

June 3, 2003

Mr. Mark A. Peifer
Site Vice President
Duane Arnold Energy Center
Nuclear Management Company, LLC
3277 DAEC Road
Palo, IA 52324-0351

SUBJECT: DUANE ARNOLD ENERGY CENTER - THIRD 10-YEAR INTERVAL
INSERVICE INSPECTION PROGRAM RELIEF REQUEST NO. NDE-R045
(TAC NO. MB4803)

Dear Mr. Peifer:

By letter dated March 29, 2002, as supplemented April 11, 2003, Nuclear Management Company, LLC (licensee), submitted Relief Request No. NDE-R045, for the third 10-year interval of the inservice inspection (ISI) program at Duane Arnold Energy Center (facility). This relief request seeks relief in the form of limited examination coverage from the non-destructive examination (NDE) requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." Specifically, pursuant to 10 CFR 50.55a(a)(3)(i), Relief Request NDE-R045 proposes relief from performing volumetric examination of essentially 100 percent of the weld length for Scram Discharge Weld SDN-CF010, a pipe-to-cap configuration located off the Scram Discharge Piping. As a proposed alternative, the licensee would examine this pressure retaining piping weld to the maximum extent practical within the limitations of the examination technique or design of the component and would perform volumetric examination of 84.36 percent of the weld volume. The inaccessible portion of this weld would continue to be subject to the applicable system pressure test requirements of ASME Code, Section XI, Articles IWA-5000 and IWB-5000 with a visual (VT-2) examination.

The enclosed is the Nuclear Regulatory Commission (NRC) staff's Safety Evaluation for Relief Request No. NDE-R045. The NRC staff concludes that the proposed alternative will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternative for the third 10-year ISI interval. All other ASME Code, Section XI requirements relative to Scram Discharge Weld SDN-CF010 for which relief was not specifically requested or explicitly approved herein, including third party review by the Authorized Nuclear Inservice Inspector, remain applicable.

M. A. Peifer

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Your letter dated March 29, 2002, also included three other relief requests (NDE-R001, Revision 1; NDE-R028, Revision 2; and NDE-R044). The NRC staff has previously addressed Relief Requests NDE-R028, Revision 2, and NDE-R044 by letter dated March 26, 2003. Your letter of April 11, 2003, withdrew Relief Request No. NDE-R001, Revision 1. Therefore, this completes our review of your four relief requests.

If you have questions regarding the enclosure, please contact Darl Hood by phone at (301) 415-3049 or email (dsh@nrc.gov).

Sincerely,

/RA by John Stang for/

L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-331

Enclosure: Safety Evaluation

cc w/encl: See next page

M. A. Peifer

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO RELIEF REQUEST NO. NDE-R045
FOR THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM
NUCLEAR MANAGEMENT COMPANY, LLC
DUANE ARNOLD ENERGY CENTER
DOCKET NO. 50-331

1.0 INTRODUCTION

Inservice inspection (ISI) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) of 10 CFR states that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if the applicant demonstrates that (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, "Rules for Inservice Inspection of Nuclear Power Plant Components," 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 ISI code of record for Duane Arnold Energy Center (DAEC) for the third 10-year ISI interval is the 1989 Edition of the ASME Code.

By letter dated March 29, 2002, Nuclear Management Company, LLC (the licensee), requested relief for DAEC's third 10-year ISI interval under Relief Request Nos. NDE-R001, Revision 1; NDE-028, Revision 2; NDE-R044; and NDE-R045. The requested reliefs are from the volumetric examination coverage requirements for examination categories B-A, B-D, B-J, and C-F-2 welds. The NRC staff has previously addressed Relief Requests NDE-R028, Revision 2, and NDE-R044 by letter dated March 26, 2003. In a letter dated April 11, 2003, the licensee provided additional information to support Relief Request No. NDE-R045 and withdrew Relief

Request No. NDE-R001, Revision 1. Therefore, this safety evaluation addresses only Relief Request No. NDE-R045. Relief Request No. NDE-R045 proposes relief from performing volumetric examination of essentially 100 percent of the weld length for Scram Discharge Weld SDN-CF010, a pipe-to-cap configuration located off the ASME Code Class 2 Scram Discharge Piping.

2.0 ASME CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

The 1989 Edition of ASME Code, Section XI, Table IWC-2500-1, Code Examination Category C-F-2, Item C5.51, requires a surface and volumetric examination which includes essentially 100 percent of the weld length, once during the 10-year ISI interval.

3.0 LICENSEE'S PROPOSED ALTERNATIVE

For Scram Discharge Weld SDN-CF010, the licensee proposes to perform volumetric examination of 84.36 percent of the weld volume. The licensee states that it will examine this pressure retaining piping weld to the maximum extent practical within the limitations of the examination technique or design of the component.

4.0 LICENSEE'S BASIS FOR RELIEF

Regarding Scram Discharge Weld SDN-CF010, the licensee states:

This weld is a pipe to cap configuration located off the Scram Discharge Piping. The configuration limits the examination to approximately 84.36% of the code required coverage of the weld volume. In order to perform a radiography of the weld, draining the Scram Discharge piping would be required, which would result in an increase in exposure to personnel by a factor of 1.7 (5 mr/hr vs. 8.5 mr/hr) for a total of 232 mr for the additional 15.64% coverage. The benefit of examining the additional 15.64% weld volume has only a small potential of increasing plant safety margins and a very disproportionate impact on expenditures of plant manpower and radiation exposure.

ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1," permits a reduction in ASME Code Class 2 weld examination coverage, provided the coverage reduction is less than 10 percent. The licensee states that it has adopted Code Case N-460 in its ISI Program Plan for DAEC, as permitted by Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability--ASME Section XI, Division 1," Revision 12. Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee states that the proposed alternative provides an acceptable level of quality and safety. Should reportable indications be found in the accessible portions of the weld, the licensee would perform an engineering evaluation to determine if the inaccessible portion of the weld is affected. The licensee also states that the inaccessible portions of the weld will continue to be subject to the applicable system pressure test requirements of ASME Code, Section XI, Articles IWA-5000 and IWB-5000 with a visual (VT-2) examination.

5.0 NRC STAFF EVALUATION

The 1989 Edition of the ASME Code, Section XI, Table IWC-2500-1, Code Category C-F-2, Item C5.51, requires a volumetric examination and surface examination which includes

essentially 100 percent of the weld length, once during the 10-year ISI interval. The examination volume is defined in Figure IWC-2500-7 while Code Case N-460 provides alternative examination coverage for both Class 1 and 2 welds.

The NRC staff reviewed of the "Ultrasonic Examination Data Sheet (Manual Piping)" for Scram Discharge weld SDN-CF010 that the licensee provided in Attachment 2 to its letter of March 29, 2002. From this review, the NRC staff notes that there were no recordable indications identified with the amount of coverage obtained. In its supplemental letter dated April 11, 2003, the licensee indicated that the NDE results have been compared with previous results and that no indications were identified in either examination.

The licensee indicates that draining the Scram Discharge piping to obtain the remaining 15.64 percent coverage would increase radiation exposure by a factor of 1.7 and would be disproportionate to the amount of manpower expenditure and dose accumulation. The NRC staff does not concur that draining a portion of the Scram Discharge piping system to obtain ASME Code coverage by radiography would be disproportionate with regard to dose accumulation for this application. However, the NRC staff finds that examining this additional 15.64 percent has only a small potential to increase plant safety margins, considering (1) that 84.36 percent of the weld is volumetrically examined and 94.47 percent is surface examined, (2) the absence of discernable patterns in the accessible portion of the weld during current and previous tests, and (3) that other tests (e.g., pressure tests) are also performed on this weld.

The NRC staff concludes from the information provided by the licensee that reasonable assurance exists that the 84.36 percent coverage obtained would have identified any pattern of degradation. Also, the surface and pressure testing, which includes a visual (VT-2) examination, should identify any pattern of degradation should one develop. Therefore, the NRC staff concludes that the proposed alternative provides an acceptable level of quality and safety.

6.0 CONCLUSION

On the basis of the above evaluation, the NRC staff concludes that the licensee's proposed alternative in Relief Request No. NDE-R045 provides an acceptable level of quality and safety for DAEC's third 10-year ISI interval. Therefore, pursuant to 10 CFR50.55a(a)(3)(i), the NRC staff authorizes the proposed alternative for the third 10-year ISI interval. All other ASME Code, Section XI requirements for which relief was not specifically requested in this relief request, and not approved by the NRC, remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: T. Steingass

Date: June 3, 2003