



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

January 23, 2014

Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
Post Office Box 1295, Bin - 038
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 – ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED TO PROPOSED EXEMPTION TO 10 CFR 50.46 AND 10 CFR 50 APPENDIX K FOR GNF-ZIRON FUEL CLADDING LEAD TEST ASSEMBLIES (TAC NOS. MF1479 and MF1480)

Dear Mr. Pierce:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application, dated April 23, 2013, for an exemption from the fuel cladding requirements in Title 10 of the *Code of Federal Regulations* (CFR), Section 50.46 and 10 CFR 50, Appendix K. Your request was for the purpose of enabling further irradiation of two GE14 Ziron lead test assemblies in the Edwin I. Hatch Nuclear Plant, Unit 1 or Unit 2 for one or more cycles, up to the standard GE14 peak pellet exposure.

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

Sincerely,

A handwritten signature in cursive script that reads "Robert Martin".

Robert Martin, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure:
Environmental Assessment

cc w/encl: Distribution via Listserv

NUCLEAR REGULATORY COMMISSION

Docket Nos. 50-321, 50-366; NRC-20YY-XXXX

Southern Nuclear Operating Company, Inc.

Edwin I. Hatch Nuclear Plant, Units 1 and 2

Environmental Assessment and Finding of No Significant Impact

AGENCY: Nuclear Regulatory Commission.

ACTION: Environmental assessment and finding of no significant impact; issuance.

ADDRESSES: Please refer to Docket ID <NRC-20YY-XXXX> when contacting the NRC about the availability of information regarding this document. You may access information related to this document, which the NRC possesses and are publicly available, using any of the following methods:

- **Federal rulemaking Web site:** Go to <http://www.regulations.gov> and search for Docket ID <NRC-20YY-XXXX>. Address questions about NRC dockets to Carol Gallagher; telephone: 301-287-3422; e-mail: Carol.Gallagher@nrc.gov.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**
You may access publicly available documents online in the NRC Library at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then select "[Begin Web-based ADAMS Search.](#)" For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS accession number for each document referenced in this notice (if that document is available in ADAMS) is provided the first time that a document is referenced. Proposed Exemption to 10 CFR 50.46 and 10 CFR

Appendix K to Allow GNF-Ziron Fuel Cladding, dated April 23, 2013, is available electronically under ADAMS Accession No. ML13115A480.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

SUPPLEMENTARY INFORMATION:

I. Introduction

The U.S. Nuclear Regulatory Commission (NRC or the Commission) is considering issuance of an exemption from Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 46, and Appendix K to Part 50, for Renewed Facility Operating License Nos. NPF-5 and DPR-57, issued to Southern Nuclear Operating Company (SNC), for operation of the Edwin I. Hatch Nuclear Plant, Units 1 and 2 (HNP), located in Appling County, Georgia. Therefore, as required by 10 CFR 51.21, the NRC performed an environmental assessment. Based on the results of the environmental assessment, the NRC is issuing a finding of no significant impact.

II. Environmental Assessment

Identification of the Proposed Action:

The proposed action would allow the use of Ziron fuel cladding in two GE14 lead test fuel assemblies (LTAs) in either HNP, Unit 1 or Unit 2, for one or more additional fuel cycles, up to the standard GE14 peak pellet exposure limit. The proposed action is described in the licensee's application dated April 23, 2013. The proposed action is similar to an action previously approved by the NRC staff (staff) wherein, on November 7, 2008 (ADAMS ML082950149), the staff issued an exemption enabling the use of two GE14 LTAs in Unit 2 of

the HNP for fuel cycles 21, 22 and 23. The Environmental Assessment and Finding of No Significant Impact for that action was published in the *Federal Register* on November 3, 2008 (73 FR 65415). Subsequently, SNC decided not to use those LTAs in Hatch Unit 2 cycle 23. SNC now wishes to continue with irradiation of the two LTAs up to the standard GE14 peak pellet exposure limit, and since the exemption of November 7, 2008 specifically addressed only HNP Unit 2 in fuel cycles 21, 22 and 23, SNC must apply for a further exemption to enable further irradiation of the two LTAs in either of the HNP reactors for one or more additional cycles, up to GNF's approved peak pellet exposure.

The Need for the Proposed Action:

The proposed action would allow the use of two LTAs that will include some fuel rods manufactured with a cladding material, called GNF-Ziron, which is similar in composition to Zircaloy-2, but contains a slightly higher iron content than specified in ASTM B350. Irradiation of LTAs with GNF-Ziron fuel rods will enable SNC to acquire in-reactor operating experience with this material. Pursuant to 10 CFR 50.12, "Specific exemptions," the licensee has requested an exemption from 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," that requires, among other items, that "[e]ach boiling or pressurized light-water nuclear power reactor fueled with uranium oxide pellets within cylindrical zircaloy or ZIRLO cladding must be provided with an emergency core cooling system (ECCS) that must be designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in paragraph (b) of this section." Appendix K to 10 CFR Part 50, "ECCS Evaluation Models," requires, among other items, that the rate of energy release, hydrogen generation, and cladding oxidation from the metal/water reaction shall be calculated using the Baker-Just equation. The regulations at 10 CFR 50.46 and 10 CFR Part

50, Appendix K, make no provisions for use of fuel rods clad in a material other than zircaloy or ZIRLO. The proposed action would allow the licensee to irradiate a small number of LTAs using fuel rods clad with Ziron alloy either in HNP Unit 1 or Unit 2 up to the standard GE14 peak pellet exposure. Since the material specifications of the Ziron alloy differ from the specification for zircaloy or ZIRLO, a plant-specific exemption is required to support the use of the LTAs.

Environmental Impacts of the Proposed Action:

The NRC has completed its safety evaluation of the proposed action and concludes that application of 10 CFR 50.46 and Appendix K to 10 CFR 50, is not necessary to achieve the underlying purpose of the rule.

The details of the NRC staff safety evaluation will be provided in the exemption issued as part of the letter to the licensee approving the exemption to the regulations.

The staff has concluded that such a change would not adversely affect plant safety, and would have no adverse effect on the probability of any accident. For accidents that involve damage or melting of the fuel in the reactor core, the fuel rod integrity of GNF-Ziron clad fuel has been shown to be similar to zircaloy clad fuel; therefore, the consequences of an accident will not be affected. For accidents in which the core remains intact, the use of GNF-Ziron cladding will not have a significant effect on the mix of fission products that could be released in the event of a serious accident; thus, the previously analyzed accident dose consequences remain bounding. Regulatory limits on radiological effluent releases are independent of the type of fuel cladding used. The requirements of 10 CFR 50.36a, Appendix I to 10 CFR Part 50, and 40 CFR Part 190, as well as the plant's Technical Specifications ensure that the release of radioactive gaseous, liquid, and solid waste to unrestricted areas are kept to "as low as is reasonably achievable" (ALARA) levels. The licensee's radioactive waste processing system will collect, control, process to reduce the amount of radioactivity, and

discharge the waste in accordance with regulatory limits. Therefore, the staff concluded that during routine operations, there will be no significant increase of radiological effluents released into the environment as a result of the proposed exemption request. No significant increase in the allowable individual occupational radiation exposure will occur. The impact to workers is not expected to change because radiation exposure will be controlled in accordance with the licensee's radiation protection program, the ALARA program, in-plant shielding, the use of temporary shielding, and engineering controls. The use of GNF-Ziron fuel rods will not change the potential environmental impacts of incident-free transportation of spent nuclear fuel provided the shipping casks are maintained and transported within the Department of Transportation and NRC regulations. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential non-radiological impacts, the proposed action would not change the types or amounts of non-radiological plant effluents. Therefore the proposed action would not result in any foreseeable impacts to land, air, or water resources, including impacts to biota because there would be no change in effluents or emissions into the environment. In addition, there are no known socioeconomic or environmental justice impacts associated with such proposed action because there would be no increase or change in effluents or emissions into the environment that would disproportionately or adversely affect the minority or low income populations. Therefore, there are no significant non-radiological environmental impacts associated with the proposed action.

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

Environmental Impacts of the Alternatives to the Proposed Action:

As an alternative to the proposed action, the staff considered denial of the proposed action (i.e., the “no-action” alternative). 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:

The action does not involve the use of any different resources than those previously considered in NUREG-1437, Supplement 4, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants, regarding the Edwin I. Hatch Nuclear Plant, Units 1 and 2, dated May 31, 2001.

Agencies and Persons Consulted:

On August 13, 2013, the staff notified the State official of Georgia, Mr. Chuck Mueller, of the Department of Natural Resources, regarding the environmental impact of the proposed action. The State official had no comments.

III. Finding of No Significant Impact

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC 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 April 23, 2013.

Dated at Rockville, Maryland, this 23rd day of January, 2014.

For the Nuclear Regulatory Commission.

A handwritten signature in black ink, appearing to read "R. Pascarelli", written in a cursive style.

Robert Pascarelli, Chief,
Plant Licensing Branch II-1,
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.

Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
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