

August 29, 2000

Mr. James A. Hutton
Director-Licensing
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control
P. O. Box No. 160
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION, UNIT 1 - ENVIRONMENTAL
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT REGARDING
EXEMPTION REQUESTS TO USE THE AMERICAN SOCIETY OF
MECHANICAL ENGINEERS (ASME) CODE CASES N-588 AND N-640 FOR
GENERATION OF THE UPDATED PRESSURE-TEMPERATURE LIMIT
CURVES (TAC NO. MA8954)

Dear Mr. Hutton:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your May 15, 2000, application for an exemption from the requirements in 10 CFR Part 50, Appendix G, for generating the pressure-temperature (P-T) limit curves for Limerick Generating Station, Unit 1. The new P-T limits were developed using the methodologies in the ASME Code Cases N-588, "Alternative to Reference Flaw Orientation of Appendix G for Circumferential Welds in Reactor Vessels, Section XI, Division I," and N-640, "Alternate Reference Fracture Toughness for Development of P-T Limit Curves for ASME Section XI, Division I," instead of using the methodologies in 10 CFR Part 50, Appendix G. A non-proprietary version of attachment 6 to the May 15, 2000, application was submitted by letter dated May 19, 2000.

Sincerely,

/RA/

Bartholomew C. Buckley, Sr. Program Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-352

Enclosure: Environmental Assessment

cc w/encl: See next page

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Dear Mr. Hutton:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your May 15, 2000, application for an exemption from the requirements in 10 CFR Part 50, Appendix G, for generating the pressure-temperature (P-T) limit curves for Limerick Generating Station, Unit 1. The new P-T limits were developed using the methodologies in the ASME Code Cases N-588, "Alternative to Reference Flaw Orientation of Appendix G for Circumferential Welds in Reactor Vessels, Section XI, Division I," and N-640, "Alternate Reference Fracture Toughness for Development of P-T Limit Curves for ASME Section XI, Division I," instead of using the methodologies in 10 CFR Part 50, Appendix G. A non-proprietary version of attachment 6 to the May 15, 2000, application was submitted by letter dated May 19, 2000.

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UNITED STATES NUCLEAR REGULATORY COMMISSION

PECO ENERGY COMPANY

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an exemption from certain requirements of 10 CFR 50.60(a) for Facility Operating License No. NPF-39, issued to PECO Energy Company (PECO, or the licensee) for operation of the Limerick Generating Station, Unit 1 (Limerick Unit 1), located in Montgomery and Chester Counties in Pennsylvania.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

Appendix G to Title 10 of the *Code of Federal Regulations*, Part 50 (10 CFR Part 50, Appendix G), requires that pressure-temperature (P-T) limits be established for reactor pressure vessels (RPVs) during normal operating and hydrostatic or leak rate testing conditions. Specifically, 10 CFR Part 50, Appendix G, states, "The appropriate requirements on both the pressure-temperature limits and the minimum permissible temperature must be met for all conditions." Appendix G of 10 CFR Part 50 specifies that the requirements for these limits are the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Appendix G, limits.

To address provisions of amendments to the technical specifications' P-T limits, the licensee requested in its submittal dated May 15, 2000, as supplemented May 19, 2000, that

the staff exempt Limerick Unit 1 from application of specific requirements of 10 CFR Part 50, Section 50.60(a) and Appendix G, and substitute use of ASME Code Cases N-588 and N-640. Code Case N-588 permits the postulation of a circumferentially-oriented flaw (in lieu of an axially-oriented flaw) for the evaluation of the circumferential welds in RPV P-T limit curves. Code Case N-640 permits the use of an alternate reference fracture toughness (K_{IC} fracture toughness curve instead of K_{Ia} fracture toughness curve) for reactor vessel materials in determining the P-T limits. Since the pressure stresses on a circumferentially-oriented flaw are lower than the pressure stresses on an axially-oriented flaw by a factor of two, using Code Case N-588 for establishing the P-T limits would be less conservative than the methodology currently endorsed by 10 CFR Part 50, Appendix G, and therefore, an exemption to apply the Code Case would be required by 10 CFR 50.60. Likewise, since the K_{IC} fracture toughness curve shown in ASME Code, Section XI, Appendix A, Figure A-2200-1 (the K_{IC} fracture toughness curve) provides greater allowable fracture toughness than the corresponding K_{Ia} fracture toughness curve of ASME Code, Section XI, Appendix G, Figure G-2210-1 (the K_{Ia} fracture toughness curve), using Code Case N-640 for establishing the P-T limits would be less conservative than the methodology currently endorsed by 10 CFR Part 50, Appendix G, and therefore, an exemption to 10 CFR 50.60 to apply the Code Case would also be required.

The proposed action is in accordance with the licensee's application for exemption dated May 15, 2000, as supplemented May 19, 2000.

The Need for the Proposed Action:

ASME Code Case N-640 is needed to revise the method used to determine the reactor coolant system (RCS) P-T limits, since continued use of the present curves unnecessarily restricts the P-T operating window. Since the RCS P-T operating window is defined by the P-T operating and test limit curves developed in accordance with the ASME Code, Section XI, Appendix G, procedure, continued operation of Limerick Unit 1 with these P-T curves without

the relief provided by ASME Code Case N-640 would unnecessarily require the RPV to maintain a temperature exceeding 212 °F in a limited operating window during the pressure test. Consequently, steam vapor hazards would continue to be one of the safety concerns for personnel conducting inspections in primary containment. Implementation of the proposed P-T curves, as allowed by ASME Code Case N-640, does not significantly reduce the margin of safety and would eliminate steam vapor hazards by allowing inspections in primary containment to be conducted at a lower coolant temperature.

ASME Code Case N-588 allows a licensee to postulate a circumferential flaw in circumferential RPV welds in lieu of the axial flaw that is normally assumed to be present by the ASME Code, Section XI, Appendix G, analysis. The staff has determined that the assumption of an axial flaw in a circumferential RPV shell weld would provide an overly-conservative margin of safety on stress intensities resulting from the operating pressure, and that postulation of a circumferential flaw in the circumferential welds would continue to satisfy the margin of safety of two required by Appendix G to Section XI of the ASME Code.

In the requests for exemptions to use Code Cases N-588 and N-640, the staff has determined that, pursuant to 10 CFR 50.12(a)(2)(ii), the underlying purpose of the regulation will continue to be served by the implementation of these Code Cases.

Environmental Impacts of the Proposed Action:

The NRC has completed its evaluation of the proposed action and concludes that the exemption described above would provide an adequate margin of safety against brittle failure of the Limerick Unit 1 RPV.

The proposed action will not significantly increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released offsite, and 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 nonradiological environmental impacts, the proposed action does not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impacts. Therefore, there are no significant nonradiological impacts associated with the proposed action.

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

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:

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for the Limerick Generating Station, Units 1 and 2, dated April 1984.

Agencies and Persons Consulted:

In accordance with its stated policy, on August 7, 2000, the staff consulted with the Pennsylvania State official, David Ney of the Pennsylvania Department of Environmental Protection, 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 May 15, 2000, as supplemented by letter dated May 19, 2000, which are available for public inspection at the NRC Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC. Publicly available records will be accessible electronically from the ADAMS Public Library component on the NRC Web site, <http://www.nrc.gov> (the Electronic Reading Room).

Dated at Rockville, Maryland, this 29th day of August, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Bartholomew C. Buckley, Sr. Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Limerick Generating Station, Units 1 & 2

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