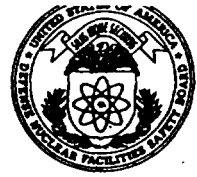


John T. Conway, Chairman  
A.J. Eggenberger, Vice Chairman  
Edson G. Case  
John W. Crawford, Jr.  
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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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July 7, 1992

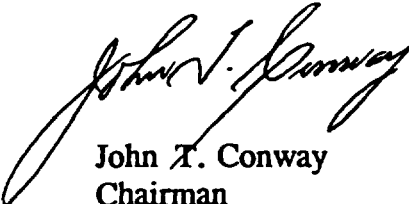
The Honorable Richard A. Claytor  
Assistant Secretary for  
Defense Programs  
U.S. Department of Energy  
Washington, D.C. 20585

Dear Mr. Claytor:

Enclosed for your consideration and action, where appropriate, are a number of observations concerning implementation of a quality assurance program in non-reactor facilities at Savannah River Site (SRS). These observations were developed by our technical staff and outside experts during briefings, discussions and interviews with Department of Energy (DOE) and contractor personnel at SRS from April 28 - May 1, 1992.

If you need further information, please let me know.

Sincerely,



John T. Conway  
Chairman

Enclosure:

Savannah River Site Trip Report: April 28 - May 1, 1992

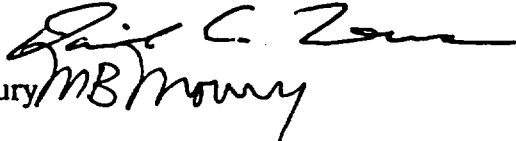
DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 18, 1992

MEMORANDUM FOR Board Members  
G. W. Cunningham, Technical Director

FROM:

David Lowe  
Matthew Moury



SUBJECT: Savannah River Site Trip Report: April 28 - May 1, 1992

1. **Background** - From April 28 to May 1, representatives of the Defense Nuclear Facilities Safety Board (DNFSB) conducted a site visit to the Savannah River Site to review the Non-Reactor Quality Assurance (QA) program. DNFSB Technical Staff included David Lowe (team leader) and Matthew Moury, and outside experts Keith Magnus, Richard Thompson and Doug Volgenau. Primary focus of the technical staff review teams in the past has been the Reactor Quality Assurance program. This was the first review of Separations and Waste Management QA and the second review of the site procurement function. The review focused on select high impact areas in the QA program to develop a "snapshot" of its effectiveness. Major areas reviewed were QA organization, records management, inspector and auditor training and qualification, and site procurement.

2. **Summary** - The Savannah River Site has made progress in implementing a QA program, but they still have a long way to go. More emphasis needs to be placed on verifying compliance in execution of the QA requirements and less on the paperwork governing implementation. In addition, specific areas of concern to the review team include:

- No means of assessing the effectiveness of the QA program other than the number of audits and surveillances performed. No meaningful performance indicators to trend QA improvement. Since QA award fee measures are principally based on the number of procedures written, number of audits, etc., DOE appears to be perpetuating this problem.
- Limited awareness of the potential problems associated with substitution of commercial grade materials for nuclear grade materials.
- No QA program for procurement or control of high impact software. This appears to be a site-wide problem as evidenced by several recent software problems at SRS.
- For all controlled material in the stock system that existed prior to WSRC becoming the M&O contractor, there is no method for assuring the quality of issued repair parts to non-reactor facilities.

3. **Observations** - A great deal of work is being done to incorporate a QA program into the SRS operating philosophy. Because the primary focus of the effort has been on developing and implementing procedures, where there were essentially none in the past, it is not surprising that the program is primarily one of procedures. Little work has been done to evaluate the effectiveness of the program. There still are many deficiencies to correct, but WSRC is systematically attempting to change the direction of the site. The most significant challenge faced is ensuring that operators and workers at the facility level embrace the use of QA in their daily operations.

The DNFSB review team identified several deficiencies in both WSRC and DOE-SR QA programs. The following paragraphs discuss the areas covered by the review.

a. **Site QA History:** DOE Order 5700.6B, *Quality Assurance*, dated September 23, 1986 and SR Order 5700.6C dated February 2, 1987 required the implementation of a QA program at Savannah River Site (SRS) based on the national consensus standard ASME NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities*. A comprehensive QA program that fully implemented the eighteen basic requirements in ASME NQA-1 was never developed under the prior contractor. The current Quality Assurance Plan was implemented by Westinghouse Savannah River Corporation (WSRC) after they became the managing and operating (M&O) contractor in 1989. The original QA manual for the site was WSRC-1-05 dated April 25, 1989, and was superseded by the WSRC-1Q manual dated April 1, 1990 which is the current governing document for WSRC. DOE issued DOE Order 5700.6C, *Quality Assurance*, on August 21, 1991 which expands on the NQA-1 criteria and mandates a 10 element approach, placing additional emphasis on performance and assessments. DOE Savannah River Field Office (DOE-SR) has revised their field QA Manual, previously based on the 18 NQA-1 elements, by updating the previous 18 chapters and preparing a new chapter on Quality Improvement. WSRC has submitted a QA Management Plan as required by the new DOE Order 5700.6C, but has not been tasked to implement the plan.

b. **DOE-SR Quality Assurance:** The DOE-SR oversight of the WSRC QA program is a rather new effort and consists primarily of reviewing how the requirements are implemented on paper and their programmatic aspects. The Quality Programs Division (QPD) under the Office of Environment, Safety, Health and Quality Programs (OESH&Q) is responsible for the programmatic aspects of the QA program and development of DOE-SR QA procedures with each Division being responsible for the actual implementation and assessment of the WSRC QA program in their area. There is no individual below the level of the DOE-SR Manager who takes responsibility for the overall performance of the QA program at SRS. Assessments of DOE-SR QA are to be conducted by the newly formed Performance Assurance function which is not yet staffed, and as a result little if any review of the program in practice is currently done. Requests from DOE-SR line organizations for matrix support from the DOE-SR Quality Programs Officer in performance of assessments far exceeds their ability to support the requests. The primary means of assessing the WSRC QA program and making Award Fees is based on how many procedures, surveillance, and audits have been completed. DOE-SR and WSRC have

been unsuccessful to date in developing meaningful performance measures for quantifying QA effectiveness and continued improvement as required by DOE Order 5700.6C.

c. **WSRC Quality Assurance Organization:** Although, the WSRC QA program appears well founded and structured, its implementation is inadequate with many of its provisions having been only recently initiated such that the true effectiveness of the program is difficult to measure. DOE-SR, through the award fee process, tasked WSRC to conduct "critical self assessments" of their implementation of a QA program. A review of some of the Separations "critical self assessments" revealed that they were superficial and tended to praise their efforts instead of critically probing and evaluating them. It was apparent, through discussions, that many WSRC personnel did not understand what a "critical self assessment" was supposed to be, or for that matter, perceive the need for such assessments. It was also not clear what actions, if any, DOE-SR has taken to turn these assessments into useful management tools.

d. **Records Management:** The Records Management program at Savannah River Site has also been the subject of a major upgrade effort since April 1989. The previous contractor did not have an effective means for capturing records and assuring a retrieval of configuration documentation that would support the many disciplines at the site. DOE tasked WSRC to inventory and manage all active records, as mandated by DOE Order 1324.2A, *Records Management*, and National Archives directives, by October 1993 and to inventory all other records (approximately 13,000 boxes) with unclassified storage to ASME NQA-1 by October 1995. WSRC has dedicated some 310 full time positions to this task. Over 600 other people have received some training in records management to support the 284 WSRC Record Management Centers and some 55 DOE Record Management Centers. Records management has now asked QA for assistance in assessing their efforts. It is a manpower intensive, expensive, and time consuming operation. Although some improvements have been made and a changing attitude toward records management is occurring, the following observations were noted:

- About 9000 boxes of old records are stored at a site located on the Savannah River side of the levee. Concern for this seemed negligible at best.
- WSRC did not know which organization/facilities are, or are not, in compliance with records management requirements.

e. **QA Inspector Training and Qualification:** The QA Inspector Training and Qualification Program is in place. The two Level 3 inspectors who administer the training and certification program are very knowledgeable and have implemented a sound system, based on the requirements of NQA-1, for assuring proficiency and recertification for all QA inspectors. The following observations are provided:

- Interviews with Level 2 and Level 1 inspectors indicated general weaknesses in the areas of stop work procedures and a lack of understanding of proficiency requirements.

- Despite the proliferation of software across the site, including Level 1 software, there are no QA inspectors qualified to inspect any aspect of software control, nor is there a program in place to develop such a capability in the near future. This requirement is defined in ASME NQA-2 Section 2.7, *Quality Assurance Requirements of Computer Software for Nuclear Facility Applications*, and documents the requirements for the "development, procurement, maintenance, and use of computer software, as applied to the design, construction, operation, modification, repair, and maintenance of nuclear facilities".

f. **Auditor and Lead Auditor Training and Qualifications:** The QA Auditor Program is not nearly as well documented and administered as the QA Inspector Program. Reliance on subcontract help has been the mainstay. The Auditor/Lead Auditor Upgrade Program was initiated in March 1992. WSRC appears to have recognized the shortcomings of the program and is taking steps to correct them.

The DOE-SR lead auditor program is even less defined. There are only two qualified lead auditors in the QA Division and less than twelve qualified site wide. DOE-SR is relying on support contractors to supplement their lead auditor requirements. There is no defined plan for qualifying additional DOE-SR lead auditors.

g. **Maintenance Records:** Several completed corrective and preventive maintenance records were reviewed for FB-Line and H-Canyon. H-Canyon has transitioned to a new Integrated Work Control Program and the maintenance records appeared to be complete. The FB-Line has not yet transitioned to this new program and several deficiencies were noted. The major deficiency and concern was that some preventive maintenance items, although indicated as having been completed, had either not been completed or had been only partially completed. The lack of adequate technical reviews of the work package prior to authorizing and after completion of the work was probably a contributing factor to this situation.

h. **Site Procurement:** The previous contractor basically used their corporate commercial procurement system which was largely based on a sole-source preferred contracting practice. There was little regard for Federal Acquisition Regulations and little competitive buying. WSRC was tasked to convert the site procurement system to a Federal-based system with competitive procurement emphasis. This has been a major culture change for the site. DOE has used Award Fee leverage to help motivate the change and WSRC has responded positively, for example: appropriate personnel resources are now on board; requisitioning has been shifted from a very decentralized practice to concentrated and centralized requisitioning, warehousing and stocking system; and Quality Assurance is now being applied toward procurement. The program averages about 1500 requisitions a day and in 1991 procured 1.3 billion dollars of goods and services. Other positive results are: material traceability and shelf-life management has improved; ordering by material specifications has been implemented and is improving; and competitive buying is up to about 60 percent. All of this effort has been intensive and expensive. Overall, the procurement cycle time of repair parts has been lengthened and frustration is a major factor for some users. Many historical sources are no longer available and

the competitive bidding approach is time consuming for the development of new supplier sources, and for the advertising, bid, evaluation and award process that is required for adherence to the new procurement practices. The Procurement Division is very proud of their accomplishments since the April 1989 start of the transition. What they have accomplished is in fact a major upgrade and is not unique, but is rather the introduction and implementation of a well practiced system into a new society of users resulting in a major change in the way of doing business. Despite the massive effort and progress there are several areas that were of concern to the review team:

- There is no method to assure the pedigree of controlled material that has been in the stock system for more than two years. Since April 1989, WSRC has been performing receipt inspections of controlled material thereby ensuring a certain degree of traceability. Not all material that existed in the system prior to April 1989 receives the same level of inspection and documentation. For all controlled material currently issued to Reactors, if the receipt inspection was not done by WSRC, it is reinspected to the quality standards that are currently being used. Since this is not the case for the non-reactor facilities on site, there is no assurance that the material being installed meets the quality requirements specified in the design documentation. Although the quality of the installed equipment at many of the facilities is unknown, it appears rather shortsighted to perpetuate this condition considering the potential impact on public health and safety that failure of a critical component could cause.
- When asked about suppliers substituting commercial grade for nuclear grade materials, it was stated that "we're just starting to get experience in this area". This was a somewhat surprising response in that this has been a serious problem in the commercial nuclear industry for over two years. The Electric Power Research Institute (EPRI) issued an Nuclear Regulatory Commission (NRC) approved report in June 1988 entitled "Guidelines for the Utilization of Commercial Grade items in Nuclear Safety Related Applications", NCIG-07.
- As mentioned earlier there is no QA control over software and this also applies to software procurement. All Level 1 suppliers are required to be audited by WSRC to ensure they have a QA program that meets the requirements of NQA-1 prior to any procurement. Although, this program was reviewed and appears well documented and complete for routine procurements, there is no method for evaluating Level 1 software suppliers even though WSRC is in the process of procuring such software.