

Mr. D. E. Young, Vice President
 Carolina Power & Light Company
 H. B. Robinson Steam Electric Plant,
 Unit No. 2
 3581 West Entrance Road
 Hartsville, South Carolina 29550

March 1, 1999

SUBJECT: ENVIRONMENTAL ASSESSMENT OF REQUEST FOR AMENDMENT REGARDING
 UNREVIEWED SAFETY QUESTION RAISED BY MOVEMENT OF SPENT FUEL
 SHIPPING CASK - H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 (TAC
 NO. MA0652)

Dear Mr. Young:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for amendment dated August 28, 1997, as supplemented by your letters dated June 17, 1998, October 29, 1998, and February 11, 1999. The proposed amendment revises the H. B. Robinson Steam Electric Plant Updated Final Safety Analysis Report by providing an evaluation of a previously unanalyzed potential event. The event is a spent fuel cask drop which could occur when the cask, with its valve covers removed, is moved by crane using a non-redundant cask lifting yoke from the decontamination facility to the shipping railcar. The analysis also considered potential damage by lateral movement of the cask into plant equipment that results in damage to the valves.

The Environmental Assessment and Finding of No Significant Impact is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

Ramachandran Subbaratnam, Project Manager
 Project Directorate II/Section II-2
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: Environmental Assessment
 cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 31, 1999

Mr. D. E. Young, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: ENVIRONMENTAL ASSESSMENT OF REQUEST FOR AMENDMENT
REGARDING UNREVIEWED SAFETY QUESTION RAISED BY MOVEMENT OF
SPENT FUEL SHIPPING CASK - H. B. ROBINSON STEAM ELECTRIC PLANT,
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Sincerely,

A handwritten signature in black ink that reads "Ram Subbaratnam".

Ramachandran Subbaratnam, Project Manager
Project Directorate II/Section II-2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: Environmental Assessment

cc w/encl: See next page

UNITED STATES NUCLEAR REGULATORY COMMISSION

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-261

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

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 DPR-23 issued to Carolina Power and Light Company (the licensee) for operation of the H. B. Robinson Steam Electric Plant (HBRSEP), Unit 2, located at the licensee's site in Darlington County, South Carolina.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would amend the Facility Operating License to reflect a revision to the HBRSEP Updated Final Safety Analysis Report (UFSAR) to include the evaluation of a previously unanalyzed spent fuel cask drop scenario. The analysis also considered a second scenario of potential damage by lateral movement of the cask into plant equipment that results in damage to the valves while shipping with the valve covers removed. The cask drop scenario is hypothesized to occur during movement of spent fuel shipping cask model IF-300, without the cask valve covers installed, from the decontamination facility at the HBRSEP to the shipping railcar using a crane in a non-single-failure-proof configuration, i.e. using a non-redundant cask lifting yoke. The maximum potential height from which the cask could be dropped during the time of transfer with a non-redundant cask lifting yoke is 30 feet. The postulated accident

associated with lateral movement of the cask could occur anytime during the general handling of the cask without the cask valve covers installed. The proposed action is in accordance with the licensee's request for NRC review dated August 28, 1997, as supplemented by letters dated June 17, 1998, October 29, 1998, and February 11, 1999.

The Need for the Proposed Action:

At HBRSEP, Unit No. 2, loaded Spent Fuel Shipping Casks are shipped by rail to CP&L's Shearon Harris Nuclear Power Plant (SHNPP), where the fuel is placed in long-term storage in the SHNPP spent fuel pool. With the cask valve covers installed the IF-300 shipping cask is designed to withstand being dropped from 30 feet onto an unyielding surface. The current Certificate of Compliance (CoC) for the IF-300 cask requires the valve box covers be fully installed. However, during a portion of the overall cask handling process, CP&L is constrained in its movement of this cask. The cask cannot be transferred by crane in the single-failure-proof configuration from the railcar to the cask decontamination area of the Fuel Handling Building (FHB) or returned to the railcar because the redundant lifting yoke cannot fit onto the cask while the cask is on the railcar. The maximum height of the cask while being lifted with a non-redundant yoke is 30 feet. The valve box covers must be removed to provide access to the valves for off-gas venting from the cask. Because the FHB cask decontamination area cannot accommodate installation or removal of the valve box covers, the covers are removed at the rail car and remain off the cask during all movements in the FHB. Lateral movement of the cask into plant equipment with the valve covers removed or a cask drop while the cask is being transferred using a non-redundant lifting yoke could result in damage to the valves, resulting in a release of noble gas and iodine gas activity to the environment. These scenarios create the possibility of a new or different kind of accident not previously evaluated. The consequences of the cask drop scenario would bound any consequences due to impact during lateral movement.

For all of the above reasons, there is a need for a revision to the HBRSEP UFSAR to include the evaluation of a previously unanalyzed spent fuel cask drop scenario to allow the licensee to ship spent fuel using fuel handling procedures that are not currently within the plant's licensing basis.

Environmental Impacts of the Proposed Action:

An evaluation has been performed by the licensee to determine the consequences of a postulated 30 foot cask drop accident with less than full integrity, i.e., with the valve box covers removed. The evaluation determined that, while the fuel components would be retained in the cask, the vent /drain valves may be damaged and thus not be gastight. Using the maximum activity loading for the IF-300 cask, this type of release has been evaluated and the whole body and thyroid doses which could result are a small fraction of those previously analyzed for the fuel handling accident in Section 15.7.3 of the UFSAR. The personnel involved in a cleanup after a postulated accident would need to decontaminate a maximum of one cubic foot of material with a dose rate of up to 10 rem/hr at one meter based on the limit established for the maximum allowable water remaining in the cask after loading operations. Personnel exposure rates could be effectively limited by use of temporary shielding and remote handling tools. The release of activity would not be sufficient to initiate the Control Room radiation alarm or pressurization mode of the Control Room ventilation system. The postulated dose to a Control Room occupant was calculated to be 3.5E-03 rem (whole body) and 7.8E-04 rem (thyroid). Dose assessments were performed using maximum potential releases assuming failure of the spent fuel within the cask and radionuclide release from damage to the valves. Calculated doses at the site boundary were 0.0072 rem (whole body) and 0.1233 rem (thyroid). This evaluation also concluded that it will also bound any consequences of the damage due to an

impact during a lateral movement, since the dose risks would be a fraction of the consequences of cask drop with less than full integrity.

These results have been, in part, independently verified by the NRC staff. The NRC staff also reviewed the assumptions and methods of analysis in the licensee's radiological consequence analysis to ensure they are conservative, bounding, and consistent with the HBRSEP design basis. Based on the above evaluation, the staff concludes that the licensee has demonstrated with reasonable assurance that maximum radiological consequences of dropping an IF-300 cask at the HBRSEP are radiation doses to members of public that are a small fraction of the numerical criteria in 10 CFR Part 100 and are well within the acceptance criteria in the Standard Review Plan and, therefore, are acceptable. The Commission has completed its evaluation of the proposed action and concludes that there will be an insignificant increase in environmental impact on the dose consequences of a spent fuel cask drop with this change in shipping configuration.

The proposed action will not increase the probability or consequences of accidents previously analyzed. No changes are being made in the types of any effluents that may be released off-site and there is no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impact. Therefore, there are no significant nonradiological environmental impacts associated with the proposed action.

Accordingly, the Commission concludes that there are no significant environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

The Spent Fuel Shipping Cask cannot be lifted in the single failure-proof configuration from the cask decontamination area of the FHB to the railcar with this configuration because the redundant lifting yoke cannot fit onto the cask while the cask is on the railcar. Therefore, alternatives to the proposed activity were considered which include (1) designing a new redundant lifting rig and modifying the shipping cask to allow the Spent Fuel Cask Crane to fit onto the cask while the cask is situated on the railcar; (2) modifying the FHB to accommodate installing the valve box covers on the Spent Fuel Shipping Cask in the cask decontamination area before movement of the cask to the railcar; or (3) ceasing spent fuel shipping operations and loading the spent fuel into Independent Spent Fuel Storage Installation (ISFSI) canisters. For the purposes of this review, the alternatives to the proposed action have been evaluated using the dollar value per Person-Rem of \$2000 recommended by NUREG- 1530, "Reassessment of NRC's Dollar Per Person-Rem Conversion Factor Policy." Since the postulated consequences at the Site Boundary have been calculated to be 0.0072 Rem, the proposed change to the UFSAR can be assigned a value of approximately \$15 per person. From the HBRSEP, Unit No. 2 Emergency Plan, the most populous 90° sector out to 10 miles contained a population of 23,210. Therefore, a dollar value of \$350,000 was used for comparison of the proposed activity with its alternatives.

Development of a redundant yoke and modification of the Spent Fuel Cask Crane will involve the design, fabrication, and installation of a one-of-a-kind redundant yoke that can be used for lifts of the Spent Fuel Shipping Cask that include lifting of the cask to the railcar. Modifying the FHB to accommodate installation of the valve box covers prior to lifting the Spent Fuel Shipping Cask from the cask decontamination area to the railcar would involve a major modification to the unit to enclose a larger cask decontamination area within a controlled air

space. It is difficult to provide accurate estimates for the cost of these alternatives because of the numerous variables involved. It is believed that the cost for either of these alternatives will be in excess of \$1,000,000.

As an alternative to the proposed amendment, the staff considered denial of the requested amendment; thus, shipment of spent fuel to SHNPP could be terminated. The result of termination of spent fuel shipment would be to require the storage of additional spent fuel onsite until all existing capacity is used or additional capacity is added to allow continued operation until the termination of the HBRSEP, Unit No. 2, operating license on July 31, 2010. The Spent Fuel Pit has already been racked with high density fuel storage racks, and the addition of storage capacity to the Spent Fuel Pit by further re-racking is not feasible. CP&L maintains an ISFSI license for 8 ISFSI canisters currently containing 56 spent fuel assemblies. No additional capacity is available under the current ISFSI license. The license could be amended to allow additional capacity using a new canister design, or a canister licensed under a general license could be used. The estimated cost of adding sufficient ISFSI storage capacity to permit operation of the unit until the end of the current operating license has been estimated to be approximately \$5,000,000.

The action proposed by the licensee of performing the cask lifting operations between the decontamination facility and the railcar with the valve covers removed and using a non-redundant cask lifting yoke has no significant impact on the environment either from routine operations or from a postulated accident in this configuration. The postulated accident dose is only a small fraction of 10 CFR Part 100 limits and within the acceptance criteria of the Standard Review Plan. Therefore, the benefits of the proposed activity substantially outweigh the costs of the alternatives to the proposed activity. Denial of the application would result in no 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 Related to the Operation of H. B. Robinson."

Agencies and Persons Consulted:

In accordance with its stated policy, on February 17, 1999, the staff consulted with the South Carolina State official, Virgil Autry, South Carolina Department of Health, Bureau of Radiological Health and Environmental Control. The State official had no comments.

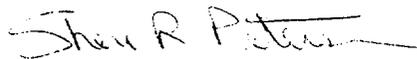
FINDING OF NO SIGNIFICANT IMPACT

On the basis of 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 letters dated August 28, 1997, June 17, 1998, October 29, 1998, and February 11, 1999, which are available for public inspection at the Commission's Public Document Room, which is located at The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Hartsville Memorial Library, 147 West College, Hartsville, South Carolina 29550.

Dated at Rockville, Maryland, this **31st** day of **March** 1999.

FOR THE NUCLEAR REGULATORY COMMISSION



Sheri R. Peterson, Section Chief
Project Directorate II/Section II-2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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