. WSRC is taking a very measured, phased approach to implementing DOE Order 5700.6C. Phase I of the program has consisted of revising company-level documents via changes to the WSRC Quality Assurance Manual (1Q). DOE-SR considers that all 1Q Manual Copies have been revised in accordance with DOE Order 5700.6C.

During Phase II, 1Q Manual requirements will flow down to DWPF. DWPF will, in turn, revise its procedures which implement its quality assurance program. Phase II will also consist of training for and

implementation of the revised procedures. Phase II for DWPF has not yet been defined, however, the DOE-SR Director of the Quality and Materials Assurance Division indicated that within two months WSRC will generate a Phase II plan which details specific DWPF procedures to be revised, training requirements, and measures of effectiveness in implementing DOE Order 5700.6C.

3. It is not clear whether personnel implementing DOE Order 5700.6C recognize the significant cultural difference between DOE Order 5700.6C (where the responsibility for quality lies with all personnel) and DOE Order 5700.6B (where the responsibility for quality lies with an independent ("Quality Assurance") organization). The WSRC Implementation Plan for DOE Order 5700.6C states that changes to the quality assurance program (from DOE Order 5700.6B) "will be manifested in details to procedures, rather than principle." Several personnel interviewed reflected this same understanding. That is, that implementation of DOE Order 5700.6C merely requires revision of a few procedures, when, in fact, it demands a drastic change in philosophy of operations which requires the active participation of all personnel.
4. Each division under the President of WSRC has a Cognizant Quality Function (CQF) which is responsible for implementing DOE Order 5700.6C within its division. CQF responsibilities include:
 - a. Programmatic - ensuring that documentation is correct
 - b. Evaluation - assessments, inspections, and reviews
 - c. Administrative - tracking nonconformances and Corrective Action Requests, and trending
5. DWPF management has aggressively reacted to conduct of operations deficiencies which were identified during the melter flooding event. Several key management personnel were shifted as a result of the incident. Interviews with the new Operations Manager, the new Engineering Manager, and the new Maintenance Manager indicated that they were proactively setting quality requirements as line managers. The Operations Manager presented his six key initiatives:
 - a. Verification and validation of procedures.
 - b. Using critiques as a corrective action tool.
 - c. Turning around workers lack of confidence in management's ability to resolve problems.
 - d. Staffing 24 hour shift coverage with senior managers.
 - e. Assigning 15 shift advisors from K-Reactor to three shift coverage at DWPF.
 - f. Enforcing procedural compliance and a "stop work" culture.
6. A Total Quality Council (TQC) has been formed to facilitate the development of a "Total Quality" culture at DWPF. However, personnel interviewed were only vaguely aware of the "Total Quality" precepts, though most equated "Total Quality" with doing the job right the first time.