Mr. Charles M. Dugger
Vice President Operations
Entergy Operations, Inc.
P. O. Box B
Killona, LA 70066

June 30, 1998

SUBJECT: ENVIRONMENTAL ASSESSMENT RELATED TO RERACKING OF SPENT FUEL POOL - WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. M98325)

Dear Mr. Dugger:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for amendment dated March 27,1997, as supplemented by letters dated April 3, July 21, October 23, November 13, and December 12,1997, January 21, January 29, March 23, May 1, May 19, May 21, May 28, and June 12, 1998. The proposed amendment would change the Appendix A Technical Specifications by increasing the Spent Fuel Pool storage capacity and by increasing the maximum fuel enrichment from 4.9 w/o (nominal weight percent) to 5.0 w/o U-235.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

ORIGINAL SIGNED BY:

Chandu P. Patel, Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: Environmental Assessment

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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UNITED STATES NUCLEAR REGULATORY COMMISSION

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. NPF-38, issued to Entergy Operations, Inc., (the licensee), for operation of the Waterford Steam Electric Station, Unit 3 (Waterford 3), located in St. Charles Parish, Louisiana.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would change the Waterford 3 Technical Specifications to allow an increase in the Waterford 3 Spent Fuel Pool (SFP) storage capacity from 1088 to 2398 fuel assemblies, and to allow an increase in the maximum fuel enrichment from 4.9 w/o (weight percent) to 5.0 w/o U-235. The increase in spent fuel storage capacity is achieved by replacing the existing spent fuel storage racks by the higher density racks, a process referred to herein as "reracking." The proposed action is in accordance with the licensee's application for license amendment dated March 27, 1997, as supplemented by letters dated April 3, July 21, October 23, November 13, and December 12, 1997, January 21, January 29, March 23, May 1, May 19, May 21, May 28, and June 12, 1998.

The Need for the Proposed Action:

The Waterford 3 SFP currently contains 1088 storage cells in 16 spent fuel racks and full core off-load capability would be lost in the year 2000. Under the proposed reracking, the 16

existing racks, which contain Boraflex as the neutron absorber, would be removed and replaced by new high density modules. There are no commercial independent spent fuel storage facilities operating in the U.S., nor are there any domestic reprocessing facilities; therefore, the projected loss of storage capacity in the Waterford 3 SFP would affect the licensee's ability to operate Waterford 3. The proposed amendment will provide a full core off-load capability through the end of Cycle 19 (Year 2018).

Environmental Impacts of the Proposed Action:

Radiological Impacts

The Waterford 3 uses waste treatment systems designed to collect and process gaseous, liquid, and solid waste that might contain radioactive material. These radioactive waste treatment systems are evaluated in the Final Environmental Statement (FES) dated March 1973. The proposed rerack will not involve any change in the waste treatment systems described in the FES.

Radioactive Material Released to the Atmosphere

During reactor operation, a small percentage of the fuel assemblies in the core are expected to develop leaks, resulting in a release of fission products to the reactor coolant. The storage of additional spent fuel assemblies in the SFP will not significantly affect the release of radioactive gases from the SFP since fission products generally do not escape from the SFP.

The higher fuel burnup used in the new rack analysis will result in a higher concentration of Krypton-85 (Kr-85) in the reactor coolant, some of which will be introduced into the SFP water during refuelings. Accounting for this increased Kr-85 concentration in the SFP water, the licensee calculated that the Kr-85 concentration in the air in the fuel handling building would be

two orders of magnitude lower than the permissible effluent concentration for the general public (Appendix B of 10 CFR Part 20).

Iodine-131 released from spent fuel assemblies to the SFP water will not be significantly increased due to 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. A relatively small amount of tritium is produced during reactor operation by the fission process within the reactor fuel. The subsequent diffusion of the tritium through the fuel and cladding represents a small contribution to the total amount of tritium in the SFP water. Tritium releases from the fuel assemblies to the reactor coolant occur mainly during reactor operation and, to a limited extent, shortly after shutdown. Since a small portion of the tritium is due to fission in the fuel, the increased fuel burnup will result in an increase in the amount of tritium in the reactor coolant.

Most airborne releases of tritium from nuclear power plants result during refuelings from evaporation of reactor coolant, which contains tritium in higher concentrations than in the SFP. The storage of additional spent fuel assemblies in the SFP is not expected to increase the SFP bulk water temperature significantly above the 155° used in the design analysis and, therefore, evaporation rates from the SFP are not expected to increase. The higher tritium concentrations in the SFP water are expected to result in higher airborne tritium levels in the fuel handling building. However, the licensee has calculated these tritium levels to be lower than the permissible effluent concentrations for the general public contained in Appendix B of 10 CFR Part 20.

Solid Radioactive Wastes

Spent resins are generated by the processing of SFP water through the SFP purification system. These spent resins are replaced about two to four times a year and are disposed of as solid radioactive waste. The licensee will use a vacuum system with an underwater filtration unit to clean the floor of the Cask Storage Pit prior to reracking and the floor of the SFP following removal of the old SFP rack modules. Vacuuming of the SFP and Cask Storage Pit will remove any extraneous debris, reduce general contamination levels prior to diving operations, and ensure visual clarity in the SFP to facilitate diving operations and SFP rack changeout. The licensee also plans on hydrolazing the old fuel rack modules with demineralized water before removal from the SFP to remove any loose crud from the modules. If necessary, the licensee may also use a wire brush or equivalent abrasive tool to assist in the removal of hot particles. The licensee does not expect that the additional fuel storage made possible by the increased storage capacity will result in a significant change in the generation of solid radwaste (in the form of spent resins).

Once the old SFP rack modules have been hydrolazed, they will be placed into anti-contamination bags and loaded into shipping containers for shipment offsite for decontamination and disposal. The licensee has stated that the shipping containers and procedures will conform to all applicable U.S. Department of Transportation (DOT) and/or U.S. NRC regulations.

Liquid Radioactive Wastes

There should not be a significant increase in the liquid release of radionuclides from the plant as a result of the modifications. The SFP cooling and purification system operates as a closed system. The SFP ion exchanger resins remove soluble radioactive materials from the SFP water and the frequency of resin changeout may increase during the installation of the new racks due to the more frequent fuel shuffling and underwater hydrolazing of the old racks during

removal. When the resins are changed out, a small amount of resin sluice water is released. However, the amount of liquid radioactive released to the environment as a result of the proposed reracking is expected to be negligible.

Occupational Doses

Radiation Protection personnel will constantly monitor the doses to the workers during the reracking operation. Divers used to perform work in the SFP will be equipped with five remote readout radiation detectors, which will be continuously monitored by Radiation Protection personnel. The total occupational dose to plant workers as a result of the reracking operation is estimated to be between 6 and 12 person-rem. This dose estimate is comparable to doses for similar SFP modifications performed at other plants. The upcoming reracking operation will follow detailed procedures prepared with full consideration of ALARA principles. On the basis of our review of the Waterford 3 proposal, the staff concludes that the Waterford 3 SFP rack modification can be performed in a manner that will ensure that doses to workers will be maintained as low as is reasonably achievable (ALARA). The estimated dose of 6 to 12 person-rem to perform the proposed SFP rerack is a small fraction of the annual collective dose accrued at Waterford 3.

Uranium Fuel Cycle and Transportation

The environmental impacts of transportation resulting from the use of higher enrichment fuel are discussed in the staff assessment entitled "NRC Assessment of the Environmental Effects of Transportation Resulting from Extended Fuel Enrichment and Irradiation," dated July 7, 1988. This was published in the Federal Register on August 11, 1988 (53 FR 30355), as corrected on August 24, 1988 (53 FR 32322), in connection with an Environmental Assessment and Finding of No Significant Impact related to the Sheron Harris Nuclear Power Plant, Unit 1. As indicated therein, the environmental cost contribution of an increase in fuel enrichment of up

to 5 weight percent U-235 and irradiation limits of up to 60 gigawatt days per metric ton (GWD/MT) are either unchanged, or may in fact be reduced from those summarized in Table S-4 as set forth in 10 CFR 51.52(c). These findings are applicable to the proposed amendment for Waterford 3. Accordingly, the Commission concludes that this proposed action would result in no significant radiological environmental impact.

Accident Considerations

In its application, the licensee evaluated the possible consequences of a fuel handling accident to determine the thyroid and whole-body doses at the Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and Control Room. The proposed reracking of the Waterford 3 SFP will not affect any of the assumptions or inputs used in evaluating the dose consequences of a fuel handling accident and therefore will not result in an increase in the doses from a postulated fuel handling accident.

Nonradiological Impact

The proposed amendment does not modify land use at the site; no new facilities or laydown areas are needed to support the rerack or operation after rerack; therefore, the proposed amendment does not affect land use or land with historical or archeological sites. The proposed action does not result in any significant changes to the types and amounts of effluents that may be released offsite. Therefore, no changes or different types of nonradiological environmental impacts are expected as a result of the amendment.

Summary

The Commission has completed its evaluation of the proposed action. The change will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released offsite, and there is no significant increase in the allowable individual or cumulative occupational radiation exposure. Accordingly, the Commission

concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does not affect nonradiological plant effluents. Accordingly, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

Since the Commission has concluded there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the application would not result in any significant change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for the Waterford 3.

Agencies and Persons Consulted:

In accordance with its stated policy, on June 17, 1998, the staff consulted with the Louisiana State official, Dr. Stan Shaw of the Louisiana Radiation Protection Division, regarding the environmental impact of the proposed action. The State official had no comments.

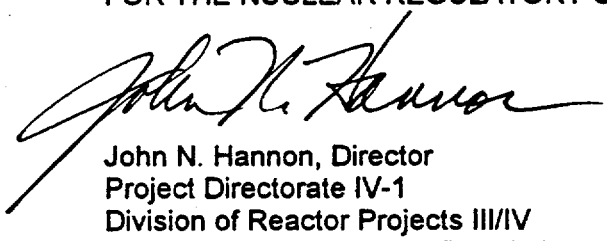
FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated March 27, 1997, as supplemented by letters dated April 3, July 21, October 23, November 13, and December 12, 1997, January 21, January 29, March 23, May 1, May 19, May 21, May 28, and June 12, 1998, which are available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the University of New Orleans Library, Louisiana Collection, Lakefront, New Orleans, LA 70122.

Dated at Rockville, Maryland, this 30th day of June 1998.

FOR THE NUCLEAR REGULATORY COMMISSION



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