6/16/03 – copy sent forward for concurrence 4

MEMORANDUM FOR: Joseph Shea,

FROM: Suzanne Black

SUBJECT: NRR Comments on the Department of Homeland Security Report on Spent Fuel Facility Commonalities and Common Vulnerabilities

At your request, we have prepared comments on the draft "Department of Homeland Security Report on Spent Fuel Facility Commonalities and Common Vulnerabilities" report.

The draft U.S. Department of Homeland Security Report on Spent Fuel Facility Commonalities and Common Vulnerabilities is well written and has only a few minor inaccuracies. It correctly notes that nuclear power plants are some of the most securely guarded commercial facilities in the world. Our major comment is that the report is written in a manner that makes it appear that the spent fuel pools (SFPs) and dry storage casks are almost invulnerable to terrorist attack. The SFPs are highly robust. We do not believe that NRC would publish a report of this nature without making the discussion of the risks involved a little more balanced. Ex 2

In the comments below, we have provided some language that could be used to provide a slightly more balanced explanation of potential SFP "vulnerabilities", without providing information that would be useful for a potential terrorist. Comments on spent fuel casks and ISFSI will be provided by the office of NMSS.

Specific Comments

* In Section I, Spent Fuel Facility, Subsection a, the second paragraph should read as follows:

  "After the fuel assemblies have been used in the reactor for several operating cycles of 18 to 24 months each, the fuel no longer produces energy efficiently, and is considerably spent. At the end of each operating cycle, the portion of the fuel assemblies that are spent (typically one-third) are transferred to the spent fuel pool for interim storage, and new fuel assemblies are installed in their place in the reactor."

* In Section I, Spent Fuel Facility, Subsection b, the second paragraph should read as follows:

  "Spent fuel pools are very robust structures that are constructed to withstand earthquakes and other natural phenomena and accidents. The spent fuel pools are typically rectangular structures 20 to 40 feet wide, 30 to 60 feet long, and at least 40 feet deep. The outside walls are typically constructed of greater than 3 feet of reinforced concrete."

* In Section I, Spent Fuel Facility, Subsection b, the last sentence in the third paragraph should read as follows:

Portions Ex 2

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"Boiling water reactors (BWRs) spent fuel pools are typically located at an elevated position in the reactor building, outside of primary containment."

* In Section I, Spent Fuel Facility, Subsection b, the forth paragraph should read as follows:

"Some of the pools at the nation's nuclear plants have up to 33 years of fuel assemblies in them and many are running out of space. Current regulations permit re-racking of the spent fuel pool grid and fuel rod consolidation, subject to NRC review and approval, to increase the amount of spent fuel that can be stored in the pool. Both of these methods are constrained by the size of the pool and the heat removal capacity of the cooling systems. Yucca Mountain, slated to open in 2012, is expected to be the single storage point for all spent fuel. Until that happens, additional storage requirements can be met by Independent Spent Fuel Storage Installations (ISFSI) (Figure 2)."

* In Section II, Consequences of Event, the first paragraph should read as follows:

"Spent fuel storage facilities and cooling systems at operating power reactors are built to be robust, but were not specifically designed to withstand a terrorist attack. Structural components are often made thicker than otherwise necessary to provide improved radiation shielding for plant workers. The robustness of the designs means that in the event of a terrorist attack, it is unlikely there would be a substantial release. Assessing the precise amount of any contamination resulting from a potential release depends on many factors such as type and amount of damage to the pool, location of the damage, proximity of the storage facility to populated areas, and meteorological conditions at the time of the event."

* In Section II, Consequences of Event, it is stated that the spent fuel pools and the dry storage casks do not have flammable material that would support a long duration fire. While this is an accurate statement, it appears out of place in the discussion and even so, a terrorist attack could include the use of incendiary devices.

* Section III, Common Vulnerabilities, paragraph 1, discusses the DBT for radiological sabotage. One could interpret the writeup to say that a plant or site that meets the DBT will be protected against a 9/11-type attack. Such an understanding would be false since the scale of a threat that is covered by the DBTs is very different from the scale of the 9/11 attack. We suggest that the sentence beginning with, "To accomplish this goal at independent spent ..." begin a new paragraph, and that the following be inserted at the end of the sentence before:

"In the event the a terrorist attack significantly exceeds the DBT, utilities will call in coordinated offsite resources, both local and national, to help defend the facility."

* Section III, Common Vulnerabilities, paragraph 4, discusses NUREG-1738, which concluded that the risk from a spent fuel pool zirconium fire at a decommissioning plant is very low. That statement is correct. The NUREG specifically noted that sabotage was not investigated during the development of the report. While there are important

insights in the NUREG about the robustness of SFPs, the frequency with which this robustness can be overcome is not addressed in nor can it be extrapolated from the report results. We recommend replacing the 4th paragraph with the following:

> "In NUREG-1738, NRC concluded that the risk from a spent fuel pool zirconium fire at decommissioning plants from random events (e.g., earthquakes, fires, and tornados) is very low due to the robustness of SFP designs, and that the risk is well below the Commission's safety goals for operating reactors. The study found that the event sequences most important to the zirconium fire risk at decommissioning plants are large (catastrophic) earthquakes and spent fuel cask drop events. The study did not address sabotage, but did demonstrate the robustness of SFPs."

Concur: M.Rubin/MTschiltz/JClifford/TTate/Susie