

June 15, 2006

Mr. Charles D. Naslund  
Senior Vice President and Chief Nuclear Officer  
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Post Office Box 620  
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 - THIRD 10-YEAR INTERVAL INSERVICE  
INSPECTION PROGRAM RELIEF REQUEST I3R-02 (TAC NO. MD1157)

Dear Mr. Naslund:

By letter dated March 28, 2006 (ULNRC-05271), the Union Electric Company (the licensee) requested relief for the third 10-year inservice inspection (ISI) interval at the Callaway Plant (Callaway). Included in the submittal were the following three relief requests (RRs): I3R-01, I3R-02, and I3R-04. This letter only addresses RR I3R-02.

In the enclosed safety evaluation (SE), the Nuclear Regulatory Commission (NRC) staff has evaluated the information provided by the licensee in its letter dated March 28, 2006, for RR I3R-02 for Callaway. Based on the SE, the NRC staff concludes that the licensee's proposed alternative in RR I3R-02 to use American Society of Mechanical Engineers (ASME) Code Case N-700 for welded attachments on vessels provides an acceptable level of quality and safety. Therefore, RR I3R-02 is authorized pursuant to paragraph 55.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR 55.55a(a)(3)(i)) for the third 10-year ISI interval or until Code Case N-700 is approved for general use by reference in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," and incorporated by reference in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing the code case, it must follow all provisions of Code Case N-700 with conditions as specified in Regulatory Guide 1.147 and limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6), if any. All other requirements of the ASME Code, Sections III and XI, for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

David Terao, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NO. I3R-02

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

## 1.0 INTRODUCTION

By application dated March 28, 2006 (Agencywide Documents Access and Management System Accession No. ML061010704), Union Electric Company (the licensee) requested relief for the third inservice inspection (ISI) interval at the Callaway Plant (Callaway). Included in the submittal were the following three relief requests (RRs): I3R-01, I3R-02, and I3R-04. This letter only addresses RR I3R-02.

## 2.0 REGULATORY REQUIREMENTS

For the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the ASME Code) Class 1, 2, and 3 components, ISI is performed in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME Code, and applicable addenda, as required by Section 50.55a(g) of Title 10 of the *Code of Federal Regulation* (10 CFR 50.55a(g)), except where specific relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i). The regulation 10 CFR 50.55a(a)(3) further states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

The licensee stated that (1) the ASME Code of record for Callaway's third 10-year ISI interval is the 1998 Edition through the 2000 Addenda of the ASME Code, Section XI, and (2) the third 10-year ISI interval began December 19, 2005, and is scheduled to end on December 18, 2015.

### 3.0 TECHNICAL EVALUATION OF RR I3R-02

#### 3.1 Applicable ASME Code Requirements

The applicable ASME Code requirements are the 1998 Edition through the 2000 Addenda of the ASME Code, Section XI, Table IWB-2500-1, Examination Category B-K, Footnote 4; Table IWC-2500-1, Examination Category C-C, Footnote 4; and Table IWD-2500-1, Examination Category D-A, Footnote 3, as follows:

- ASME Code, Section XI, Examination Category B-K, Footnote 4, and Examination Category C-C, Footnote 4. The footnotes state that for multiple vessels of similar design, function, and service, only one of the multiple vessels shall be selected for a surface examination.
- ASME Code, Section XI, Examination Category D-A, Footnote 3. The footnote states that selected samples of welded attachments shall be examined each inspection interval. All welded attachments selected for examination shall be those most subject to corrosion, as determined by the Owner, such as the welded attachments of the Service Water or Emergency Service Water systems. For multiple vessels of similar design, function, and service, the welded attachments of only one of the multiple vessels shall be selected for examination. For welded attachments of piping, pumps, and valves, a 10 percent sample shall be selected for examination. This percentage sample shall be proportional to the total number of nonexempt welded attachments connected to the piping, pumps, and valves in each system subject to these examinations.

Therefore, the licensee is requesting relief from the requirements in the following tables of Section XI, ASME Code, 1998 Edition through the 2000 Addenda:

- Table IWB-2500-1, Examination Category B-K, Footnote 4;
- Table IWC-2500-1, Examination Category C-C, Footnote 4; and
- Table IWD-2500-1, Examination Category D-A, Footnote 3.

#### 3.2 System/Component(s) for which Relief is Requested

The components for which relief is being requested by the licensee are all Section XI, ASME Code Class 1, 2, and 3 vessel welded attachments.

#### 3.3 Licensee's Proposed Alternative Examination

In lieu of implementing the requirements of Table IWB-2500-1, Examination Category B-K, Footnote 4; Table IWC-2500-1, Examination Category C-C, Footnote 4; and Table IWD-2500-1, Examination Category D-A, Footnote 3; the licensee has proposed that the alternative

requirements of ASME Code Case N-700 be implemented at Callaway for the third 10-year ISI interval.

### 3.4 Licensee's Basis for Requesting Relief

The licensee provided the following justification for RR I3R-02 in its application:

This 10 CFR 50.55a Request addresses two issues. First, ASME Section XI, 1998 Edition through 2000 Addenda, Table IWB-2500-1, Examination Category B-K, Footnote 4; Table IWC-2500-1, Examination Category C-C, Footnote 4; and Table IWD-2500-1, Examination Category D-A, Footnote 3 do not include specific criteria for the selection of welded attachments in situations where a plant has multiple vessels of similar design, function and service. The requirements in these footnotes do specify that "only one welded attachment of only one of the multiple vessels shall be selected for examination," but no additional criteria are provided for the selection of the appropriate welded attachment.

Second, the identified footnotes do not provide any specific criteria for the selection of welded attachments on single vessels. The current wording under the "Extent of Examination" in [ASME Code, Section XI,] Tables IWX-2500-1, Categories B-K, C-C[,], and D-A can be interpreted to require that all welded attachments on a single vessel be examined. This wording has been reconsidered by the ASME Code Committee, and Code Case N-700 (attached [to the licensee's application]) has been published to clarify the requirements for examining welded attachments on both multiple and single vessels.

One of the bases for Code Case N-700 was previously published Code Case N-509, "Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments," which was incorporated into ASME Section XI in the 1995 Addenda. The technical basis of Code Case N-509 concluded that there have been very few welded attachment failures identified during normal Section XI examinations. Instead, failures have been identified when the connected support member has been found to be deformed due to operational transients or water hammer events. For this reason, Code Case N-509 and Section XI versions that include the 1995 and later Addenda require welded attachments to be examined whenever component support deformation is identified. In addition, a sampling plan for welded attachments was maintained.

Although Code Case N-509 and ASME Section XI[,], beginning with the 1995 Addenda[,], represent an improvement to previously stated Code criteria for the examination of welded attachments, neither address the examination of welded attachments on a single vessel nor which welded attachment should be selected for examination. Code Case N-700 provides clarification for the selection of Class 1, 2, and 3 vessel welded attachments for examination, and was developed to address the selection criteria currently not included in Code Case N-509 and ASME Section XI, 1998 Edition through 2000 Addenda.

Code Case N-700 clarifies the requirements for the examination of welded attachment[s] on vessels by stating the following criteria:

- 1) For multiple vessels of similar design, function and service, only one welded attachment of only one of the multiple vessels shall be selected for examination.
- 2) For single vessels, only one welded attachment shall be selected for examination.
- 3) The attachment selected for examination on one of the multiple vessels or the single vessel, as applicable, shall be an attachment under continuous load during normal system operation, or an attachment subject to a potential intermittent load (seismic, water hammer, etc.) during normal system operation if an attachment under continuous load does not exist.

Because the selection criteria provided by Code Case N-700 are supported by the same failure data that forms the basis for Code Case N-509 and since they also address scenarios not specifically or adequately addressed by Section XI, the alternative requirements of [Code Case] N-700 are deemed to be a more complete and detailed set of rules for the selection of welded attachments on vessels. Accordingly, pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative provides an acceptable level of quality and safety.

#### 4.0 NRC STAFF EVALUATION

For ASME Code Class 1 and 2 welded attachments, the 1998 Edition through the 2000 Addenda of ASME Code, Section XI, Table IWB-2500-1, Examination Category B-K, Footnote 4, and Table IWC-2500-1, Examination Category C-C, Footnote 4, require that for multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. For ASME Code Class 3 welded attachments, Table IWD-2500-1, Examination Category D-A, Footnote 3, requires selected samples of welded attachments to be examined each inspection interval and requires that those selected for examination be those most subject to corrosion. For multiple vessels of similar design, function, and service, the welded attachments of only one of the multiple vessels shall be selected for examination.

As an alternative to the applicable ASME Code requirements, the licensee has proposed to apply ASME Code Case N-700 for the selection of ASME Code Class 1, 2, and 3 vessel welded attachments for examination. Code Case N-700 requires that for multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. In addition, Code Case N-700 requires that only one welded attachment on a single vessel is to be examined. The attachment selected for examination on one of the multiple vessels or the single vessel, as applicable, is to be an attachment under continuous load during operation if such an attachment exists.



Code Case N-700 utilizes the basis for development of Code Case N-509, which was incorporated in the ASME Code, Section XI, 1995 Edition, 1995 Addenda. The technical basis for development of Code Case N-509 concluded that operational transients and water hammer events were the main contributors to the potential for welded attachment failure and that the possibility for corrosion-related failure also existed.

Industry experience found that welded attachment failures have been identified as a result of connected support member deformation and have not been identified by the present ASME Code examinations. The ASME Code, Section XI, 1995 Edition, and later addenda, requires welded attachments to be examined whenever component support deformation is identified.

Code Case N-700 maintains the same sampling philosophy for welded attachments on vessels as does Code Case N-509 and most of the ASME Code examination requirements. The sampling philosophy ensures the detection of service-induced degradation. For multiple vessels the Code Case N-700 sampling plan requires only one welded attachment of only one of the multiple vessels to be selected for examination and for a single vessel only one welded attachment is to be examined. Code Case N-700 also requires that the attachment selected for examination is to be an attachment under continuous load during operation if such an attachment exists.

Based on the above evaluation, the NRC staff concludes that Code Case N-700 provides an acceptable level of quality and safety.

## 5.0 CONCLUSION

Based on the above evaluation, the NRC staff concludes that the licensee's proposed alternative in RR I3R-02 to use ASME Code Case N-700 for welded attachments on vessels provides an acceptable level of quality and safety. Therefore, the licensee's alternative is authorized pursuant to 10 CFR 55.55a(a)(3)(i) for the third 10-year ISI interval at Callaway, or until Code Case N-700 is approved for general use by reference in Regulatory Guide 1.147 "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," and incorporated by reference in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing the code case, it must follow all provisions of Code Case N-700 with conditions as specified in Regulatory Guide 1.147 and limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6), if any. All other requirements of the ASME Code, Sections III and XI, for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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Date: June 15, 2006

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