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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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July 5, 1995

Mr. Mark Whitaker, EH-9
Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Whitaker:

Enclosed for your information and distribution are 20 Defense Nuclear Facilities Safety Board staff reports. The reports have been placed in our Public Reading Room.

Sincerely,

A handwritten signature in black ink, appearing to read "G. W. Cunningham".

George W. Cunningham
Technical Director

Enclosures (20)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 17, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Timothy J. Dwyer, Technical Staff

SUBJECT: Training and Qualification Review at the In-Tank Precipitation Facility (ITP), Savannah River Site (SRS)

1. **Purpose:** This memorandum discusses the status of the Training and Qualification Programs at the In-Tank Precipitation Facility (ITP), Savannah River Site (SRS). An initial review of these programs was conducted from October 17-20, 1994 by the Defense Nuclear Facilities Safety Board (Board) staff member Timothy J. Dwyer and outside expert Richard L. Thompson. Subsequent reviews of selected areas requiring further attention were conducted by outside expert Ralph West in November 14-19, 1994, November 30-December 2, 1994, January 9-13, 1995, and March 20-24, 1995.
2. **Summary:**
 - a. The Westinghouse Savannah River Company (WSRC) ITP Training and Qualification Program is comprehensive and well-documented. Interviews of operations and maintenance personnel found them to be generally knowledgeable of required topics, with some weakness noted in the areas of radiological controls and lockouts/tagouts. The records that were reviewed and the interview results demonstrated that the training and qualification programs met the intent of the associated Department of Energy (DOE) Orders.
 - b. Delays in issuing procedures and the recent upgrade of many procedures have impacted the training of operators and supervisors. These new procedures are a marked improvement over previous ones, but some question exists as to the quality of the initial procedure validations (walkdowns) conducted by operations personnel. A process is in place to ensure proper operator/supervisor training prior to startup, and the new procedures will be observed during the DOE Operational Readiness Review (ORR).
 - c. DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities* requires that drills be conducted as part of the continuing training program. Drill guides/scenarios appear well-developed, but drill performance is not well-documented. Lessons learned are not promptly passed from one crew to another, and Quarterly Consolidated Drill Reports have limited utility. Observation of a drill

revealed significant problems with the process of briefing, observing and critiquing the drill such that it was not an effective training evolution. Facility management is making an effort to improve drill performance. This area will also be observed during the DOE ORR.

- d. Engineering division qualification and assignment are less rigorously structured than in the operations or maintenance divisions. Problem resolution for or alterations to a system may be approved by any engineer; authority is not restricted to the cognizant engineer assigned to the system.
3. **Background:** A WSRC review of the ITP training and qualification program in mid-1992 noted numerous problems. Retention of material presented in training was evaluated by written examination and found to be below 50%. ITP procedures, and procedure training were found to be inconsistent and inadequate for operating the facility. Therefore, the program was completely overhauled. A fifth shift of operators was added to allow sufficient training time and the training division staff was expanded substantially. A static simulator was developed to provide more realistic training of control room shift personnel.

The Board staff reviewed the status of training and qualification of operators, supervisors, maintenance, and technical personnel at the ITP facility through discussions with WSRC and DOE-SRS management, reviews of training records, and interviews with facility personnel.

4. **Discussion/Observations:**

a. Training and Qualification Program:

- 1. WSRC: The WSRC ITP Training and Qualification Program is comprehensive and well-documented. A fifth shift operator crew has been established, permitting one week in five to be fully dedicated to training. Needs Analyses, Qualification Standards, Study Guides (system specific), on-the-job training (OJT), and classroom training curricula (including examinations) were developed for all positions. All operations shift staff are subject to OJT evaluations, written examinations and oral boards prior to full qualification. In addition, shift managers/shift supervisors and control room operators undergo oral and written certification examinations and peer team reviews in the static simulator.

Facility specific training includes 68 hours in areas such as System Overview, Safety Envelope, Fire Safety, Conduct of Operations, Configuration Management, Radcon Overview, and Benzene and Nitrogen Awareness. Cognizant engineers received training in Quality Assurance, Conduct of Technical Modifications (permanent and temporary), Design Authority Review, Unresolved Safety Questions, Process Hazard Review, Root Cause Analysis, and Procedure Reviewing. ITP also received

graduates from the High Level Waste Pipeline Fundamentals Training Program as input to its facility-specific training program (eight from the first class, eight from the early 1995 class), although there are no ITP trainees in this program at present. Note, also, that incumbent operators will not receive any fundamentals training until ITP manning is sufficient to allow incumbents to be fed back into the Pipeline Fundamentals Training Program.

Continuing training is planned a year ahead and features two basic paths: (1) incumbent Cycle Training, which includes topics of current interest, and periodic refresher topics necessary to maintain qualifications/proficiencies (e.g., mask-fit); and (2) Initial Tank Operator Training, Initial Process Operator Training, Initial Control Room Operator Training, etc., for those who came out of the Pipeline Fundamentals Training Program. Cycle Training has included repeated emphasis and feedback on the ITP Safety Envelope, including the Safety Analysis Report Addendum 1 (Revision 4), as well as system specific training. Cycle training examinations include review questions to sample knowledge retention.

ITP has developed a static simulator that is a mock-up of the ITP control room, using computer graphics, flip charts, and fixed communications capabilities to simulate in-plant conditions. It has become an important device for team training and procedure walkdowns. One day of each fifth shift training week is dedicated to training in the simulator. Each simulator exercise is video-taped to improve post-exercise critiques. The simulator is also used in the peer evaluations for shift manager/shift supervisor and control room operator certifications. Static simulator training usually involves significant safety envelope and Operational Safety Requirement (OSR) knowledge.

Due to the delay in obtaining the Pipeline Fundamentals Training for incumbent operations personnel (those on board since 1992), a shift technical engineer (STE) is assigned to each shift as a compensatory measure. STE training is standardized across SRS, with additional ITP-specific subjects added. The program was implemented by the training division for the engineering division, and includes comprehensive written examinations and oral boards. Final qualification requires a six hour written fundamentals examination, a shift manager/shift supervisor certification examination, and an oral board chaired by engineering division, with operations and training division participation. However, the STE is not required to gain or maintain any operations qualifications.

The Maintenance Division Training Program is similar to operations division training, though less stringent. Maintenance does not have a fifth shift dedicated to training. Maintenance personnel have received core training in site services, as well as applicable (or slightly modified) portions of the facility specific training package. The

Maintenance Program Qualification Roster identifies Critical Task Qualification listings, as well as qualification and requalification status for each incumbent. A minimum of two qualified maintenance personnel are reportedly on shift for each facility specific task.

Engineering division qualification and assignment are less rigorously structured than in the operations or maintenance divisions. Problem resolution for or alterations to a system may be approved by any engineer; authority is not restricted to the cognizant engineer assigned to the system. No designated alternate cognizant engineer is assigned to ITP systems. In some cases, the STE can act for the cognizant engineer with no specific post-facto notification requirements.

2. DOE-SRS Facility Representatives: The DOE-SRS Facility Representative Program requires that qualification card signatures be obtained from "Qualifying Officials." A list of ITP "Qualifying Officials" was produced, but no guidance or qualifications for becoming a "Qualifying Official" could be identified. DOE-SRS intends to have round-the-clock facility representative coverage during ITP startup; however, given the nature of the ITP process, DOE-SRS was not able to define what activities marked the beginning or the end of "startup."

- b. Level of Knowledge Interviews: Interviews were conducted with 20 operations personnel and 11 maintenance personnel. Supervisor and operator knowledge of the Safety Envelope and OSRs appropriate to their level of qualification was adequate. Although not strong, radiological protection knowledge was as good or better than noted in operator interviews at other facilities in the past. Work control process knowledge was consistently adequate. Lockout/Tagout knowledge was generally adequate among operations personnel, but good among maintenance personnel. Supervisory operations personnel exhibited uniformly higher levels of knowledge throughout the interviews.

Subsequent interviews of five cognizant engineers found that most were knowledgeable about their area of expertise, but most were weak in the overall system theory and operation. None of these engineers knew the expected radiation levels during operations or had considered the effects of radiation on the operation or maintenance of the systems under their cognizance.

- c. Procedure Upgrades: A procedure hierarchy has been established, which includes Integrated Operating Procedures (IOPs), under which System Operating Procedures (SOPs), startup, operate, or shut-down specific systems or equipment; Abnormal Operating Procedures (AOPs); and Emergency Operating Procedures (EOPs), which are supported by one-page Alarm Response Procedures (ARPs). There are also OSR surveillance procedures. New or upgraded procedures have been developed for all of these

categories. However, the sheer volume of procedures has overwhelmed the procedure development process: several personnel reported that the validation process schedule involving operations personnel had required walking down significant numbers of upgraded procedures in a single shift. Additionally, first use reviews of new procedures are only conducted at the discretion of the shift manager, and no guidance is available as to who should be included in the review.

The recent upgrade of many procedures, and their late delivery, has also prevented operator and supervisor training on these documents. However, a process is in place to ensure proper operator/supervisor training prior to startup, and the new procedures will be observed during the DOE ORR.

- d. Drills: Training department drill guides/scenarios appear well-documented and include details for implementation, evaluation, and feedback to improve the guide/scenario. However, operations division drill performance is not well-documented. A Quarterly Consolidated Drill Report collects information from all drills performed during the quarter, but appears to have limited utility. Although either the facility manager or operations manager attends the post drill critique for each drill, lessons learned are not promptly passed from one crew to another. Observation of a drill involving a radioactive leak into the annulus space of a tank revealed significant problems with the process of briefing, observing and critiquing the drill such that it was not an effective training evolution. ITP management is making an effort to improve drill performance. This area will be observed during the DOE ORR.
 - e. Compliance to Standards: A WSRC Readiness Self Assessment (RSA) to verify adherence compliance was conducted in early 1994. A subsequent WSRC review identified additional assessments that needed to be done to meet the requirements of the WSRC SCD-4 Manual, *Operational Readiness Functional Area Requirements*. These assessments were completed in mid-1994. Most deficiencies that were noted during these reviews were corrected, although it was noted that closure of deficiencies from the RSA was allowed prior to *completion* of the specified corrective action, as long as the incomplete activity was entered into the Master Tracking System (MTS). Overall, however, Board staff reviews of maintenance, technical and support staff training found these programs to be satisfactory. The records that were reviewed and the ITP personnel interview results demonstrated that the training and qualification programs met the intent of the DOE Orders.
5. **Future Staff Actions**: Continue to monitor ITP qualification and training program progress. This will be particularly significant during the DOE ORR process.