March 7, 2001

Gary Van Middlesworth
Site General Manager
Duane Arnold Energy Center
Nuclear Management Company, LLC
3277 DAEC Road
Palo, Iowa 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER, RELIEF REQUEST NO. NDE-R028 REVISION 1 FOR THE THIRD 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NO. MA8523)

Dear Mr. Van Middlesworth:

In a letter dated February 7, 2000, IES Utilities, Inc., the licensee,[1] submitted a revised relief request regarding the extent of coverage required for volumetric non-destructive examinations (NDE) of nozzle-to-vessel welds for the third 10-year interval Inservice Inspection (ISI) Program for the Duane Arnold Energy Center (DAEC). The request, designated NDE-R028, Revision 1, seeks relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the ASME Code), Section XI (1989 Edition), Table IWB-2500-1 Category B-D, Item B3.90 which requires a volumetric examination of essentially 100 percent of the weld length. Relief is requested for certain specified welds, examined during refueling outage 16 and identified in a "List of Nozzle-to-Vessel Welds," for which examination of the full length is impractical because of configuration and obstructions. NMC provided supplemental information in support of NDE-R028 by letter dated January 19, 2001.

The Nuclear Regulatory Commission (NRC) staff has reviewed NDE-R028, Revision 1. The enclosure is our safety evaluation which concludes that the identified examinations are impractical and cannot be performed at DAEC to the extent required by the ASME Code. NMC's examinations provide reasonable assurance of structural integrity of these welds. The NRC staff also concludes that the relief requested in Revision 1 of NDE-R028 is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the Commission grants NDE-R028, Revision 1, as requested, pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year ISI interval at DAEC for the coverages and welds listed in the table "List of Nozzle-to-Vessel Welds."

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[1] IES Utilities, Inc., was subsequently succeeded by Nuclear Management Company, LLC (NMC), as the licensed operator of DAEC. By letter dated October 5, 2000, NMC requested that the NRC staff continue to process and disposition licensing actions previously docketed and requested by IES Utilities, Inc.

If you have any questions regarding this letter or safety evaluation, please contact your Project Manager, Darl S. Hood, at 301-415-3049.

Sincerely,

/RA/

Claudia M. Craig, 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

If you have any questions regarding this letter or safety evaluation, please contact your Project Manager, Darl S. Hood, at 301-415-3049.

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/RA/

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Duane Arnold Energy Center

cc:

Al Gutterman
Morgan, Lewis, & Bockius LLP
1800 M Street, N. W.
Washington, DC 20036-5869

Chairman, Linn County
Board of Supervisors
Cedar Rapids, IA 52406

Plant Manager, Nuclear
Duane Arnold Energy Center
Nuclear Management Company, LLC
3277 DAEC Road
Palo, IA 52324

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
Rural Route #1
Palo, IA 52324

Regional Administrator
U.S. NRC, Region III
801 Warrenville Road
Lisle, IL 60532-4531

Daniel McGhee
Utilities Division
Iowa Department of Commerce
Lucas Office Building, 5th floor
Des Moines, IA 50319

Michael D. Wadley
Chief Nuclear Officer
Nuclear Management Company, LLC
700 First Street
Hudson, WI 54016

Nuclear Asset Manager
Alliant Energy/IES Utilities, Inc.
3277 DAEC Road
Palo, IA 52324

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST NDE-R028, REVISION 1, FROM THE AMERICAN

SOCIETY OF MECHANICAL ENGINEERS CODE, SECTION XI REQUIREMENTS

NUCLEAR MANAGEMENT COMPANY, LLC

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By letter dated February 7, 2000, IES Utilities, Inc., (the licensee)[1] submitted a request for relief from certain examination requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The request, designated NDE-R028, Revision 1, regards the extent of coverage required for volumetric non-destructive examinations (NDE) of nozzle-to-vessel welds for the third 10-year interval Inservice Inspection (ISI) Program for the Duane Arnold Energy Center (DAEC). Nuclear Management Company, LLC (NMC and licensee) provided supplemental information in support of NDE-R028 by letter dated January 19, 2001. The Nuclear Regulatory Commission (NRC) staff has evaluated the request and the information provided in support of the request for relief from ASME Code requirements pursuant to the provisions of 10 CFR 50.55a(g)(6)(i). The basis for the NRC staff's disposition and conclusion for NDE-R028, Revision 1, are documented below.

The letter dated February 7, 2000, also included a relief request, designated MC-R008, regarding Drywell Stabilizer X-58A. That relief request was previously addressed by the NRC staff in separate correspondence dated December 13, 2000, and therefore, is not included in the safety evaluation below.

2.0 BACKGROUND

Inservice inspection of the ASME Code Class 1, 2 and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(g)(6)(i) provides that the Commission may evaluate

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[1] IES Utilities, Inc., who was the licensee at the time of the submittal, was subsequently succeeded by Nuclear Management Company, LLC (NMC), as the licensed operator of DAEC. By letter dated October 5, 2000, NMC requested that the NRC staff continue to process and disposition licensing actions previously docketed and requested by IES Utilities, Inc.

determinations under paragraph (g)(5) that code requirements are impractical and may grant relief (or impose alternative requirements) as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the third 10-year ISI interval at DAEC is the 1989 Edition.

The NRC staff initially approved NDE-R028 by letter dated October 18, 1999. In Revision 1, the licensee has modified NDE-R028 to incorporate additional nozzle-to-vessel welds that were examined during Refueling Outage No. 16 for which the 100 percent coverage required by the ASME Code could not be obtained.

3.0 LICENSEE'S RELIEF REQUEST NO. NDE-R028, REVISION 1

3.1 Components for which Relief is Requested:

ASME Code Class:	1
References:	IWB-2500 Table IWB-2500-1
Examination Category:	B-D
Item Number:	B3.90
Description:	Nozzle-to-Vessel Welds listed below:

List of Nozzle-to-Vessel Welds

Nozzle Identification[2]	Period Examined	Coverage Achieved	System
CRA-D001	1	61.3%	Control Rod Drive
CSA-D001	1	63%	Core Spray
CSB-D001	1	66%	Core Spray
FWA-D001	1	56.5%	Feedwater
HVA-D001	1	66%	Head Vent
JPA-D001	1	61.1%	Jet Pump
MSA-D001	1	59.6%	Main Steam
MSB-D001	2	63%	Main Steam
RHA-D001	1	65.7%	Head Spray
RCA-D001	2	59%	Recirculation Suction
RCB-D001	1	57%	Recirculation Suction
RRA-D001	1	63%	Recirculation Inlet
RRB-D001	1	63%	Recirculation Inlet
RRC-D001	1	63%	Recirculation Inlet
RRD-D001	1	51.4%	Recirculation Inlet
RRE-D001	1	64%	Recirculation Inlet
RRH-D001	1	64%	Recirculation Inlet
VID-D001	2	63%	Vessel Instrumentation
VIE-D001	1	66%	Vessel Instrumentation

[2] Table entries with shaded backgrounds were previously approved by NRC letter dated October 18, 1999, and are repeated here for completeness only. Sketches of the nozzle-to-vessel welds added by Revision 1 of NDE-R028 are shown in the attachment to NMC's letter dated January 19, 2001.

3.2 ASME Code Requirement:

The licensee states that:

> Section XI (1989 Edition), Table IWB-2500-1, Category B-D, Item B3.90, requires a volumetric examination, which includes essentially 100 percent of the weld, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-7(b).
>
> Code Case N-460 permits a reduction in examination coverage of Class 1 welds provided the coverage reduction is less than 10 percent. The DAEC has adopted Code Case N-460 in the ISI Program Plan, as permitted by USNRC Regulatory Guide 1.147, Revision 12.
>
> Relief is requested from performing essentially 100 percent of the weld length for those welds identified in the "List of Nozzle-to-Vessel Welds."

3.3 Licensee's Basis for Relief:

The licensee provides the following explanation as to why the ASME Code requirements cannot be met:

> Due to the design of these welds, it is not feasible to effectively perform a volumetric examination of 100 percent of the volume as described in IWB-2500-7(b). The nozzle-to-vessel welds are accessible from the vessel side, but examination cannot be performed from the nozzle side because of the forging curvature. In addition to component configuration, weld RCB-D001 was also limited due to insulation support bracket interference. Certain nozzle-to-vessel weld examinations are further limited by reactor pressure vessel (RPV) design obstructions. In accordance with 10 CFR 50.55a(g)(6)(i), relief requests may be granted when the examination requirements are shown to be impractical.

3.4 Licensee's Proposed Alternative:

The licensee proposes the following alternative:

> The DAEC proposes to perform volumetric examination from the vessel side of the nozzle-to-vessel welds identified in the "List of Nozzle-to-Vessel Welds." Because of the design of these welds, there are no alternative examination techniques currently available to increase the examination volume.

4.0 NRC STAFF EVALUATION

The ASME Code requires that all RPV nozzle-to-vessel welds receive a volumetric examination each inspection interval, as defined by applicable Figures IWB-2500-7(a) through (d). However, the nozzles' configuration/geometries restrict scanning, which limits the extent of the volumetric examination that can be attained.

The limitations discussed in the licensee's subm ittals support the determination that volumetric examination of the specified nozzle-to-vessel welds, to the extent required by the ASME Code, is impractical. To increase the examination coverage, the RPV and/or nozzles would require extensive modifications. Imposition of this requirement on the licensee would cause a considerable burden.

The licensee obtained a significant level of volumetric coverage on each of the specified nozzle welds for which relief is requested. In addition, volumetric examinations of other similar RPV nozzle-to-vessel welds were performed. The NRC staff finds with reasonable assurance that any degradation pattern, if present, would have been detected by the limited examinations. The licensee's examinations provide reasonable assurance of structural integrity for the specified welds. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the licensee's third 10-year ISI interval at DAEC.

5.0 CONCLUSION

The NRC staff concludes that the inservice examinations for the welds specified in Revision 1 to NDE-R028 are impractical and cannot be performed at DAEC to the extent required by the ASME Code. The licensee's examinations provide reasonable assurance of structural integrity of the specified welds. The NRC staff also concludes that the relief requested in Revision 1 to NDE-R028 is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the relief requested by Relief Request No. NDE-028, Revision 1, is granted for the third 10-year ISI interval at DAEC pursuant to 10 CFR 50.55a(g)(6)(i) for the coverages listed in the table entitled "List of Nozzle-to-Vessel Welds".

Principal Contributor: A. Keim

Dated: March 7, 2001