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ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment for Proposed Rule Entitled, "Storage of Spent Nuclear Fuel in NRC-Approved Storage Casks at Nuclear Power Reactor Sites."

Identification of Proposed Action

The Commission is proposing to amend its regulations in 10 CFR Part 72 to provide for additional storage of spent nuclear fuel at commercial power reactor sites without the need for additional site-specific approvals. The proposed amendment would allow holders of power reactor licenses to be issued a general license which would permit onsite storage of its spent fuel in casks approved by NRC, thus eliminating the need to submit a license application for an Independent Spent Fuel Storage Installation (ISFSI). The proposed amendment also contains criteria for obtaining NRC approval for spent fuel storage casks. The cask approval program would be analogous to that for spent fuel shipping casks under 10 CFR Part 71. Under this proposed amendment, the cask will be relied on to provide safe confinement of that fuel independent of the reactor site location and when used within specified limits. A reactor licensee, in order to use an NRC approved cask onsite, would have to ensure that the reactor site parameters and potential site-boundary doses were within the scope of the cask safety analysis report and reactor license. Spent fuel storage in approved casks at the site of a commercial power reactor would still have to comply with the existing safety requirements of 10 CFR Part 72.

The Need for the Proposed Action

This proposed rulemaking to amend 10 CFR Part 72 is needed to bring NRC regulations into compliance with the Nuclear Waste Policy Act of 1982 (NWPA) (Pub. L. 97-425). Section 133 of the NWPA states, in part, that "the [Nuclear Regulatory] Commission shall, by rule, establish procedures for the licensing of any technology approved by the Commission under section 218(a) for use at the site of any civilian nuclear power reactor." Further, Section 218(a) of the NWPA includes the following directive, "The Secretary [of DOE] shall establish a demonstration program in cooperation with the private sector, for the dry storage of spent nuclear fuel at civilian nuclear power reactor sites, with the objective of establishing one or more technologies that the Commission may, by rule, approve for use at the sites of civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site-specific approvals by the Commission." Hence, this proposed amendment to 10 CFR Part 72 to provide for spent fuel storage cask approval and general licenses to power reactor licensees for dry cask storage of spent fuel onsite without site-specific approval by NRC.

Environmental Impacts of Proposed Action

There has been over 30 years of experience with dry storage of spent fuel in the United States and other countries. The environmental impacts associated with storage of light water reactor (LWR) spent fuel (including dry storage) have been previously considered in other Commission rulemakings and licensing actions on which this assessment is tiered. The "Final Generic Environmental Impact Statement on the Handling and Storage of Spent Light Water Reactor

Fuel," NUREG-0575 (August 1979), was issued in support of the initial effective rule (45 FR 74699, November 12, 1980). In a proceeding entitled "Final Waste Confidence Decision," published in the Federal Register (49 FR 34688) on August 31, 1984, the Commission found "reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, and at either onsite or offsite independent spent fuel storage installations." The "Environmental Assessment for 10 CFR Part 72 'Requirements for the Independent Storage of Spent Fuel and High-Level Radioactive Waste,'" NUREG-1092 (August 1984), and the Supplementary Information of a proposed rule published in the Federal Register (51 FR 19106) on May 27, 1986, contain specific analyses showing that the potential environmental impacts from dry storage of spent fuel in casks are small. Additionally, for a site specific analysis, the "Environmental Assessment Related to the Construction and Operation of the Surry Dry Cask Independent Spent Fuel Storage Installation," April 1985, Docket No. 72-2, concluded that dry cask storage on the reactor site would not significantly affect the quality of the human environment and subsequently led to the issuance of a Finding of No Significant Impact (50 FR 15517, April 18, 1985).

The major non-radiation environmental impacts for dry cask storage of spent fuel would be those related to fabrication of the casks and construction of the storage facility. In "Spent Fuel Storage Requirements 1987," DOE/RL-87-11 (September 1987), DOE estimates that by the year 2000 about 6753 metric tons of uranium (MTU) as spent fuel will need to be stored outside of existing reactor storage pools. Assuming about 10 MTU per cask, about 675 casks would be

required to store this amount of spent fuel. Storage casks weigh about 100 tons and are fabricated mainly from steel, lead or uranium, concrete and plastic. The estimated 67,500 tons of steel required for these casks over this time period is expected to have very little impact on the steel industry. The amounts of lead and iron needed would not have significant incremental impacts on the mining and use of these metals. Similarly, the amount of uranium used in these casks would not have significant incremental impacts on the uranium industry because the uranium needed could be obtained from processing some of the vast supply of depleted uranium available as uranium hexafluoride. If concrete casks are used, the amount of concrete required would be small compared to industrial and construction uses. The amount of plastic, most commonly polyethylene used as a neutron shield, would not be more than about a ton per cask and would be insignificant compared to the millions of tons produced annually.

Other than casks, storage of spent fuel under a general license would consist primarily of cranes and mobile equipment necessary to move the casks, reinforced concrete pads on which the casks are placed, and the land. The materials required for such ancillary equipment and structures are small, and incremental impacts from their construction and use are not considered to be significant. Land use commitments are negligible. Only a small fraction of the licensee's land previously committed for the nuclear power station would be used.

Incremental impacts caused by the operation of dry cask storage of spent fuel under a general license are not considered significant. No effluents are expected from the sealed dry storage casks. However, activities associated

with cask loading and decontamination may result in some small incremental liquid and gaseous effluents. These operations will be conducted under 10 CFR Part 50 reactor operating licenses, and effluents will be controlled to be within existing reactor technical specifications. Because of the relatively large reactor sites, any incremental doses offsite due to direct radiation exposure from the spent fuel storage casks are expected to be small and when combined with the contribution from reactor operations will be well within the 25 mrem/yr limit to the whole body specified in 10 CFR 72.67 and 40 CFR 190. Incremental impacts in collective occupational exposure due to dry cask storage of spent fuel under a general license are expected to be only a small fraction of that occurring from operation of the nuclear power station.

The staff has assessed the public health consequences of dry cask storage accidents. In connection with separate ongoing rulemakings related to licensing requirements for storage of spent fuel and high-level radioactive wastes (51 FR 19106, 5/17/86) and emergency preparedness (52 FR 12921, 4/20/87), the staff reevaluated consequences of potential accidents involving spent fuel storage in dry casks ("A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," NUREG-1140 (June 1985)). The safety evaluation in NUREG-0709, "Safety Evaluation Report Related to the Renewal of Material License SNM-1265 for Receipt, Storage, and Transfer of Spent Fuel Pursuant to 10 CFR Part 72 - Morris Operations - General Electric Company", revealed no reason to increase the estimated doses in NUREG-0575. The staff also determined that the release from dry cask storage is of a comparable magnitude to that from a spent fuel storage basin. The staff also assessed public health consequences from acts of radiological sabotage and concluded that, to be successful, it would have to be carried out with the aid of

explosives. The public health consequences from an explosive sabotage event would stem almost exclusively from the release of respirable particles. In an NRC study, an experiment was carried out to evaluate the effects of a severe, perfectly executed sabotage scenario against a simulated storage cask containing spent fuel assemblies. The whole-body dose to an offsite individual was calculated based on the release data and found to be about 1 rem. The experiment and calculations lead to the conclusion of low public health consequences. As a result of these evaluations, the staff determined that, because of the physical characteristics of the storage casks and the conditions of storage that include specific security provisions, the potential risk to the public health and safety due to accidents or sabotage is extremely small.

Decommissioning dry cask spent fuel storage under a general license would be carried out as part of the power reactor site decommissioning plan. It would consist of removing the spent fuel from the site and decontaminating cask surfaces. The casks would then be released for re-use or disposal. No residual contamination is expected to be left behind on supporting structures. The incremental cost associated with decommissioning is expected to represent a small fraction of the cost of decommissioning an entire nuclear power station.

Because this proposed amendment to 10 CFR Part 72 would not change the existing safety and environmental requirements for the storage of spent nuclear fuel, and because dry cask spent fuel storage under a general license will still have to meet these requirements, no reduction in the protection of public health and safety is anticipated. In previous rulemaking proceedings, the Commission

determined that compliance with the requirements of 10 CFR Part 72 would ensure adequate protection of the public health and safety. Based on the above assessment, the Commission finds that dry cask spent fuel storage under a general license by reactor licensees would not have a significant environmental impact.

Alternatives to The Proposed Action

Because the Commission has determined that there are no significant environmental impacts associated with the proposed action, any alternative with equal or greater environmental impacts need not be evaluated.

The principal alternatives available to the NRC would be procedural in nature whereby dry cask spent fuel storage could be approved under other existing or new parts of Title 10, Code of Federal Regulations. Regardless of the method selected to approve such dry cask spent fuel storage, all would have similar environmental impacts.

The NWA directs that the Commission approve one or more technologies, that have been developed and demonstrated by DOE, for the use of spent fuel storage at the sites of civilian nuclear power reactors without, to the extent practicable, the need for additional site-specific review. It also directs that the Commission, by rule, set forth procedures for licensing the technology. Regulations for accomplishing this are not in place, thus some action is necessary to comply with the NWA. Therefore, the no action alternative is not acceptable.

Alternative spent fuel storage technologies exist. However, at this time, the NRC considers them neither sufficiently demonstrated nor practicable without additional site-specific reviews. If other storage technologies become more amenable to this type of action, they could be considered at a later time.

Alternative Use of Resources

The only irreversible commitments of resources determined in this assessment were those materials needed for the casks and the land used for the storage site. The resource commitments for dry cask storage are similar to those required for extended storage of spent fuel previously evaluated in NUREG-0575.

Agencies and Persons Contacted

No agencies or persons outside the NRC were contacted in connection with the preparation of this environmental assessment.

Finding of No Significant Impact

Based on the foregoing environmental assessment, the Commission concludes that this proposed rulemaking, entitled "Storage of Spent Nuclear Fuel in NRC Approved Storage Casks at Nuclear Power Reactor Sites" will not have a significant incremental effect on the quality of the human environment. The Commission has, therefore, determined not to prepare an environmental impact statement for this rulemaking.