May 2, 2000

MEMORANDUM TO: John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards

FROM: Gary M. Holahan, Director **/RA/ T. Collins**
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

SUBJECT: RESOLUTION OF GSI-173A, "SPENT FUEL POOL COOLING FOR OPERATING PLANTS"

The purpose of this memorandum is to document the resolution of Generic Safety Issue (GSI) 173A, "Spent Fuel Pool (SFP) Cooling for Operating Plants." All technical work associated with this GSI is complete. We are revising our guidance documents to incorporate the lessons learned from the study. As discussed below, the staff position is a resolution of "No Action."

In 1993, the Office of Nuclear Reactor Regulation (NRR) initiated the Spent Fuel Storage Pool Task Action Plan (hereafter, the task action plan) to address technical concerns with the storage of spent fuel at operating plants. The staff developed the task action plan to address a report submitted under 10 CFR Part 21 by two former contract employees for the Pennsylvania Power & Light Company who contended that the design of the Susquehanna Steam Electric Station failed to meet regulatory requirements with respect to the storage of spent fuel, and an event that occurred at Dresden Nuclear Power Station Unit 1, where containment flooding occurred because of freeze damage inside the containment building. The licensee reported that the configuration of the spent fuel transfer system between the SFP and the containment similarly threatened the SFP coolant inventory control. The staff addressed these and other technical issues related to the storage of spent fuel in the task action plan. GSI-173A was designed to capture any generic issues that were identified as a result of the evaluations performed for the task action plan. This issue was initially given a "High Priority" classification.

The staff position of "no action" for the resolution of this GSI is based on the findings of the task action plan. The task action plan evaluated technical issues related to wet storage of irradiated fuel, evaluated the reliability of SFP decay heat removal and the maintenance of adequate spent fuel coolant inventory in the SFP, and sought to identify areas for further regulatory action. Upon completion of the review of the technical issues, the findings of the action plan were documented in a memorandum to the Commission dated July 26, 1996. Based on these

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findings, the staff committed to perform plant-specific evaluations or regulatory analyses to determine whether safety enhancements could be justified at certain plants. The staff also committed to updating internal guidance documents used by the staff to review the designs of spent fuel storage systems. In general, the staff found that existing systems, structures, and components related to the storage of irradiated fuel provide adequate protection for public health and safety.

On August 9, 1996, the staff briefed the ACRS Full Committee on the status of the resolution of the staff's action plan for SFP cooling issues. The briefing highlighted the results of the task action plan and discussed the staff's plan to evaluate the design of certain plants where safety enhancements might be justified. At the conclusion of the briefing, the committee indicated that they were satisfied with the staff's actions. Although the staff intended to close GSI-173A based on the findings of the task action plan, NRR did not have the ACRS document their position in a letter to the Executive Director for Operations (EDO).

In parallel with the activities associated with the task action plan, the EDO directed the Office for Analysis and Evaluation of Operational Data (AEOD) to perform an independent study of the likelihood and consequences of an extended loss of spent fuel pool cooling. The results of that study were included in a memorandum to the Commission dated October 3, 1996. The study concluded that there were large variations in spent fuel pool designs and capabilities, and that loss of cooling events have been infrequent and of low consequence with no significant trends observed. The study indicated that no immediate NRC actions were warranted since SFP events were not a dominant contributor to overall plant risk, but that some additional information should be gathered on a plant-specific basis to determine whether plant-specific actions were warranted. NRR reviewed the findings of the AEOD study and revised the follow-up activities associated with the task action plan to address these findings.

In a memorandum to the Commission dated September 30, 1997, the staff documented the results of the follow-up activities for the task action plan. In some instances, licensees voluntarily took actions to address certain design issues. For the remaining issues, plant-specific risk assessments concluded that the risks did not meet the screening criteria of NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," for substantial added protection of public health and safety as required by 10 CFR 50.109, "Backfitting." Therefore, the safety enhancements that were under consideration could not be justified. The risk assessments verified that current design features and operational constraints make issues related to SFP storage a small fraction of the overall risk associated with an operating light-water reactor.

The staff is in the process of revising the guidance documents for evaluating the design of spent fuel storage systems to include insights and lessons learned from the staff action plan. This action was committed to in the staff's memorandum dated July 26, 1996. Work to update the staff guidance documents is ongoing and is being tracked under Work Item Tracking System (WITS) Item W-9600033.

In February 2000, the staff released for comment the draft final technical study on spent fuel pool accident risk at decommissioning nuclear power plants. This report was initiated by the Commission when they asked the staff to consider whether the risk from decommissioning plants was low enough to justify generic regulatory relief in the areas of emergency planning, insurance indemnification and safeguards. While the focus of the decommissioning plant study

was the risk associated with wet storage of spent fuel during decommissioning, the staff was alert to any implications on the storage of spent fuel during power operations. Based on the results of the study, the staff concluded that existing requirements for operating reactor spent fuel pools are sufficient.

Notwithstanding the staff's ongoing activities associated with decommissioning plants and incorporating lessons learned and insights into the staff guidance documents, we have concluded that additional technical work under GSI-173A is not necessary and that the results of evaluations performed under the task action plan justify the staff's conclusion that public health and safety is being maintained by those existing structures, systems, and components related to the storage of wet irradiated fuel at operating plants. For this reason, the staff recommends that the resolution "No Additional Action" be adopted for GSI-173A.

We have attached the documents relevant to the resolution of GSI-173A for your review. We would be glad to discuss the proposed resolution of GSI-173A with the Committee, if requested.

Attachments:

1. Memorandum dated July 26, 1996, for The Commissioners, from James M. Taylor, Executive Director for Operations, NRC, "Resolution of Spent Fuel Storage Pool Action Plan Issues."

2. Memorandum dated October 3, 1996, for The Commissioners, from James M. Taylor, Executive Director for Operations, NRC, "Assessment of Spent Fuel Cooling."

3. Memorandum dated September 30, 1997, for The Commissioners, from L. Joseph Callan, Executive Director for Operations, NRC, "Followup Activities On The Spent Fuel Pool Action Plan."

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* See previous concurrence

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