

July 11, 1996

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: BYRON STATION, UNITS 1 AND 2 (TAC NOS. M95493 AND M95494)

Dear Mr. Farrar:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption dated March 14, 1996. The proposed exemption would allow Byron Station, Units 1 and 2, to utilize the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Case N-514, "Low Temperature Overpressure Protection" to determine its low temperature overpressure protection setpoints.

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

Sincerely,

Original signed by:

George F. Dick, Jr., Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

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

Enclosure: Environmental Assessment

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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A handwritten signature in cursive script that reads "George F. Dick, Jr.".

George F. Dick, Jr., Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

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

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cc w/encl: See next page

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Commonwealth Edison Company

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Unit Nos. 1 and 2

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UNITED STATES NUCLEAR REGULATORY COMMISSIONCOMMONWEALTH EDISON COMPANYDOCKET NOS. STN 50-454 AND STN 50-455BYRON STATION, UNITS 1 AND 2ENVIRONMENTAL ASSESSMENT AND FINDING OFNO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from certain requirements of its regulations to Facility Operating License Nos. NPF-37 and NPF-66, issued to Commonwealth Edison Company (ComEd, the licensee), for operation of Byron Station, Units 1 and 2, located in Ogle County, Illinois.

ENVIRONMENTAL ASSESSMENTIdentification of the Proposed Action:

The proposed action would allow the licensee to utilize the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Case N-514, "Low Temperature Overpressure Protection" to determine its low temperature overpressure protection (LTOP) setpoints and is in accordance with the licensee's application for exemption dated March 14, 1996. The proposed action requests an exemption from certain requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation," to allow application of an alternate methodology to determine the LTOP setpoints for Byron Station, Units 1 and 2. The proposed alternate methodology is consistent with guidelines developed by the ASME Working Group on Operating Plant Criteria (WGOPC) to define pressure limits during LTOP events that avoid certain unnecessary operational

restrictions, provide adequate margins against failure of the reactor pressure vessel, and reduce the potential for unnecessary activation of pressure relieving devices used for LTOP. These guidelines have been incorporated into Code Case N-514, "Low Temperature Overpressure Protection," which has been approved by the ASME Code Committee. The content of this Code Case has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI. However, 10 CFR 50.55a, "Codes and Standards," and Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability" have not been updated to reflect the acceptability of Code Case N-514.

The philosophy used to develop Code Case N-514 guidelines is to ensure that the LTOP limits are still below the pressure/temperature (P/T) limits for normal operation, but allow the pressure that may occur with activation of pressure relieving devices to exceed the P/T limits, provided acceptable margins are maintained during these events. This philosophy protects the pressure vessel from LTOP events, and still maintains the Technical Specifications P/T limits applicable for normal heatup and cooldown in accordance with 10 CFR Part 50, Appendix G and Sections III and XI of the ASME Code.

The Need for the Proposed Action:

Pursuant to 10 CFR 50.60, all lightwater nuclear power reactors must meet the fracture toughness requirements for the reactor coolant pressure boundary as set forth in 10 CFR Part 50, Appendix G. 10 CFR Part 50, Appendix G, defines P/T limits during any condition of normal operation including anticipated operational occurrences and system hydrostatic tests, to

which the pressure boundary may be subjected over its service lifetime. It is specified in 10 CFR 50.60(b) that alternatives to the described requirements in 10 CFR Part 50, Appendix G, may be used when an exemption is granted by the Commission under 10 CFR 50.12.

To prevent transients that would produce excursions exceeding the 10 CFR Part 50, Appendix G, P/T limits while the reactor is operating at low temperatures, the licensee installed an LTOP system. The LTOP system includes pressure relieving devices in the form of Power Operated Relief Valves (PORVs) that are set at a pressure below the LTOP enabling temperature that would prevent the pressure in the reactor vessel from exceeding the P/T limits of 10 CFR Part 50, Appendix G. To prevent these valves from lifting as a result of normal operating pressure surges (e.g., reactor coolant pump starting and shifting operating charging pumps) with the reactor coolant system in a solid water condition, the operating pressure must be maintained below the PORV setpoint.

In addition, to prevent damage to reactor coolant pump seals, the operator must maintain a minimum differential pressure across the reactor coolant pump seals. Hence, the licensee must operate the plant in a pressure window that is defined as the difference between the minimum required pressure to start a reactor coolant pump and the operating margin to prevent lifting of the PORVs due to normal operating pressure surges. The 10 CFR Part 50, Appendix G, safety margin adds instrument uncertainty into the LTOP setpoint. The licensee's current LTOP analysis indicates that using this 10 CFR Part 50, Appendix G, safety margin to determine the PORV setpoint would result in an operating window between the LTOP setpoint and the minimum pressure required

for reactor coolant pump seals which is significantly restricted when physical conditions such as PORV overshoot, RCP pump Δ Ps, and static head corrections are taken into account in setpoint determination. Operating with these limits could result in the lifting of the PORVs or damage to the reactor coolant pump seals during normal operation. Using Code Case N-514 would allow the licensee to recapture most of the operating margin that is lost by factoring in the instrument uncertainties in the determination of the LTOP setpoint. The net effect of using Code Case N-514 is that the setpoint will not change significantly with the next setpoint analysis. Therefore, the licensee proposed that in determining the PORV setpoint for LTOP events for Byron, the allowable pressure be determined using the safety margins developed in an alternate methodology in lieu of the safety margins required by 10 CFR Part 50, Appendix G. The alternate methodology is consistent with ASME Code Case N-514. The content of this Code Case has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI.

An exemption from 10 CFR 50.60 is required to use the alternate methodology for calculating the maximum allowable pressure for LTOP considerations. By application dated March 14, 1996, the licensee requested an exemption from 10 CFR 50.60 to allow it to utilize the alternate methodology of Code Case N-514 to compute its LTOP setpoints.

Environmental Impacts of the Proposed Action:

Appendix G of the ASME Code requires that the P/T limits be calculated:
(a) using a safety factor of two on the principal membrane (pressure) stresses, (b) assuming a flaw at the surface with a depth of one quarter (1/4)

of the vessel wall thickness and a length of six (6) times its depth, and (c) using a conservative fracture toughness curve that is based on the lower bound of static, dynamic, and crack arrest fracture toughness tests on material similar to the Byron reactor vessel material.

In determining the PORV setpoint for LTOP events, the licensee proposed the use of safety margins based on an alternate methodology consistent with the proposed ASME Code Case N-514 guidelines. ASME Code Case N-514 allows determination of the setpoint for LTOP events such that the maximum pressure in the vessel will not exceed 110% of the P/T limits of the existing ASME Appendix G. This results in a safety factor of 1.8 on the principal membrane stresses. All other factors, including assumed flaw size and fracture toughness, remain the same. Although this methodology would reduce the safety factor on the principal membrane stresses, use of the proposed criteria will provide adequate margins of safety to the reactor vessel during LTOP transients.

The change will not 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 the allowable individual or cumulative occupational radiation exposure. Accordingly, the Commission concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does involve features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Accordingly, the Commission concludes that

there are no significant nonradiological environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

Since the Commission has concluded there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. As an alternative to the proposed action, the staff considered denial of the proposed action. 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 Byron Station, Units 1 and 2.

Agencies and Persons Consulted:

In accordance with its stated policy, on June 19, 1996, the staff consulted with the Illinois State official, Mr. Frank Niziolek; Head, Reactor Safety Section; Division of Engineering; Illinois Department of Nuclear Safety; regarding the environmental impact of the proposed action. The State official had no comments.

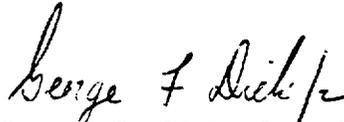
FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission 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 March 14, 1996, which is available for public inspection at the Commission's Public Document Room, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Byron Public Library District 109 N. Franklin, P. O. Box 434, Byron, Illinois 61010.

Dated at Rockville, Maryland, this 11th day of July 1996.

FOR THE NUCLEAR REGULATORY COMMISSION



George F. Dick, Jr., Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation