

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

September 30, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: A. De La Paz

SUBJECT: Report on Review of M-Area Unirradiated Fuel Facility - Savannah River Site

1. **Purpose:** This report documents a review and tour of M-Area at the Savannah River Site by Defense Nuclear Facilities Safety Board (DNFSB) staff A. De La Paz and J. Schapira. This review was conducted on September 22, 1994.
2. **Summary:** The Justification for Continued Operation (JCO) of the M-Area facilities has been submitted by Westinghouse Savannah River Company (WSRC) to the DOE Savannah River Operations Office (DOE-SR) for approval. DOE stated that review and approval of the JCO is being expedited due to the limited mission of the facility. Other previous DNFSB staff concerns have been addressed.
3. **Background:** The DNFSB staff conducted walkthroughs of the M-Area facilities, primarily Building 321-M, on several occasions. These include walkthroughs on March 5, 1994; on March 31, 1994; and during an in-depth review conducted on April 19-21, 1994. As a result of the April 1994 DNFSB staff review, several areas of concern were identified including:
 - 1) control of fissile material storage in Building 321-M; 2) slow progress in DOE approval of a JCO document for the M-Area; 3) identification and quantification of Building 321-M natural phenomenon-induced criticality events; 4) verification of emergency actions in response to natural disasters; and 5) radiological work practices in Building 321-M.
4. **Discussion/Observations:**
 - a. Status of the M-Area Justification for Continued Operation: The revised JCO for the M-Area was approved by WSRC and sent to DOE-SR on September 12, 1994. A DOE-SR representative stated that the DOE-SR review should be completed in early October, after which the JCO will be forwarded to the DOE Office of Defense Programs for approval. A DOE Headquarters representative stated that they have started their review of the JCO and expect to complete their review by the end of October. The JCO was originally submitted by WSRC to DOE for approval in June 1993.

- b. Natural Phenomenon-Induced Criticality Scenarios: WSRC, as part of the JCO, has finalized a set of natural phenomenon-induced nuclear criticality event scenarios. The initiating events that were considered include tornado, earthquake, and high winds. The event locations include fuel tube storage, the tube cleaning room (currently not in operation), the No. 10 Can Storage Rack in the Casting Area, the Scrap Storage Rack, and the Core Storage Area. A WSRC "Blue Ribbon" Panel, comprised of senior WSRC risk assessment personnel, reviewed the scenarios in detail. The Panel's review was thorough and resulted in redefining the limiting accident scenario for Building 321-M. The DNFSB staff also reviewed the postulated scenarios and their associated frequencies. Generally, the scenarios appeared to be bounding, although no uncertainty evaluations were provided for the individual frequencies which were utilized. The DNFSB staff noted that, as part of the analysis, WSRC recognized Building 321-M deficiencies (replacement facility roof which was not designed for high winds) and took other positive actions (limiting tube dolly usage and defining emergency response actions to isolate Building 321-M water sources).
- c. Assumed Fission Yield: The DNFSB staff agrees with the assumed fission yield of 5×10^{17} fissions for natural phenomenon-induced nuclear criticality events.
- d. Control of Nuclear Material Storage Locations: In the past, the DNFSB staff has expressed concerns regarding the number of fuel tubes which were stored on tube dollies. WSRC has determined that ten dollies, modified to limit the storage capacity to hold four fuel tubes each, can meet the processing requirements in Building 321-M. The remaining dollies have been removed from Building 321-M and have been decertified for use in tube handling. WSRC also stated that they plan to scrap most of these decertified dollies and establish a target date to complete scrapping of these extra dollies.

During the DNFSB staff tour of Building 321-M, a wall rack certified (the Nuclear Safety Emblem (NSE) certification sticker was still on the rack) for fissile material storage was identified in the machine room of the casting area which WSRC stated was no longer used. To prevent the possible storage of fissile material on the rack, WSRC plans to remove the NSE sticker and later, the rack itself.

- e. Emergency Actions to Secure Building 321-M Water Sources: The natural phenomenon-induced criticality event scenarios which have been postulated (see 4.b. above) include the assumption that water supplies to Building 321-M can be secured within one hour of the initiation of these accidents. To verify this assumption, WSRC has conducted three emergency response drills since April 1994. The drills identified a number of deficiencies in the area emergency response plans which WSRC is correcting. Generally, WSRC verified the assumption that water sources to Building 321-M could be isolated within one hour. To enhance area emergency team response and to answer DNFSB staff questions,

WSRC plans to issue a M-Area building priority list and to verify the operability of all water isolation valves.

- f. Building 321-M Radiological Control Practices: Radiological control practices and earlier deficiencies were discussed. WSRC has corrected earlier problems by appropriately modifying dressing and undressing instructions and step-off pads. No other deficiencies were noted during the DNFSB staff tour of the casting area.
5. **Future Staff Actions:** The DNFSB staff plans to continue to follow the JCO DOE approval process. Also, walkthroughs are planned on a periodic basis.