UNITED STATES NUCLEAR REGULATORY COMMISSION

DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370 OL

NOTICE OF ENVIRONMENTAL ASSESSMENT AND FINDING

OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action: The amendment would permit the increase in the licensed storage capacity from 500 spent fuel assemblies to 1463 spent fuel assemblies for each McGuire spent fuel pool. This would extend the full core discharge capability for each generating unit from the year 1990 to the year 2010.

The Need for the Proposed Action: On April 17, 1977, President Carter issued a policy statement on commercial reprocessing of spent nuclear fuel which effectively eliminated reprocessing as part of the relatively near term nuclear fuel cycle. On October 18, 1977, the Generic Environmental Statement for Mixed Oxide proceedings were deferred indefinitely. The combined effect of this national policy was to leave operating nuclear plants, like McGuire, without a repository in the near-term for the spent fuel previously generated or being generated. Thus, additional reracking of the McGuire spent fuel pools to further increase its storage capacity is required in order to provide onsite spent fuel storage capacity until offsite storage or disposal capacity is available.

Environmental Impacts of the Proposed Action:

A. Radiation Exposure

Occupational Exposure

The licensee has estimated that the radiation doses incurred by workers taking part in the McGuire 1 & 2 spent fuel pool modification will be 15 person-rems. This is a small fraction of the total annual dose from routine occupational radiation exposure at the plant. Operation of the plant with additional spent fuel in the spent fuel pool is not expected to increase the occupational dose by more than 1% of the present average total collective annual occupational dose at this facility.

Public Exposure

The staff has completed an analysis of radiation exposure experience, based on estimated source terms and assessment of public doses resulting from 38 prior spent fuel pool modifications at 37 plants.

Estimated doses to a hypothetical maximally exposed individual at the boundary of a plant site, during such modifications, have fallen within a range from 0.00004 to 0.1 millirem per year, with an average dose of 0.02 millirem per year. Similarly, estimated total doses to the population within a 50-mile radius of these plants have fallen within a range from 0.0001 to 0.1 person-rem per year, with an average population dose of 0.006 person-rem per year. Doses at these levels are essentially unmeasurable.

Based on the manner in which the licensee will perform the modification; our previous evaluation of their radiation protection/as low as reasonable achievable (ALARA) program during the licensing process; the radiation protection measures proposed for the modification task, including radiation, contamination, and airborne radioactivity monitoring; and relevant experience from other

operating reactors that have performed similar spent fuel pool modifications, the staff concludes that adequate radiation protection measures have been taken to assure worker protection, and the McGuire spent fuel pool modification can be performed in a manner that will ensure that doses to workers and the general public will be ALARA.

Additionally, we have estimated the increment in onsite occupational dose during normal operations after the pool modification as a result of the proposed increase in stored fuel assemblies. This estimate is based on information supplied by the licensee for occupancy times and for dose rates in the spent fuel area from radionuclide concentrations in the spent fuel pool (SFP) water. The spent fuel assemblies themselves contribute a negligible amount to dose rates in the pool area because of the depth of water shielding the fuel. Based on present and projected operations in the spent fuel pool area, we estimate that the proposed modification should add less than one percent of the total annual occupational radiation exposure at both units. The small increase in radiation exposure should not affect the licensee's ability to maintain individual occupational doses to as low as is reasonably achievable levels and within the limits of 10 CFR Part 20. Thus, we conclude that storing additional fuel in the two pools will not result in any significant increase in doses received by workers.

Based on this review of historical data, we conclude that for the proposed spent fuel pool expansion at McGuire, the additional dose to the total body that might be recieved by an individual at the site boundary, and by the population within a 50-mile radius, respectively, would be less than or equal to 0.1 millirem and 0.1 person-rem per year, respectively. These doses are very small

compared to annual exposure to natural background radiation in the United States, which varies from about 70 millirems per year to about 300 millirems per year depending on geographical location. (Reference: "Natural Radiation Exposure in the United States," Donald T. Oakley, U.S. Environmental Protection Agency, Office of Radiation Programs (ORP/SID 72-1), June 1972).

B. Radioactive Wastes

The plant contains radioactive waste treatment systems designed to collect and process the gaseous, liquid and solid waste that might contain radioactive material. The radioactive waste treatment systems are evaluated in the Final Environmental Statement (FES) dated April 1976. There will be no change in the waste treatment systems described in Section 3.2.3 of the FES because of the proposed spent fuel pool (SFP) rerack.

Radioactive Material Released to the Atmosphere

The present licensed storage capacity is 500 spent fuel assemblies for each SFP. The proposed amendments would increase the licensed storage capacity to 1463 spent fuel assemblies for each SFP. This would extend the full core discharge capability for each generating unit from the year 1990 to the year 2010.

With respect to releases of gaseous materials to the atmosphere, the only radioactive gas of significance which could be attributable to storing additional spent fuel assemblies for a longer period of time would be the noble gas radionuclide Krypton-85 (Kr-85). Experience has demonstrated that after spent fuel has decayed 4 to 6 months, there is no longer a significant release of fission products, including Kr-85, from stored spent fuel containing cladding defects. To determine the average annual release of Kr-85, we assume that all of the Kr-85 released from any defective fuel discharged to the SFP will be

released prior to the next refueling. The enlarged capacities of the pools has no effect on the calculated average annual quantities of Kr-85 released to the atmosphere each year.

Iodine-131 releases from spent fuel assemblies to the SFP water will not be significantly increased because of the expansion of the fuel storage capacity since the Iodine-131 inventory in the fuel will decay to negligible levels between refuelings.

Most of the tritium in the SFP water results from activation of boron and lithium in the primary coolant and this will not be affected by the proposed changes. A relatively small amount of tritium is contributed during reactor operation by fissioning of reactor fuel and subsequent diffusion of tritium through the fuel and the Zircaloy cladding. Tritium release from the fuel essentially occurs while the fuel is hot, that is, during operations and, to a limited extent, shortly after shutdown. Thus, expanding the SFP capacity will not significantly increase the tritium activity in the SFP.

Storing additional spent fuel assemblies is not expected to increase the bulk water temperature during normal refuelings above the value of 150°F used in the design analysis. Therefore, it is not expected that there will be any significant change in the annual release of tritium or iodine as a result of the proposed modifications from that previously evaluated in the FES.

Solid Radioactive Wastes

The concentration of radionuclides in the pool water is controlled by the filters and the demineralizer and by decay of short-lived isotopes. The activity is highest during refueling operations when reactor coolant water is introduced into the pool, and decreases as the pool water is processed through

the filters and demineralizer. The increase of radioactivity, if any, due to the proposed modification, should be minor because of the capability of the cleanup system to continuously remove radioactivity in the SFP water to acceptable levels.

We do not expect any significant increase in the amount of solid waste generated from the SFP cleanup systems due to the proposed modification. The amount of solid waste is assumed to increase by one resin bed (50 cubic feet) and one spent filter cartridge (10 cubic feet) per year due to the increased operation of the SFP cleanup system for each unit. The annual average volume of solid wastes shipped offsite for burial from a typical PWR is approximately 20,000 cubic feet. If the storage of additional spent fuel does increase the amount of solid waste by an average of about 60 cubic feet (120 cubic feet solidified) per year per generating unit, the increase in total waste volume shipped from the McGuire Nuclear Station would be less than 1% and would not have any significant additional environmental impact.

If the present spent fuel racks to be removed from the SFP of Unit 1 because of the proposed modification are contaminated, they may be disposed of as low level solid waste (approximately 14,000 cubic feet). We also assumed that approximately 325 filters from the portable vacuum cleaner (approximately 1600 cubic feet of waste) will need to be disposed of because of the rerack. Therefore, we have estimated that approximately 16,000 cubic feet of solid radwaste will be removed from Unit 1 because of the proposed modifications. Averaged over the lifetime of the station, this would increase the total waste volume shipped from the station by less than 2%. This will not have any significant additional environmental impact.

Radioactive Material Released to Receiving Waters

There should not be a significant increase in the liquid release of radionuclides from the plant as a result of the proposed modifications. Because the SFP cooling and cleanup systems operate as a closed system, only water originating from cleanup of SFP floors and resin sluice water need be considered as potential sources of radioactivity.

It is expected that neither the quantity nor activity of the floor cleanup water will change as a result of these modifications. The SFP demineralizer resin removes soluble radioactive materials from the SFP water. These resins are periodically sluiced with water to the spent resin storage tank. The amount of radioactivity on the SFP demineralizer resin may increase slightly due to the additional spent fuel in the pool, but the soluble radioactive material should be retained on the resins. If any radioactive material is transferred from the spent resin to the sluice water, it will be removed by the liquid radwaste system. After processing in the liquid radwaste system, the amount of radioactivity released to the environment as a result of the proposed modification would be negligible.

Alternative Use of Resources: This action does not involve the use of resources not previously considered in connection with the Nuclear Regulatory Commission's Final Environmental Statement dated April 1976 related to this facility.

Agencies & Persons Consulted: The NRC staff reviewed the licensee's request and did not consult other agencies or persons.

Finding of No Significant Impact: The Commission has determined not to prepare an environmental impact statement for the proposed license amendment.

Based upon this environmental assessment, we conclude that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for amendment dated February 17, 1984, which is available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., and at the Atkins Library, University of North Carolina, Charlotte (UNCC Station), North Carolina 28242.

Dated at Bethesda, Maryland, this 14th day of September 1984.

FOR THE NUCLEAR REGULATORY COMMISSION

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