

MEMORANDUM TO: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

FROM: William D. Travers
Executive Director for Operations

SUBJECT: DRAFT FINAL TECHNICAL STUDY ON SPENT FUEL POOL ACCIDENT
RISK AT DECOMMISSIONING NUCLEAR POWER PLANTS

In March 1999, the NRC staff met with the Commission to discuss an ongoing effort to improve decommissioning regulations. An area of particular interest to the Commission was the perception that the risks at decommissioning nuclear power plants are very low yet many of the regulations governing decommissioning plants remain the same as those required for operating reactors. The staff proposed to take a risk-informed look at power reactor decommissioning requirements and to use the risk insights derived from this review to guide the promulgation of new regulations. The staff subsequently initiated a technical study on spent fuel pool accident risks at decommissioning plants. A preliminary study was completed in June 1999 and concluded that the risks at decommissioning nuclear power plants with recently irradiated fuel in the spent fuel pool could not be dismissed as low when compared to operating reactors due to the frequency and consequences of postulated events leading to drainage of the spent fuel pool and a subsequent zirconium fire. The staff then performed a more comprehensive study to better quantify the risk from a decommissioning nuclear power plant spent fuel pool and provide recommendations, where appropriate, on the factors that have the biggest impact on the risk. The results of the study are intended to support rulemaking in regulatory areas such as emergency planning, safeguards, and insurance for decommissioning plants. The details of this effort are discussed in SECY-99-168, "Improving Decommissioning Regulations for Nuclear Power Plants," dated June 30, 1999.

The staff has now completed a review and requantification of its preliminary risk assessment including independent outside technical review of its analyses and assumptions. Substantial efforts to involve public and industry representatives throughout this effort have been expended. The NRC solicited feedback on its June study assumptions and methods and held numerous public meetings including a 2-day public workshop. Attached for your information is the draft final technical study on spent fuel pool accident risks at decommissioning nuclear power plants.

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The results of this report estimated the generic frequency of events leading to zirconium fires at decommissioning plants to be less than 3×10^{-6} per year for a plant that implements the design and operational characteristics assumed in the risk assessment performed by the staff. This frequency was estimated based on the assumption that the industry commitments plus additional staff assumptions would be implemented. This estimate could be much higher for a plant that does not implement these operational characteristics. The most significant contributor to this risk is a seismic event which exceeds the design basis earthquake. However, the overall frequency of this event is within the staff developed spent fuel pool performance guideline for large radionuclide releases (related to a zirconium fire) of 1×10^{-5} per year.

Concurrent with providing the Commission a copy of this draft report, the staff will be issuing it for public comment via the Federal Register and an NRC web page. Following resolution of any Commission and public comments and review by the ACRS, the staff will publish the final report in May 2000. The staff will utilize the industry commitments and the conclusions in this report to support an integrated decommissioning rulemaking plan to be submitted in June 2000 and develop interim guidance for any future plants that elect to decommission prior to establishing revised regulations.

Attachment: Draft Final Study on Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants

cc w/att: SECY
OGC
OCA
OPA
CFO
CIO

Technical Contributors
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