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POLICY ISSUE
(Information)

August 10, 1992

SECY-92-276

For: The Commissioners
From: James M. Taylor
Executive Director for Operations
Subject: SMITHSONIAN INSTITUTION EXHIBIT

Purpose: To inform the Commission of a planned exhibit at the Smithsonian Institution of tools and equipment that were used to extract samples from the lower head of the TMI-2 reactor vessel.

Background: In a memorandum dated December 23, 1991, to the Commissioners on the above subject, the staff informed the Commission that the Smithsonian Institution was interested in exhibiting equipment that was used to extract samples from the lower head of the TMI-2 reactor vessel. This Commission paper provides an update on the status of that exhibit.

All of the equipment for the exhibit was used in the TMI-2 Vessel Investigation Project (VIP). This project is being conducted by the NRC, with the support of 10 foreign countries, under the auspices of the Organization for Economic Cooperation and Development's (OECD) Nuclear Energy Agency. The VIP Management Board approved at its meeting on May 14, 1992, the proposed Smithsonian exhibit. Additional background information on this project is given below.

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NOTE: TO BE MADE PUBLICLY AVAILABLE IN 10 WORKING DAYS FROM THE DATE OF THIS PAPER.

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The objectives of the VIP are to (1) investigate the condition and properties of materials extracted from the lower head of the TMI-2 reactor pressure vessel, (2) determine the extent of damage to the lower head by chemical and thermal attack, and (3) determine the margin of structural integrity that remained in the pressure vessel.

Under the VIP program, 15 reactor vessel steel specimens, 14 incore nozzles, and 2 incore guide tubes were successfully extracted from the lower head over a 30-day period ending March 1, 1990. The vessel steel samples then were decontaminated, sectioned, and distributed to ANL, INEL and seven other participating countries for mechanical and metallographic examinations. Also, the nozzles and guide tubes were cut and distributed for examination to ANL, INEL, and the CEA in Saclay, France.

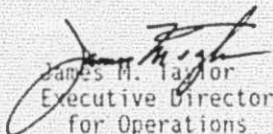
Results of the TMI-2 lower head examinations will be used to perform scoping analyses of potential reactor vessel failure modes, such as penetration tube failures and global or local failure of the reactor vessel lower head. More detailed analyses of the most likely failure mechanisms will be performed to estimate the margin-to-failure of the lower head. A final project report, integrating the results of all the sample examinations and analyses, will be issued at the completion of this program in June 1993.

Discussion:

On July 30, 1992, members of the staff met at MPR Associates, Inc., offices in Washington, DC, with Smithsonian Institution officials responsible for approving and designing the TMI-2 extraction tool exhibit. The purposes of this meeting were to see the refurbished cutting head and to provide the Smithsonian staff with additional background information on the TMI-2 Vessel Investigation Project. All the participants in the meeting were very favorably disposed toward this exhibit. Although the final design details of the exhibit have not been settled, the staff has completed the necessary steps to release the property to the Smithsonian. The staff will also provide technical summary material on the VIP for the Smithsonian's use. There are no costs to the VIP or the NRC for this exhibit.

The TMI-2 extraction tool exhibit will be included in a section on Nuclear Science that is planned as part of a major permanent exhibit on Science in American Life at the Smithsonian's National Museum of American History. Equipment for this exhibit may include the spare cutting tool and articulating arm, practice cutting samples, a cut

and polished metallographic specimen from one of the samples, protective suits used during the sample extraction (all uncontaminated), and a videotape taken during the actual extraction process. Current plans are for the exhibit to open around April 1994.


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