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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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December 31, 2002

The Honorable Everet H. Beckner  
Deputy Administrator for Defense Programs  
National Nuclear Security Administration  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0104

Dear Dr. Beckner:

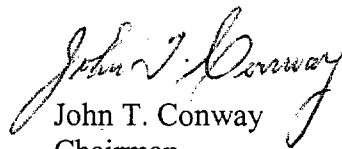
The Defense Nuclear Facilities Safety Board (Board) has reviewed the National Nuclear Security Administration's (NNSA) September 17, 2002, *Response to the Defense Nuclear Facilities Safety Board May 20, 2002, Letter on Inactive Actinide Materials*. The report responds to six specific issues associated with the safe management and disposition of inactive actinide nuclear materials, identified by the Board in its letter of May 20, 2002. The response outlined the preliminary status of inactive materials and identified the strategy by which NNSA will take further action on these issues. The NNSA response also commits to provide by January 31, 2003, additional information regarding disposition planning, evaluation of the continuing need for materials and sealed source disposition.

NNSA has not been dealing effectively with its growing backlog of nuclear materials. Many of these materials may pose substantial safety risks in their present form and storage state. Some are highly radioactive or chemically reactive, requiring stabilization for continued storage. The Board is pleased that NNSA agrees on the importance of addressing the issues identified in the Board's letter and on the need to improve its management of nuclear materials. The Board is also encouraged by the recent establishment of the Inactive Actinides Working Group (IAWG) to address issues related to inactive actinides.

However, the Board finds NNSA's initial response inadequate in some areas. The plan is lacking with regard to several key activities, which require further attention. The most pressing of these activities relate to characterization of materials for storage or disposition; identification of in-scope materials; and analysis and upgrading, where appropriate, of packaging and storage facility conditions. The Board has several suggestions—provided in the enclosure to this letter—to improve the quality of NNSA's response. The specific elements of the response that merit more definitive development should be addressed in the anticipated January 31, 2003, follow-up report, addressing the strategy for developing an integrated approach to the management of nuclear materials for the weapons complex.

The Board recognizes that technological solutions for unique problems posed by some of these materials can be difficult and time-consuming. In addition, other essential plans remain to be developed, particularly those that cross boundaries of responsibility between sites and program secretarial offices. The Board expects that any comprehensive path forward on inactive materials will include a requirement for stabilization and safe storage of all materials, a listing of activities needed to accomplish program objectives, and milestones for completing such activities. The Board will review the January follow-up report carefully to ensure that actions are completed with appropriate urgency. The Board considers accomplishment of activities associated with stabilization of inactive materials to be an integral part of NNSA's near-term mission.

Sincerely,

  
John T. Conway  
Chairman

c: The Honorable Jessie Hill Roberson  
Mr. Mark B. Whitaker, Jr.

Enclosure

## Enclosure

**Inactive Actinide Materials at  
National Nuclear Security Administration Sites**

| <b>Issue/Section/Page(s)</b><br>NNSA September 17, 2002,<br>Response to the Board's<br>May 20, 2002, Letter | <b>Defense Nuclear Facilities Safety Board's<br/>           Staff Comments</b>  |
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| <b>Materials</b><br>Section 5.0<br>Page 7   | <p>The response states that materials categorized as "active" but having no potential future use were considered within the scope of the National Nuclear Security Administration (NNSA) response. Although not specifically included in the Defense Nuclear Facilities Safety Board's (Board) letter, the Board's staff believes this approach is appropriate. More details need to be provided, however, on how it was determined which materials fell into this category and what particular items are involved. Did specific guidance to the sites support this determination? What are the plans for periodic justification for, or reclassification of, these types of materials?</p> |
| <b>Out-of-Scope Items</b><br>Section 5.0<br>Page 8  | <p>The Board would like to see a list of inactive actinide items that are not considered to be within the scope of the Board's letter (e.g., canned subassemblies). The only items at the Pantex Plant that the NNSA response appears to capture within its scope, for example, are the radioisotopic thermoelectric generators. Other items, such as actinide materials from inactive weapon programs, other than pits and CSAs, should have been included within the scope of the response but are not mentioned.</p>   |

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| <b>Characterization</b><br>Section 7.1<br>Pages 9-10  | <p>Table 7.1 is largely meaningless without an independent assessment of the ratings for accuracy and consistency. The staff disagrees with the assertions by Los Alamos National Laboratory (LANL) and Lawrence Livermore National Laboratory (LLNL), in particular, that their characterization for storage warrants "high" confidence. The staff found evidence at numerous sites that characterization data are incomplete or incorrect. For example, the staff was told in October 2001 that LLNL stored no pyrophoric material in its vaults. Two months later, 130 containers of pyrophoric uranium chips were discovered. In Building 9201-5 at the Y-12 National Security Complex (Y12), two drums of unknown legacy material were recently discovered. Also, statements such as "LANL has less than 500 items characterized only for isotope and form, the minimum information needed for safe storage" are highly suspect and technically unfounded. Much of the characterization data at the sites is decades old and potentially unreliable, and thus needs to be validated. The response states that sites currently have sufficient capability and resources to perform characterization for storage, but leaves unstated how these resources will be used to improve understanding of stored inactive materials. The NNSA response notes that additional characterization is needed, but does not identify a path forward for ensuring that all materials are appropriately evaluated. A path forward for verifying and validating characterization data for items expected to remain in storage at the sites is necessary. An effort needs to be made to characterize material for both storage and disposition to the extent practicable, as there is significant overlap in the knowledge necessary to safely satisfy these two end states.</p> |
| <b>Packaging and Storage</b><br>Section 7.3<br>Pages 12-13  | <p>NNSA appears to have missed two important elements in assessing the adequacy of storage systems. Much of the response focuses solely on storage capacity issues and fails to address weaknesses in containers/packaging and storage locations. LANL has material stored in slip-lid cans and solutions in aged plastic bottles. LLNL has nuclear materials stored in glass, cardboard, and plastic containers. Storage locations at these laboratories include freezers, shelves, trailers, and safes, all potentially unacceptable repositories for interim or long-term storage. Also, packaging records are incomplete for some material stored in the Building 251 tube vaults at LLNL. Y-12 houses uranium in many different types of containers and facilities in advanced stages of degradation. The NNSA response does not identify any needs or path forward on the issue of packaging and storage. The response needs to address the path forward for addressing packaging and storage location issues, with capacity concerns being a consideration in choosing among storage options.</p>   |

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| <b>Long-Term<br/>           Storage Facilities</b><br>Section 7.4A<br>Pages 14-18                           | For those materials for which sites/facilities for long-term storage have not been identified, no path forward on the process for making this determination has been presented. What protocol is NNSA implementing to define and analyze potential storage facilities, and what is the timetable for these studies to be completed?   |
| <b>Shipping Containers</b><br>Section 7.4B<br>Pages 18-19   | There is no path forward for closure of issues associated with the certification and availability of shipping containers. The Board requested a plan for ensuring that shipping containers will be available when needed. It appears that the Defense Programs Packaging Report now under development may provide the necessary information when completed, but some of the site information needed for the analyses to support the report is not currently available. A path forward to support completion of the report needs to be provided.   |
| <b>Potential Future Use</b><br>Section 7.5<br>Pages 19-22   | NNSA has not responded adequately to this issue. In addition to identifying a more consistent approach for material retention, NNSA's path forward needs to ensure uniform implementation of the requirement in the Department of Energy's Order 5660.1B, <i>Management of Nuclear Materials</i> , to document the rationale for continued storage of inactive usable (i.e., held for potential future use) materials. Neither LANL or LLNL (and probably other sites) currently documents justification for the retention of inactive items. LANL comments that it justifies and documents retention of its <i>active</i> inventory, but says nothing about its materials that are inactive, or of potential programmatic use. |