

May 25, 2006

Mr. Christopher M. Crane, President  
and Chief Nuclear Officer  
Exelon Generation Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2 - ENVIRONMENTAL ASSESSMENT AND  
FINDING OF NO SIGNIFICANT IMPACT OF THE EXEMPTION FROM  
CLADDING MATERIAL SPECIFIED IN 10 CFR 50.44, 10 CFR 50.46, AND  
10 CFR PART 50, APPENDIX K (TAC NOS. MC8517 AND MC8518)

Dear Mr. Crane:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption dated September 23, 2005. The proposed exemption would allow the Byron Station, Units 1 and 2, to use lead test assemblies containing AXIOM™ cladding material.

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

Sincerely,

*/RA/*

Robert F. Kuntz, Project Manager  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454 and STN 50-455

Enclosure:  
Environmental Assessment

cc w/encl: See next page

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
EXELON GENERATION COMPANY, LLC  
DOCKET NOS. STN 50-454 AND STN 50-455  
BYRON STATION, UNIT NOS. 1 AND 2  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an exemption from Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.44, 10 CFR 50.46, and 10 CFR Part 50, Appendix K, for Facility Operating Licenses Nos. NPF-37 and NPF-66, issued to Exelon Generation Company, LLC (Exelon, the licensee), for operation of Byron Station, Units 1 and 2, located in Ogle County, Illinois. Therefore, as required by 10 CFR 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would allow the licensee to place four lead test assemblies containing a limited number of AXIOM™ fuel rods into the Byron Station, Unit 1, core during the fall 2006 refueling outage. The four lead test assemblies will be placed in non-limiting core locations. For subsequent cycles, two of the lead test assemblies will be placed into Byron Station, Unit 2, and two lead test assemblies will remain in Byron Station, Unit 1.

The proposed action is in accordance with the licensee's application dated September 23, 2005.

The Need for the Proposed Action:

Pursuant to 10 CFR 50.12, "Specific exemptions," Exelon has requested exemptions from 10 CFR 50.44, "Combustible gas control for nuclear power reactors," 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems [EECS] for light-water nuclear power reactors," and Appendix K to 10 CFR Part 50, "ECCS Evaluation Models." The regulation at 10 CFR 50.44 specifies requirements for the control of hydrogen gas generated after a postulated loss-of-coolant accident (LOCA) for reactors fueled with zirconium-clad fuel. Section 50.46 contains acceptance criteria for ECCS for reactors fueled with zircaloy or ZIRLO™ clad fuel. In addition, Appendix K to 10 CFR Part 50 requires that the Baker-Just equation be used to predict the rates of energy release, hydrogen concentration, and cladding oxidation from the metal-water reaction.

The exemption request relates solely to the specific types of cladding material specified in these regulations. As written, the regulations presume the use of zircaloy or ZIRLO™ fuel rod cladding. Thus, an exemption from the requirements of 10 CFR 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 is needed to irradiate lead test assemblies employing AXIOM™ developmental clad alloys at Byron Station, Units 1 and 2.

The proposed action will use the irradiation of the lead test assemblies incorporating the developmental cladding to provide data on fuel and material performances to support future licensing activities.

Environmental Impacts of the Proposed Action:

The NRC has completed its safety evaluation of the proposed action and concludes that specific application of the limitations on fuel cladding material in 10 CFR 50.44, 10 CFR 50.46, and 10 CFR Part 50 Appendix K to the lead test assemblies is not necessary for the licensee to achieve their underlying purposes. In addition, the NRC staff has determined that, pursuant to

10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to public health and safety, and is consistent with the common defense and security.

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

The proposed action will not significantly increase the probability or consequences of accidents. No changes are being made in the types of effluents that may be released off site. There is no significant increase in the amount of any effluent released off site. There is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential non-radiological impacts, the proposed action does not have a potential to affect any historic sites. It does not affect non-radiological plant effluents and has no other environmental impact. 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 NRC 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 the Final Environmental Statement for Byron Station, Units 1 and 2, NUREG-0848, dated April 1982.

Agencies and Persons Consulted:

In accordance with its stated policy, on April 7, 2006, the NRC staff consulted with the Illinois State official, Mr. Frank Niziolek of the Illinois Emergency Management Agency, regarding the environmental impact of the proposed action. The State official had no comments.

#### 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 September 23, 2005. 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 records will be accessible electronically from the Agencywide Documents Access and Management System (ADAMS) Public Electronic Reading Room on the Internet at the NRC Web site, <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

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NRC PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or send an e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

Dated at Rockville, Maryland, this 25th day of May 2006.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Robert F. Kuntz, Project Manager  
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Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Byron Station Units 1 and 2

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Byron Station Units 1 and 2

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