

March 21, 2002

MEMORANDUM TO: Farouk Eltawila, Director
Division of Systems Analysis
and Regulatory Effectiveness
Office of Nuclear Regulatory Research

THRU: Stuart Rubin, Senior Technical Advisor
Regulatory Effectiveness Assessment
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Division of Systems Analysis
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FROM: Joseph G. Giitter, Chief
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Division of Fuel Cycle Safety
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SUBJECT: SUMMARY OF PHONE CALL: TELEPHONE DISCUSSION WITH
EXELON REGARDING FUEL CYCLE ISSUES FOR THE PEBBLE BED
MODULAR REACTOR

On February 14, 2002, the U.S. Nuclear Regulatory Commission (NRC) posed questions to Exelon via phone that were associated with fuel cycle, transportation and waste issues for the Pebble Bed Modular Reactor (PBMR). The purpose of the conference call was to get clarification from Exelon on their November 15, 2001 response to staff questions identified in the September 26, 2001 Tom King letter to Jim Muntz (Exelon). The staff requests additional information from Exelon in order to complete its pre-application review of fuel cycle transportation and waste issues associated with the PBMR design. We would like to ask the Division of Systems Analysis and Regulatory Effectiveness (DSARE) to transmit a letter to Exelon asking them to formally respond to the questions contained in this memo. A summary of the technical issues discussed during the conference call along with Exelon's response is provided below.

Q1. What are Exelon's plans for submitting an application to NRC for the certification, review and approval of fresh and spent PBMR fuel transportation packages? Alternatively, does Exelon plan to use a package that has been certified by a foreign transportation competent authority?

Response: Exelon responded that they have not made specific plans regarding transport packages for fresh fuel. Fresh fuel shipments are expected in 2005, however, they have not yet looked into the possible use of a foreign-approved package

design. Fresh fuel will be imported initially. There are also no specific plans for spent fuel transport packages.

Q2. What are Exelon's plans for spent fuel storage casks? What are Exelon's plans for licensing the on-site spent fuel storage facilities for the PBMR fuel?

Response: Exelon responded that the conceptual plant designs for the PBMR reactor plant includes a "storage tank" that has the capacity to store spent fuel for a 40-year operating period, with safe storage for 40 years after the operating period. Exelon plans to license that capability as part of the reactor plant, equivalent to a spent fuel pool at an LWR reactor. Therefore, Exelon has no plans to license spent fuel casks or on-site storage facilities for the PBMR fuel.

Q3. It is estimated that the PBMR spent fuel volume may be an order of magnitude greater than light water reactor spent fuel on a per MWe basis. These larger volumes could necessitate a corresponding increase in the number of spent fuel shipments. Is Exelon considering the environmental impacts from transportation from the much larger number of spent fuel shipments?

Response: Exelon reported that PBMR fuel is not included in the DOE's Yucca Mountain analysis. Exelon has not started any conceptual planning for transportation needs. Exelon will not have information on cask design in the pre-application stage.

Q4. When will Exelon provide additional security and safeguards information?

Response: Exelon responded that they are still resolving the physical design of the reactor building and were not planning to provide additional security and safeguards information in the pre-application phase. Limited safeguards information was already provided during initial introductory meetings with NRC and the public. They will try to provide the October 2001 report from International Atomic Energy Agency (IAEA) that discusses safeguards and Material Control and Accounting (MC&A) conclusions relative to the PBMR. Based on the fact that all movement of the fuel is handled within the reactor building, the IAEA report determined that the MC&A controls were adequate.

Q5. How will the spent fuel ultimately be disposed of? Does Exelon have any projected dates and plans?

Response: Exelon stated that they have begun dialogue with DOE, and will be able to provide meaningful input to NRC by the end of 2002.

Q6. Exelon has not provided a discussion on the operational hazards of Carbon-14, Silver-110m and graphite dust. What is Exelon's strategy to protect against these hazards? Will the reactor design factor in considerations such as eventual dismantling?

Exelon will not address these hazards at the pre-application stage; they may consider addressing them at the Combined License Application stage.

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