

Mr. Garry L. Randolph
 Vice President and Chief Nuclear Officer
 Union Electric Company
 Post Office Box 620
 Fulton, Missouri 65251

March 30, 1998

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 50.60 -
 CALLAWAY PLANT, UNIT 1 (TAC NO. M99607)

Dear Mr. Randolph:

By letter dated August 22, 1997, Union Electric Company (UE) submitted a request for an exemption from certain requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation." This section requires all power reactors to meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary set forth in Appendices G and H to 10 CFR Part 50. The exemption would allow UE to apply American Society for Mechanical Engineers (ASME) Code Case N-514 for determining Callaway's cold overpressurization mitigation system (COMS) pressure setpoint.

Based upon the information provided, there is reasonable assurance that, based on the conservatism which is explicitly in Appendix G methodology, permitting the COMS setpoint to be established such that the vessel pressure would not exceed 110 percent of the limit defined by the P-T limit curves provides an adequate margin of safety against brittle failure of the reactor vessel. The staff further agrees that limiting the potential for inadvertent COMS actuation may improve plant safety.

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 50.12, has issued the enclosed exemption for Callaway Plant, Unit 1. A copy of the exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original Signed By
 Barry C. Westreich, Project Manager
 Project Directorate IV-2
 Division of Reactor Projects III/IV
 Office of Nuclear Reactor Regulation

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Docket No. 50-483

Enclosure: Exemption

cc w/encl: See next page

*For previous concurrences see
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
UNION ELECTRIC COMPANY) Docket No. 50-483
)
(Callaway Plant, Unit 1))

EXEMPTION

I.

Union Electric Company (UE or the licensee) is the holder of Facility Operating License No. NPF-30, which authorizes operation of the Callaway Plant, Unit 1. The license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now and hereafter in effect.

The facility is a pressurized water reactor located at the licensee's site in Callaway County, Missouri.

II.

Section 50.60(a) to 10 CFR Part 50 requires that except as provided in Section 50.60(b), all light-water nuclear power reactors, other than reactor facilities for which the certifications required under Section 50.82(a)(1) have been submitted, must meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary set forth in Appendices G and H of 10 CFR Part 50. Section 50.60(b) of 10 CFR Part 50 states that proposed alternatives to the described requirements of Appendices G and H

of Part 50 or portions thereof may be used when an exemption is granted by the Commission under 10 CFR 50.12

III.

By letter dated August 22, 1997, Union Electric Company requested that the NRC exempt the Callaway Plant, Unit 1 from the application of specific requirements of 10 CFR 50.60 and Appendix G to 10 CFR Part 50. Specifically, Union Electric proposes to use American Society for Mechanical Engineers (ASME) Code Case N-514 to permit setting the pressure setpoint of Callaway's cold overpressure mitigation system (COMS) such that the pressure-temperature (P-T) limits required by Appendix G of 10 CFR Part 50 could be exceeded by ten percent during a low temperature pressure transient.

The Commission has established requirements in 10 CFR Part 50 to protect the integrity of the reactor coolant system pressure boundary. As a part of these, Appendix G of 10 CFR Part 50 requires that P-T limits be established for reactor pressure vessels (RPVs) during normal operation and vessel hydrostatic testing. As stated in Appendix G, "The appropriate requirements on...the pressure-temperature limits...must be met for all conditions." In order to avoid approaching these P-T limit curves and provide pressure relief during low temperature overpressurization events, pressurized water reactor licensees have installed protection systems (COMS/LTOPS) as part of the reactor coolant system pressure boundary. Union Electric is required as part of the Callaway Plant Technical Specifications (TS) to develop, update, and submit reactor vessel P-T limits and COMS setpoints for NRC review and approval.

Union Electric determined that the exemption request from the provisions of 10 CFR 50.60 and Appendix G was necessary since these regulations require, as noted above, that reactor vessel conditions not exceed the P-T limits established by Appendix G. In referring to

10 CFR 50.12 on specific exemptions, Union Electric cited special circumstances regarding achievement of the underlying purpose of the regulation as their basis for requesting this exemption [10 CFR 50.12(a)(2)(ii)].

Union Electric noted in support of the 10 CFR 50.12(a)(2)(ii) criteria that the underlying purpose of the subject regulation is to establish limits to protect the reactor vessel from brittle failure during low temperature operation and that the COMS provides a physical means of assuring operation remains within these limits. Union Electric proposed that establishing the COMS pressure setpoint in accordance with the N-514 provisions, such that the vessel pressure would not exceed 110 percent of the P-T limit allowables, would still provide an acceptable level of safety and mitigate the potential for an inadvertent actuation of the COMS. The use of N-514 was based on the conservatisms which have been explicitly incorporated into the procedure for developing the P-T limit curves. This procedure, referenced from Appendix G to Section XI of the ASME Code, includes the following conservatisms: (1) a safety factor of 2 on the pressure stresses; (2) a margin factor applied to RT_{NDT} using Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials;" (3) an assumed 1/4 T flaw with a 6:1 aspect ratio; and (4) a limiting material toughness based on dynamic and crack arrest data.

In addition, Union Electric stated that a COMS pressure setpoint should "also be high enough to prevent the inadvertent actuation of the COMS as a result of normal operating pressure surges. Application of the various instrument and calculational uncertainties has resulted in a COMS actuation setpoint that established an operating window that is too narrow

to permit reasonable system makeup and pressure control." Such an inadvertent actuation could lead to the unnecessary release of reactor coolant inside containment and could introduce undesirable thermal transients in the RCS.

The Commission has determined that application of 10 CFR 50.60 in these particular circumstances is not necessary to achieve the underlying purpose of that rule and that the use of Code Case N-514 would meet the underlying intent of the regulation. Based upon a consideration of the conservatisms which are explicitly defined in the Appendix G methodology, it was concluded that permitting the COMS setpoint to be established such that the vessel pressure would not exceed 110 percent of the limit defined by the P-T limit curves would provide an adequate margin of safety against brittle failure of the reactor vessel. This is also consistent with the determination that has been reached for other licensees under similar conditions based on the same considerations. Therefore, the exemption requested under the special circumstances of 10 CFR 50.12(a)(2)(ii) was found to be acceptable. The staff also agrees that limiting the potential for inadvertent COMS actuation may improve plant safety.

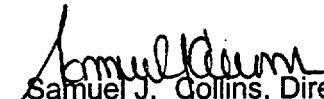
IV.

The Commission has determined that, pursuant to 10 CFR 50.12, this exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby grants Union Electric Company an exemption from the requirements of 10 CFR 50.60 in order to apply ASME Code Case N-514 for determining the Callaway plant's cold overpressurization mitigation system pressure setpoint.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment (63 FR 14739).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 30th day of March 1998