



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

August 16, 2012

Mr. Lawrence J. Weber  
Senior Vice President and  
Chief Nuclear Officer  
Indiana Michigan Power Company  
Nuclear Generation Group  
One Cook Place  
Bridgman, MI 49106

SUBJECT: D. C. COOK NUCLEAR PLANT, UNIT 2 (CNP-2) - ENVIRONMENTAL  
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED TO A  
PROPOSED EXEMPTION TO TITLE 10 OF THE CODE OF FEDERAL  
REGULATIONS, SECTION 50.46 AND APPENDIX K, AND A PROPOSED  
AMENDMENT INVOLVING EXTENDING THE FUEL BURNUP LIMIT (TAC NOS.  
ME7323 AND ME7722)

Dear Mr. Weber:

Enclosed is a copy of the Environmental Assessment (EA) and Finding of No Significant Impact related to your request dated September 29, 2011, as supplemented on July 25, 2012, for an exemption to certain requirements concerning fuel cladding material in Title 10 of the *Code of Federal Regulations*, Section 50.46, and Appendix K, and for an amendment to permit use of Optimized ZIRLO™ fuel design. The EA updates the CNP-2 environmental record to accommodate a fuel burnup limit of 62 gigawatt-days per metric ton uranium.

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

Sincerely,

A handwritten signature in black ink, which appears to read "Peter S. Tam".

Peter S. Tam, Senior Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-316

Enclosure: Environmental Assessment

cc w/encl: Distribution via ListServ

NUCLEAR REGULATORY COMMISSION

INDIANA MICHIGAN POWER COMPANY

[NRC-2012- ]

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT 2

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The Nuclear Regulatory Commission (NRC or the Commission) is considering issuance of an exemption and an amendment to Renewed Facility Operating License No. DPR-74, issued to Indiana Michigan Power Company (the licensee), for operation of Donald C. Cook Nuclear Plant, Unit 2 (CNP-2), located in Berrien County, Michigan, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Sections 50.12 and 50.90. In accordance with 10 CFR 51.21, the NRC performed an environmental assessment documenting its findings as follows.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Actions:

The proposed actions would issue an exemption from certain requirements of 10 CFR, Section 50.46 and Appendix K, regarding fuel cladding material, and revise the Technical Specifications document, which is Appendix A to Renewed Facility Operating License DPR-74, to permit use of a Westinghouse proprietary material, Optimized ZIRLO™, for fuel rod cladding. The licensee will be authorized to a peak load average burnup limit of 62 gigawatt-days per metric ton uranium (GWD/MTU).

The proposed actions are in accordance with the licensee's application dated September 29, 2011, as supplemented on July 25, 2012.

The Need for the Proposed Actions:

The proposed actions to issue an exemption to the fuel cladding requirement of 10 CFR Section 50.46 and Appendix K, and to amend the Technical Specifications to permit use of Optimized ZIRLO™ clad fuel rods to a peak rod average burnup limit of 62 GWD/MTU would allow for more effective fuel management. If the exemption and amendment are not approved, the licensee will not be provided the opportunity to use Optimized ZIRLO™ fuel design with a peak rod average burnup as high as 62 GWD/MTU; the licensee would thus lose fuel management flexibility.

Environmental Impacts of the Proposed Actions:

In this environmental assessment regarding the impacts of the use of Optimized ZIRLO™ clad fuel with the possible burnup up to 62 GWD/MTU, the Commission is relying on the results of the updated study conducted for the NRC by the Pacific Northwest National Laboratory (PNNL), entitled "Environmental Effects of Extending Fuel Burnup Above 60 GWD/MTU" (NUREG/CR-6703, PNNL-13257, January 2001). Environmental impacts of high burnup fuel up to 75 GWD/MTU were evaluated in the study, but some aspects of the review were limited to evaluating the impacts of the extended burnup up to 62 GWD/MTU, because of the need for additional data on the effect of extended burnup on gap release fractions. All the aspects of the fuel-cycle were considered during the study, from mining, milling, conversion, enrichment and fabrication through normal reactor operation, transportation, waste management, and storage of spent fuel.

The amendment and exemption would allow CNP-2 to use Optimized ZIRLO™ clad fuel up to a burnup limit of 62 GWD/MTU. The NRC staff has completed its evaluation of the proposed actions and concludes that such changes would not adversely affect plant safety,

and would have no adverse effect on the probability of any accident. For the accidents that involve damage or melting of the fuel in the reactor core, fuel rod integrity has been shown to be unaffected by extended burnup under consideration; therefore, the consequences of an accident will not be affected by fuel burnup to 62 GWD/MTU. For the accidents in which the reactor core remains intact, the increased burnup may slightly change the mix of fission products that could be released, but because the radionuclides contributing most to the dose are short-lived, increased burnup would not have an effect on the consequences beyond the consequences of previously evaluated accident scenarios. Thus, there will be no significant increase in projected dose consequences of postulated accidents associated with fuel burnup up to 62 GWD/MTU, and doses will remain well below regulatory limits.

Regulatory limits on radiological effluent releases are independent of burnup. The requirements of 10 CFR Part 20, 10 CFR 50.36a, and Appendix I to 10 CFR Part 50 ensure that routine releases of gaseous, liquid or solid radiological effluents to unrestricted areas is kept "As Low As is Reasonably Achievable." Therefore, the NRC staff concludes that during routine operations, there would be no significant increase in the amount of gaseous radiological effluents released into the environment as a result of the proposed actions, nor will there be a significant increase in the amount of liquid radiological effluents or solid radiological effluents released into the environment.

The proposed actions will not change normal plant operating conditions (i.e., no changes are expected in the fuel handling, operational, or storing processes). The fuel storage and handling, radioactive waste, and other systems which may contain radioactivity are designed to assure adequate safety under normal conditions. There will be no significant changes in radiation levels during these evolutions, and no significant increase in the allowable individual or cumulative occupational radiation exposure is expected to occur.

The use of Optimized ZIRLO™ clad fuel with a burnup limit of 62 GWD/MTU will not change the potential environmental impacts of incident-free transportation of spent nuclear fuel or the accident risks associated with spent fuel transportation if the fuel is cooled for 5 years after being discharged from the reactor. A PNNL report for the NRC (NUREG/CR-6703, January 2001) concluded that doses associated with incident-free transportation of spent fuel with burnup to 75 GWD/MTU are bound by the doses given in 10 CFR 51.52, Table S-4 for all regions of the country, based on the dose rates from the shipping casks being maintained within regulatory limits. Increased fuel burnup will decrease the annual discharge of fuel to the spent fuel pool which will postpone the need to remove spent fuel from the pool.

NUREG/CR-6703 determined that no increase in environmental effects of spent fuel transportation accidents is expected as a result of increasing fuel burnup to 75 GWD/MTU.

Based on the nature of the amendment and exemption, these proposed actions do not result in changes to land use or water use, or result in changes to the quality or quantity of non-radiological effluents. No changes to the National Pollution Discharge Elimination System permit are needed. No effects on the aquatic or terrestrial habitat in the vicinity or the plant, or to threatened, endangered, or protected species under the Endangered Species Act, or impacts to essential fish habitat covered by the Magnuson-Stevens Act are expected. There are no impacts to the air or ambient air quality. There are no impacts to historic and cultural resources. There would be no noticeable effect on socioeconomic conditions in the region. Therefore, no changes or different types of non-radiological environmental impacts are expected as a result of the proposed actions. Accordingly, the NRC staff concludes that there are no significant environmental impacts associated with the proposed actions.

For more detailed information regarding the environmental impacts of extended fuel burnup, please refer to the study conducted by PNNL for the NRC, entitled "Environmental Effects of Extending Fuel Burnup Above 60 GWD/MTU" (NUREG/CR-6073, PNNL-13257, January 2001, Accession No. ML010310298). The NRC staff's detailed safety review will be conveyed in the Safety Evaluation issued concurrently with the amendment.

Environmental Impacts of the Alternatives to the Proposed Actions:

As an alternative to the proposed actions, the NRC staff considered denial of the proposed actions (i.e., the "no-action" alternative). Denial of the application would result in no change in current environmental impacts. Thus, the environmental impacts of the proposed actions and the alternative action are similar.

Alternative Use of Resources:

The proposed actions do not involve the use of any different resources than those previously considered in the Final Environmental Statement for Donald C. Cook Nuclear Plant, Unit 2, or the Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2 – Final Report (NUREG-1437, Supplement 20), dated May 2005.

Agencies and Persons Consulted:

In accordance with its stated policy, on June 1, 2012, the NRC staff consulted with the Michigan State official regarding the environmental impact of the proposed action. The State officials had no comments.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the NRC staff concludes that the proposed actions will not have a significant effect on the quality of the human environment. Accordingly, the NRC staff determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed actions, see the licensee's letters dated September 29, 2011, and July 25, 2012. Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available documents created or received at the NRC are accessible electronically from the ADAMS Public Electronic Reading Room on the Internet at the NRC Website, <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or send an e-mail to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov).

Dated at Rockville, Maryland, this 16th day of August, 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Peter S. Tam". The signature is stylized with a large, looped initial "P" and a long, sweeping underline.

Peter S. Tam, Senior Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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