

DEC 28 1984

DOCKET NO: 70-2997
LICENSEE: Carolina Power and Light Company (CP&L)
FACILITY: Shearon Harris Nuclear Power Plant (SHNPP)
Raleigh, North Carolina
SUBJECT: ENVIRONMENTAL ASSESSMENT - LICENSE APPLICATION TO
RECEIVE NEW FUEL

Background

By letter dated April 12, 1984 and supplement dated September 17, 1984, CP&L applied for an NRC license to permit the receipt, possession, and storage of special nuclear material contained in unirradiated nuclear fuel assemblies, fission chambers for core power distribution mapping, and sealed sources for irradiation surveillance capsules. The materials are for eventual use in the SHNPP, Unit 1. In accordance with 10 CFR 51.21, the NRC has prepared this assessment of environmental impacts that may be caused by issuing the requested license. Because of the form and small amount (gram quantities) of nuclear material contained in the incore fission chambers and surveillance capsules, storage of these materials will pose no threat to the environment. Therefore, the discussion below only assesses the environmental impacts potentially resulting from the storage of new fuel assemblies at SHNPP.

The Proposed Action

The proposed action is issuance of a license pursuant to 10 CFR 70 that will authorize CP&L to receive, possess, and store 157 fresh fuel assemblies at the SHNPP. The license has been requested by January 1, 1985 and would be effective until it can be superseded by SHNPP's operating license under 10 CFR 50. The fuel assemblies contain uranium dioxide (UO_2) pellets that have a uranium-235 enrichment of less than 4 percent by weight and are encapsulated in zircaloy tubing. Issuance of the license would result in receipt, possession, inspection, and storage of the unirradiated fuel assemblies at SHNPP. The license would also authorize packaging of the assemblies for the delivery to a carrier if this becomes necessary; however, the transport of new fuel to SHNPP will be the responsibility of the fuel fabricator and is not a part of the proposed action.

Need for the Proposed Action

SHNPP proposes to receive and store fresh fuel prior to issuance of the operating license in order to inspect the assemblies and to finalize fuel preparation

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(e.g., add necessary hardware) needed to load the fuel into the reactor core vessel. Actual core loading, however, will not be authorized by the proposed license. Early completion of this fuel handling stage will help avoid delays in SHNPP's startup once its operating license is issued.

Alternatives to the Proposed Action and Their Environmental Impacts

Alternatives to the proposed action include complete denial of CP&L's application. Assuming SHNPP's operating license will eventually be issued, denial of the storage only license now would merely postpone new fuel receipt at the SHNPP. Such action, as well as any other alternative that can be imagined, would not present an environmental advantage because, as discussed below, no environmental impacts are expected to result from the proposed action.

Environmental Impacts of the Proposed Action

The NRC has already prepared a Final Environmental Statement associated with the full-scale operation of the SHNPP (NUREG-0972). Based on the evaluation in this statement, the environmental impacts of plant operation subject to proposed conditions for environmental protection, are expected to be small. New fuel receipt and storage is only a small part of SHNPP's overall operation that will eventually include handling of irradiated fuel which is significantly more hazardous. Accordingly, the environmental impact from handling unirradiated fuel is expected to be very minor.

Once at the SHNPP, new fuel will be received at the Fuel Handling Building which, under the reactor operating license, will be used to store spent fuel in addition to new fuel. Therefore, this building has been designed to provide acceptable protection against fire and natural phenomena. Except for small amounts of waste that may be generated during new fuel inspections (e.g., smear papers), no radioactive wastes will result from the transfer of fuel from the carrier to the Fuel Handling Building. The small amount of waste that may be produced will be properly packaged and stored until it is shipped to a licensed disposal facility.

In the unlikely event that an assembly is dropped during transfer, the fuel cladding is not expected to rupture. Even if the fuel rod cladding were breached, all handling of the assemblies will take place inside the Fuel Handling Building and any released material will be contained indoors. The fuel pellets are composed of a ceramic UO_2 that has been pelletized and sintered to a very high density. In this form, the generation of UO_2 aerosol is unlikely except under conditions of deliberate grinding. Additionally, UO_2 is soluble only in strong acid solution so dissolution and release to the environment is extremely unlikely.

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All fuel handling activities will be in accordance with approved procedures. Criticality in the New Fuel Storage Pool is precluded by the storage rack design which limits interaction between assemblies. This is accomplished by the presence of neutron absorbing material and by maintaining a minimum separation between assemblies. Further, in the absence of any neutron moderation it is impossible to make an infinite number of these fuel assemblies critical regardless of their spacing. Therefore, even with conservative assumptions, calculations show the proposed fuel handling and storage activities to be critically safe and no environmental impacts from an accidental criticality are expected.

Conclusion

Based upon the information presented above, the environmental impacts associated with new fuel storage at the SHNPP are expected to be insignificant. Essentially no effluents will be released and acceptable controls will be implemented to prevent a criticality accident. Therefore, in accordance with 10 CFR 51.31, a Finding of No Significant Impact is considered appropriate for this action.

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