

[DNFSB LETTERHEAD]

November 26, 1996

The Honorable Thomas P. Grumbly
Under Secretary of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Mr. Grumbly:

During the past year, the Defense Nuclear Facilities Safety Board (Board) has reviewed the progress of the Department of Energy (DOE) and its contractor, Lockheed Martin Energy Systems (LMES), regarding Board Recommendation 95-1, *Improved Safety of Cylinders Containing Depleted Uranium*. The Board is pleased to note the continued commitment of DOE and LMES to aggressive action and use of a systems engineering approach in addressing the problems with storage of the vast DOE inventory of cylinders containing depleted uranium hexafluoride.

In particular, the Board notes the significant actions taken by DOE and LMES during the past year to slow the degradation of cylinders from external corrosion, as discussed in Recommendation 95-1. DOE and LMES have made substantial progress in the following areas: completing removal of cylinders from direct ground contact, painting the areas of cylinders most vulnerable to corrosion, completing design and construction of several new and improved cylinder storage yards, and establishing a pilot program at the Paducah Gaseous Diffusion Plant to demonstrate a method for recoating entire cylinders (more than 1,000 cylinders have been recoated under this pilot program).

DOE has also submitted four key technical documents describing requirements and plans for upgrading the overall cylinder storage program at the Paducah, Portsmouth, and Oak Ridge K-25 sites using a systems engineering approach. The Board notes that these documents have generally been of high quality. There are, however, certain areas of action under DOE's Implementation Plan responding to Recommendation 95-1 and the associated technical report, *Integrity of Uranium Hexafluoride Cylinders* (DNFSB/TECH-4), that may merit further attention. These areas are addressed in the enclosure to this letter. The Board requests that it be informed of further actions taken in these areas.

The actions of DOE and LMES indicate an understanding of the intent of Recommendation 95-1, wherein the Board discussed the need to initiate "an early start to remedial action" to avoid the potential for dispersal of large amounts of uranium hexafluoride to the environment in the future. While significant action has been taken, much still remains to be done, including establishing cylinder coating programs to recoat cylinders in storage at all three sites. Continued diligent effort on DOE's part will be required to maintain the momentum established thus far.

The Board looks forward to continued progress in the implementation of Recommendation 95-1.

Sincerely,

John T. Conway
Chairman

c: Dr. Terry R. Lash
Mr. Mark B. Whitaker, Jr.
Mr. James C. Hall

Enclosure

Enclosure

Comments on Systems Engineering Documents for Upgrade of the Overall Cylinder Storage Program

Background. Per the Implementation Plan for Recommendation 95-1, DOE has submitted four documents that provide the requirements and planned actions for upgrading the cylinder storage program at the Paducah, Portsmouth, and Oak Ridge K-25 sites:

- A System Requirements Document (SRD) containing governing requirements.
- A Systems Engineering Management Plan (SEMP) containing actions necessary to meet the SRD requirements.
- A Program Management Plan (PMP) and an Engineering Development Plan (EDP) that both provide for scheduling and executing SEMP actions by incorporating them into the program Work Breakdown Structure (WBS) and Work Control Structure (WCS).

Cylinder Pedigree. The SRD, Revision 2, and the SEMP still do not clearly address the Board's comment on cylinder pedigree in its letter of January 22, 1996, which addressed manufacturing standards used for a defined population of cylinders.

Reduction of Cylinder Wetness and Degradation. A key requirement in the SRD, Revision 2, is requirement 5.2.2.c, stating, "As part of continuous improvement, other methods for reducing time of wetness and cylinder degradation shall be evaluated." This requirement is important to full implementation of subrecommendation 2 of Recommendation 95-1. While some ongoing actions are called out in the EDP, particularly with regard to reducing time of wetness, the SEMP does not delineate clear actions designed to proactively explore and identify other measures for reducing cylinder wetness and degradation.

Cylinder Corrosion. The following corrosion issues outlined in DNFSB/TECH-4 are not clearly addressed by actions in the SEMP, EDP, or PMP:

- Corrosion studies—There are no clear actions set forth to perform studies evaluating the effects (per SRD requirement 4.1.3.a) of accelerated corrosion (including corrosion after removal from ground contact), stiffener corrosion, pitting, crevice corrosion, and stress corrosion of packing nuts. In addition, the effect of internal corrosion through breaches is not clearly addressed.
- Integration of inspection program with corrosion studies and cylinder maintenance—Regarding this issue, the SRD, Revision 2, appears not to incorporate requirement 5.4.2.2.5 of the SRD, Revision 1, for inspecting cylinders and storage facilities for conformance to applicable cylinder functional criteria and the authorized safety basis.

Flowdown of SEMP Actions. It is not clear how the details of the actions defined in the SEMP are implemented in the PMP and EDP actions for execution, as called for by DOE's Implementation Plan for Recommendation 95-1. The EDP presents narrative in the "EDP Activity WCS Forms" that covers some of the details of engineering development actions called for by the SEMP, but no such WBS/WCS narrative is presented in the PMP for its actions.