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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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September 19, 1991

Mr. Victor Stello, Jr.
Deputy Assistant Secretary
for Facilities
Office of Defense Programs
U.S. Department of Energy
Washington, DC 20585

Dear Mr. Stello:

Enclosed for your consideration are observations concerning the programs and facilities of the Nuclear Materials Processing Department of the Savannah River Site (SRS). These observations were made by outside technical experts of the Defense Nuclear Facilities Safety Board, during a visit to SRS that took place from July 22-25, 1991.

We would be pleased to answer any questions or consider any comments you may have on these observations. We plan to schedule another visit to the SRS in two or three months to continue our review of these facilities at this site.

Sincerely,

John T. Conway
Chairman

Enclosure

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Memorandum For: DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Date: August 30, 1991

From: John F. Drain

Subject: Report of Trip to Savannah River Site, 22-25 July 1991

System Planning Corporation (SPC), under Contract DNFSB-89-003, is providing engineering expertise to the Defense Nuclear Facilities Safety Board (the Board). During the period 22-25 July 1991, Mr. John F. Drain and Mr. William L. Frankhouser visited the Savannah River Site (SRS), operated by Westinghouse Savannah River Company (WSRC), to assist the Board and staff members in a review of the WSRC Nuclear Materials Processing Department (NMPD) facilities.

General Comments. The purpose of this visit was to obtain an overview of programs and facilities within NMPD, the division of WSRC that is responsible for production of reactor materials, separation of reactor products, recovery and recycling of Defense Programs material, separation and recovery of nuclear waste, and nuclear waste management.

The NMPD presentations included the following subjects:

- The NMPD Performance Improvement Plan for operations, maintenance and work control
- Training of NMPD and support personnel
- Safety documentation
- Quality assurance.

Tours, additional briefings, demonstrations or observation of evolutions in progress were made at the following facilities:

- NMPD Training
- F-Canyon separation and recovery process
- FB-Line plutonium process
- HB-Line processing (Pu recovery, Np/Pu-239 processing, PU-238 processing)
- Tritium processing.

The remaining paragraphs of this report reflect the impressions of the Board's outside experts from their observations on this trip.

Performance Improvement Plan (PIP). A briefing was provided on the PIP for the NMPD. The PIP is WSRC's way of implementing the general performance upgrade and adaptation of industry standards (and compliance with DOE Orders) at SRS. Typical of the reference documents cited are INPO 85-017 (Rev 1), "Guidelines for the Conduct of Operations at Nuclear Power Plants" and DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities." Similar pairings were referenced for maintenance practices, for selection, training, and qualification of operators, and for accreditation of training programs.

The translation of philosophy into policy and the execution of the whole program took on the flavor of new titles for old jobs and the creation of performance indicators. Some 73 procedures were described as required to implement programs in training, conduct of operations, conduct of technical support, conduct of maintenance and organization and administration. To date, 47 of the 73 procedures have been prepared, with conduct of technical support being the closest to completed. These "procedures" are really generalized policy documents, not process or operating procedures. Completion of the PIP in the five areas noted varies from 1992 through mid-1997.

Training. There is a centralized training organization for all of NMPD, analogous to the Reactor Training and Procedures Department (RTAP) in the reactors area. Separate training managers are designated for each of seven program teams within NMPD: waste processing, waste management, environmental restoration, raw materials, separations, tritium, and maintenance. The training organization has a staff of 260 people, about 3/4 of whom are professionals, and 2/3 of whom are WSRC employees. It was apparent during the presentation that the training staff had been sensitized to the elements of the Board's Recommendation 90-1. A considerable effort had been made to apply the techniques espoused in the INPO guidelines and some of the lessons learned by RTAP in their training program development. For example, a reading comprehension exam had been administered, and a remediation program established. The briefing was wide-ranging, well prepared and was backed up with selected copies of program products such as typical written exams, job tasks analyses, etc. However, a few remarks regarding program policies, such as "...verbatim compliance with procedures", raise some doubt about whether the execution of the program matches the quality of the briefing. During a future visit a better assessment of the training will be scheduled.

Quality Assurance. The briefing on QA provided an historical overview as well as some detail of the current organization. Suffice it to say that the current QA plan was implemented after WSRC became the operating and managing contractor in 1989, and the QA Manual for the site was issued in April 1990. Implementation of the QA Manual within NMPD is about 80 percent completed.

The most contentious part of the briefing and dialogue that followed was the organization for QA at SRS; the interrelationships of the NMPD QA organizations as described with the Environment Safety, Health, and Quality Assurance Division's (ESH&QA) quality assurance functions. The Board's representatives were not satisfied that the degree of independence implicit in the NMPD Program QA functions was equivalent to that required by NQA-1 or the DOE

Order, nor was it clear to them how the Program QA groups related to the ESH&QA quality assurance group. Within NMPD, a QA organization has been established within each of the major technical programs (separations, reactor materials, DWPF, waste management, and tritium). Each of these QA organizations reports to the program manager for that technical activity. Thus, these QA organizations report at two levels below the NMPD vice president, and four levels below the President of WSRC.

With other SRS divisions organized in the same manner for administration of the QA program, eleven QA organizations report at one or two levels below the divisional vice presidents. However, the Vice President and General Manager of ESH&QA reports at the same level as the divisional vice presidents. This ESH&QA organization is represented as being a matrix function across the entire site through which all other QA organizations are coordinated via a dotted line mode, essentially to establish uniformity throughout all QA activities. The WSRC managers present strongly defended this structure, and assured the Board's representatives that it provided for effective and independent QA functions.

The organizational arrangement with eleven QA "line" functions and an overlapping matrix "coordinating" function is unique for nuclear facilities. The single QA manual and monthly management meetings to achieve operational uniformity in QA throughout SRS are at best wishful thinking and not practical. With QA organizations reporting to technical program (or "plant") managers rather than to the site manager, or even at the vice presidential level, organizational freedom from the managers whose operations and products are being monitored is not credible. By comparison, at the Westinghouse Commercial Nuclear fuel plant, the QA organization reports to the site manager. In NQA-1, organizational freedom of QA is required:

> ...Such persons and organizations [QA] shall have direct access to responsible management at a level where appropriate action can be effected. Such persons or organizations shall report to a management level such that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations...

A similar requirement is stated in the SRS QA Manual (1-Q). No assessment of the working QA program was feasible during this visit, but such an assessment should be a priority item for a future visit.

Specific Areas of Concerns. In the course of facility tours, several areas were noted of concern. Some may warrant near-term follow-up.

(a) Handling of Pu metal. Pu metal is processed in all NMPD gloveboxes in an air atmosphere. Because of the pyrophoric nature of Pu, and the difficulty in extinguishing combustion once started, the selection of an air atmosphere could be a cause for concern in some process steps. Although Halon is available to extinguish a fire, it may not be satisfactory to terminate Pu combustion. At Rocky Flats and commercial facilities processing Pu metal, a nitrogen atmosphere is used in some gloveboxes where the process involved raises the fire potential. Has SRS considered similarities and differences to evaluate the glovebox atmosphere?

(b) Material Accountability and Control. Evidence of Nuclear Material Accountability and Control (NMC&A) was not readily apparent in the several facilities visited. By comparison, it was hard not to see elements of NMC&A in buildings at Rocky Flats.

In at least one of the HB processing lines, NMPD personnel stated that special nuclear material (SNM) is moved not only within Material Balance Areas (MBAs) by operators but also between MBAs by operators. The statement was made that NMC&A personnel were not involved in such movements.

The primary control scheme in use is limitations on quantities and physical requirements. Another statement was made that records of these movements were made manually rather than by computer. Manual logging of SNM movements and inventories, depending on the frequency of making materials balances, may result in days or weeks elapsing before data are properly analyzed by NMC&A personnel.

The Board may desire to look closely at these practices during a future visit to determine if they are effectively performed.

(c) Radiological Protection and Conduct of Operations. In the tours of the several facilities made during this visit, protective clothing (PC) required for entering a Radiological Controlled Area (RCA) ranged from "none" to "gloves, a lab coat, and shoe covers". The RCA postings gave no indication of hazard that would support these extremes in PC requirements or justify the limited effectiveness of any of what was prescribed. It was also possible for one to leave an RCA and enter a non-RCA (operating space) totally contained within the RCA. The transition between areas did not meet requirements for good radon practices. In some instances HP Inspectors monitored the Board's team when leaving the RCA completely, but these excursions into "internal non-RCA areas" did not require the same degree of monitoring even though we were in the same building (and same RCA). The nearly random nature of these requirements and practices fosters an undesirable conduct of operations atmosphere.

Radiological Protection, Conduct of Operations and Training appear to be inseparable issues at NMPD warranting further review in future visits.