

Spent Fuel Pool Accident Risk Report

The Nuclear Regulatory Commission is issuing a staff report on the potential accident risk, under certain postulated conditions, in a spent fuel pool at a decommissioning nuclear power plant. The results of the study indicate that the risk at SFPs is low and well within the Commission's Quantitative Health Objectives (QHOs).

The Commission plans to conduct a public meeting on the report on February 20, at which time the NRC staff, as well as industry and interested public stakeholders, will be invited to make presentations. These comments, together with others offered in writing by all interested parties prior to that meeting, will be taken into consideration by the Commission in preparing a proposed new rule on improving decommissioning regulations for nuclear power plants. The rulemaking is intended to provide a framework for regulation of permanently shutdown nuclear power plants. One objective is to reduce the need to process exemption requests in areas such as insurance, security, and emergency preparedness. The staff plans to submit policy options to the Commission in May.

Spent fuel continues to generate decay heat long after the fuel is no longer of use in the reactor. Cooling is normally provided, either by way of the water in the spent fuel pool, or by air convection in the case of fuel placed in dry casks. Zirconium alloy tubes surround the uranium pellets in forming the fuel rods. The staff report being released today, which is available in ADAMS ML010160522, concludes the risk of a zirconium fire, due to the overheating of fuel that has been removed from the reactor and is stored in the spent fuel pool, is not zero, but very low. If a fire occurred, however, it could have serious radiological effects.

The amount of decay heat decreases with time and is quite manageable by a variety of mechanisms for normal and most abnormal conditions. However, since heat generation never dissipates entirely, it must be considered for safety purposes even many years after final shutdown. This fact prompted the in-depth staff study, called for by the Commission in December 1999, in response to a paper on improving decommissioning regulations for nuclear power plants (SECY-99-168).

Preliminary drafts of the study were issued for public comment and technical reviews in June of 1999 and February of last year. Comments from interested stakeholders, from the Advisory Committee of Reactor Safeguards, and other technical reviewers have been taken into account in preparing the report being made public today. A broad quality review was carried out at the Idaho National Engineering and Environmental Laboratory, and a panel of human reliability analysis experts evaluated the assumptions, methods and modeling.

The staff report released today concludes that there is no immediate safety concern at decommissioned sites and thus no need for immediate regulatory action. This is because of the low likelihood of a fuel uncover event that could result in a zirconium fire and a potentially significant off-site radiological release.

The Commission welcomes comments from all interested parties, particularly in advance of the February 20 public meeting at NRC headquarters.

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