

July 3, 2006

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Mr. Gary Van Middlesworth
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SUBJECT: DUANE ARNOLD ENERGY CENTER, MONTICELLO NUCLEAR GENERATING PLANT, PALISADES NUCLEAR PLANT, POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2, PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 — USE OF ASME CODE CASE N-513-2 (TAC NOS. MC9478 THROUGH MC9484)

Dear Sirs:

Nuclear Management Company, LLC's (NMC's) letter of December 12, 2005, requested we approve a relief request to use the alternative requirements of Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," in lieu of Subarticle IWA-4000 of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code*, Section XI. This relief request applied to the following nuclear units:

- Duane Arnold Energy Center
- Monticello Nuclear Generating Plant
- Palisades Nuclear Plant
- Point Beach Nuclear Plant, Units 1 and 2
- Prairie Island Nuclear Generating Plant, Units 1 and 2

On January 27, 2006, the NRC issued Amendment No. 260 transferring the license for Duane Arnold Energy Center to FPL Energy Duane Arnold, LLC. Accordingly, we are addressing our authorization to both NMC and FPL Energy Duane Arnold, LLC.

Based on our review of the submitted information, we conclude that the proposed alternatives in ASME, Section XI, Code Case N-513-2, as discussed in the request for relief, will provide an acceptable level of quality and safety. Code Case N-513-2 contains requirements to maintain piping structural integrity, and incorporates the conditions listed in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability," Revision 14.

Pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized to perform piping evaluations to determine whether temporary continued operation of applicable ASME Class 2 and 3 piping system is allowed. This authorization applies to Duane Arnold, Monticello, Prairie Island, Units 1 and 2, Point Beach, Units 1 and 2, and Palisades, for the remainder of the 10-year inservice inspection interval of the respective units as noted in the relief request.

Use of the Code Case is authorized until such time as the Code case is published in a future version of RG 1.147, and incorporated by reference in 10 CFR 50.55a(b). At that time, if NMC or FPL Energy Duane Arnold, LLC intends to continue implementing this Code case, it must follow all provisions of Code Case N-513-2 with conditions as specified in RG 1.147, and limitations as specified in Sections 50.55a(b)(4), (b)(5), and (b)(6), if any. If you have any questions, please contact L. Mark Padovan at 301-415-1423.

Sincerely,

/RA/

L. Raghavan, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-331, 50-263, 50-255,
50-266, 50-301, 50-282 and 50-306

Enclosure:
Safety Evaluation

ccs w/encl: See next page

Pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized to perform piping evaluations to determine whether temporary continued operation of applicable ASME Class 2 and 3 piping system is allowed. This authorization applies to Duane Arnold, Monticello, Prairie Island, Units 1 and 2, Point Beach, Units 1 and 2, and Palisades, for the remainder of the 10-year inservice inspection interval of the respective units as noted in the relief request.

Use of the Code Case is authorized until such time as the Code case is published in a future version of RG 1.147, and incorporated by reference in 10 CFR 50.55a(b). At that time, if NMC FPL Energy Duane Arnold, LLC intends to continue implementing this Code case, it must follow all provisions of Code Case N-513-2 with conditions as specified in RG 1.147, and limitations as specified in Section 50.55a(b)(4), (b)(5), and (b)(6), if any. If you have any questions, please contact L. Mark Padovan at 301-415-1423.

Sincerely,

/RA/

L. Raghavan, Chief
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ccs w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

USE OF ASME CODE CASE N-513-2

NUCLEAR MANAGEMENT COMPANY, LLC

FPL ENERGY DUANE ARNOLD, LLC

DUANE ARNOLD ENERGY CENTER

MONTICELLO NUCLEAR GENERATING PLANT

PALISADES NUCLEAR PLANT

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-331, 50-263, 50-255, 50-266, 50-301, 50-282 and 50-306

1.0 INTRODUCTION

Nuclear Management Company, LLC's (NMC's) letter of December 12, 2005, requested Nuclear Regulatory Commission (NRC) approval of a relief request to use the alternative requirements of American Society of Mechanical Engineers (ASME) Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," in lieu of Subarticle IWA-4000 of the ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." This relief request applied to the following nuclear units:

- Duane Arnold Energy Center
- Monticello Nuclear Generating Plant
- Palisades Nuclear Plant
- Point Beach Nuclear Plant, Units 1 and 2
- Prairie Island Nuclear Generating Plant, Units 1 and 2

On January 27, 2006, the NRC issued Amendment No. 260 transferring of the license for Duane Arnold Energy Center to FPL Energy Duane Arnold, LLC. Accordingly, this authorization applies to both NMC and FPL Energy Duane Arnold, LLC.

ENCLOSURE

2.0 REGULATORY EVALUATION

The inservice inspection (ISI) of the ASME Code Class 1, Class 2, and Class 3 components is to be performed in accordance with the ASME Code, Section XI, and applicable edition and addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the

Commission pursuant to 10 CFR 50.55a(g)(6)(i). Paragraph 50.55a(g)(6)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR), states that "The Commission will evaluate determinations . . . that [ASME] code requirements are impractical. The Commission may grant such relief and may impose such 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 paragraph 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the 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 paragraph 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) will 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. Paragraph 10 CFR 50.55a(g)(4) requires that inservice examination of components and system pressure tests conducted during the first 10-year inspection interval and subsequent inspection intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code. The latest edition and addenda of Section XI of the ASME Code is incorporated by reference in paragraph 10 CFR 50.55a(b), 12 months prior to the start of the 10-year inspection interval.

3.0 NMC'S RELIEF REQUEST

3.1 ASME Code Component(s) Affected

ASME Section XI, Moderate Energy Class 2 and Class 3 Piping.

3.2 Applicable ASME, Section XI, Code Edition and Addenda

Plants	Inservice Inspection	Repair/Replacement
Monticello	1995 Edition with the 1996 Addenda	2001 Edition
Prairie Island	1998 Edition with the 2000 Addenda	1998 Edition with the 2000 Addenda
Point Beach	1998 Edition with the 2000 Addenda	1998 Edition with the 2000 Addenda
Palisades	1989 Edition	1989 Edition

Duane Arnold	1989 Edition	1992 Edition with the 1992 Addenda
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3.3 Applicable ASME Code Requirements

NMC presented the following requirements of the 1989 Edition of the ASME Code, Section XI, for Class 3 and Class 2 piping:

CLASS 3

IWD-3000 states, "This article is in course of preparation. The rules of IWB-3000 may be used."

IWB-3132 provides four ways in which an inservice volumetric or surface examination may be accepted.

1. IWB-3132.1, "Acceptance by Volumetric or Surface Examination"
2. IWB-3132.2, "Acceptance by Repair"
3. IWB-3132.3, "Acceptance by Replacement"
4. IWB-3132.4, "Acceptance by Analytical Evaluation"

IWB-3132.2 states, "Components whose volumetric or surface examination reveals flaws that exceed the acceptance standards listed in Table IWB-3410-1 shall be unacceptable for continued service until the additional examination requirements of IWB-2430 are satisfied, and the flaw shall be either removed by mechanical methods or the component repaired to the extent necessary to meet the acceptance standards of IWB-3000."

IWB-3132.3 states, "As an alternative to the repair requirement of IWB-3132.2, the component or the portion of the component containing the flaw shall be replaced."

IWB-3142 provides five ways in which an inservice visual examination may be accepted.

1. IWB-3142.1, "Acceptance by Visual Examination"
2. IWB-3142.2, "Acceptance by Supplemental Examination"
3. IWB-3142.3, "Acceptance by Corrective Measures or Repairs"
4. IWB-3142.4, "Acceptance by Analytical Evaluation"
5. IWB-3142.5, "Acceptance by Replacement"

IWB-3142.3 states, "Components containing relevant conditions shall be acceptable for continued service if the relevant conditions are corrected or the components are repaired to the extent necessary to meet the acceptance standards specified in Table IWB-3410-1."

IWB-3142.5 states, "As an alternative to either the supplemental examinations of IWB-3142.2, the corrective measures or repairs of IWB-3142.3, or the evaluation of IWB-3142.4, the component or that part of the component containing the relevant condition shall be replaced."

CLASS 2

IWC-3122 provides four ways in which an inservice volumetric and surface examination may be accepted.

1. IWC-3122.1, "Acceptance by Examination"
2. IWC-3122.2, "Acceptance by Repair"
3. IWC-3122.3, "Acceptance by Replacement"
4. IWC-3122.4, "Acceptance by Evaluation"

IWC-3122.2 states, "Components whose examination reveals flaws that exceed the acceptance standards listed in Table IWC-3410-1 shall be unacceptable for continued service until the additional examination requirements of IWC-2430 are satisfied, and the flaw shall be either removed by mechanical methods or the component repaired to the extent necessary to meet the acceptance standards of IWC-3000."

IWC-3122.3 states, "As an alternative to the repair requirements of IWC-3122.2, a component or the portion of the component containing the flaw shall be replaced."

IWC-3132 provides four ways in which an inservice visual examination may be accepted.

1. IWC-3132.1, "Acceptance by Supplemental Examination"
2. IWC-3132.2, "Acceptance by Corrective Measures or Repairs"
3. IWC-3132.3, "Acceptance by Evaluation"
4. IWC-3132.4, "Acceptance by Replacement"

IWC-3132.2 states, "Components containing relevant conditions shall be acceptable for continued service if the relevant conditions are corrected or the components are repaired to the extent necessary to meet the acceptance standards specified in Table IWC-3410-1."

IWC-3132.4 states, "As an alternative to the supplemental examinations of IWC-3132.1, the corrective measures or repairs of IWC-3132.2, or the evaluation of IWC-3132.3, a component or part of a component containing the relevant condition shall be replaced."

The requirements of the 1995 Edition with the 1996 Addenda are similar to the requirements of the 1998 Edition with the 2000 Addenda. NMC presented the requirements for Class 3 and Class 2 piping as follows:

CLASS 3

IWD-3000 states, "This Article is in course of preparation. The rules of IWB-3000 may be used."

IWB-3132 provides three ways in which an inservice volumetric or surface examination may be accepted.

1. IWB-3132.1, "Acceptance by Volumetric or Surface Examination,"
2. IWB-3132.2, "Acceptance by Repair/Replacement Activity," or
3. IWB-3132.3, "Acceptance by Analytical Evaluation."

IWB-3132.2 states, "A component whose volumetric or surface examination detects flaws that exceed the acceptance standards of Table IWB-3410-1 is unacceptable for continued service until the additional examination requirements of IWB-2430 are satisfied and the component is corrected by a repair/replacement activity to the extent necessary to meet the acceptance standards of IWB-3000."

IWB-3142 provides four ways in which an inservice visual examination may be accepted.

1. IWB-3142.1, "Acceptance by Visual Examination"
2. IWB-3142.2, "Acceptance by Supplemental Examination"
3. IWB-3142.3, "Acceptance by Corrective Measures or Repair/Replacement Activity"
4. IWB-3142.4, "Acceptance by Analytical Evaluation"

IWB-3142.3 states, "A component containing relevant conditions is acceptable for continued service if the relevant conditions are corrected by a repair/replacement activity or by corrective measure to the extent necessary to meet the acceptance standards of Table IWB-3410-1."

Class 2 Piping

IWC-3122 provides three ways in which an inservice volumetric and surface examinations may be accepted.

1. IWC-3122.1, "Acceptance by Examination"
2. IWC-3122.2, "Acceptance by Repair/Replacement Activity"
3. IWC-3122.3, "Acceptance by Analytical Evaluation"

IWC-3122.2 states, "A component whose examination detects flaws that exceed the acceptance standards of Table IWC-3410-1 is unacceptable for continued service until the additional examination requirements of IWC-2430 are satisfied and the component is corrected by a repair/replacement activity to the extent necessary to meet the acceptance standards of IWC-3000."

IWC-3132 provides four ways in which an inservice visual examinations may be accepted.

1. IWC-3132, "Acceptance"
2. IWC-3132.1, "Acceptance by Supplemental Examination"
3. IWC-3132.2, "Acceptance by Corrective Measures or Repair/Replacement Activity"
4. IWC-3132.3, "Acceptance by Analytical Evaluation"

IWC-3132.2 states, "A component containing relevant conditions is acceptable for continued service if the relevant conditions are corrected by a repair/replacement activity

or by corrective measures to the extent necessary to meet the acceptance standards of Table IWC-3410-1.”

3.4 NMC's Basis For The Relief Request

NMC stated that relief is requested from replacement or internal weld repair of wall thinning conditions resulting from various wall thinning degradation mechanisms such as erosion, corrosion, cavitation, and pitting in moderate energy Class 2 and 3 piping systems in accordance with the design specification and the original construction code.

NMC stated that the NRC in RG 1.147, Revision 14, has accepted Code Case N-513-1 with the following limitations:

1. Specific safety factors in paragraph 4.0 must be satisfied.
2. Code Case N-513 may not be applied to:
 - i. components other than pipe and tube
 - ii. leakage through a gasket
 - iii. threaded connections employing nonstructural seal welds for leakage prevention (through seal weld leakage is not a structural flaw; thread integrity must be maintained)
 - iv. degraded socket welds

Code Case N-513-1 permits flaws in Class 2 and 3 moderate-energy piping on a temporary basis until the next outage if it can be demonstrated that adequate pipe integrity and leakage containment are maintained. The Code Case currently applies to part-through and through-wall planar flaws and part-through nonplanar flaws. Service experience has shown that some piping can suffer degradation from nonplanar flaws, such as pitting and microbiological attack, where leakage can occur. The Code Case can be used for nonplanar through-wall flaws, but in a restrictive situation where nonplanar geometry is dominant in one plane.

According to NMC, some plants have used the intent of Code Case N-513 for nonplanar leaking flaws. However, relief requests from code requirements are still required because of the limited scope of Code Case N-513. Code Case N-513-2 has expanded the application to cover all types of nonplanar flaws. The analysis procedures were expanded to address the general case of through-wall degradation. Code Case N-513-2 incorporates improved flaw evaluation procedures for piping that are provided in Appendix C to the 2002 Addenda of the ASME Code, Section XI. Code Case N-513-2 addresses the limitations posed in RG 1.147 as follows:

1. Paragraph 4.0 was revised to incorporate references to Appendix C for acceptance and eliminated the provision that lower safety factors may be used.
2. 1.0(a) was revised to limit the application of the code case as specified in the limitation applied in RG 1.147.

3.5 Duration of Proposed Alternative

NMC requested approval of Code Case N-513-2 to be used for the 10-year ISI intervals for the plants as shown in the table below, or until the NRC publishes Code Case N-513-2 in a future

revision of RG 1.147.

Plant	ISI Interval	Interval Dates
Monticello	Fourth	May 1, 2003 to May 31, 2012
Prairie Island 1 & 2	Fourth	December 21, 2004 to December 20, 2014
Point Beach 1 & 2	Fourth	July 1, 2002 to June 30, 2012
Palisades	Third	May 12, 1995 to May 12, 2006
Duane Arnold	Third	November 1, 1996 to October 31, 2006

4.0 TECHNICAL EVALUATION

As indicated in the above ASME Code, Section XI, requirements, flaws detected in Class 2 and 3 piping need to be either removed by repair/replacement, or accepted by analysis or acceptance criteria of the ASME Code. In the mid-1990's, the industry proposed temporary measures to accept and manage flaws in service for Class 3 piping. On August 14, 1997, the ASME issued the original Code Case N-513 to permit temporary acceptance of flaws in moderate energy Class 3 piping for operation without repair/replacement of degraded pipe.

On March 28, 2001, the ASME issued Code Case N-513-1 which permits Class 2 and Class 3 piping to accept the flaws in service temporarily without repair/replacement. Code Case N-513-1 also includes a revised flaw evaluation methodology. As stated in NMC's basis above, the staff has accepted Code Case N-513-1 in RG 1.47, Revision 14, with conditions. The staff's conditions are related to safety factors and the scope of applicability of the code case.

On February 20, 2004, the ASME issued Code Case N-513-2. However, the staff has not approved Code Case N-513-2 in RG 1.147, Revision 14, nor in 10 CFR 50.55a.

The staff has reviewed changes between Code Case N-513-1 and Code Case N-513-2. The staff confirms that Code Case N-513-2 has incorporated the conditions imposed in RG 1.147, Revision 14. As discussed above, Code Case N-513-2 has incorporated the flaw evaluation procedures for piping that are specified in Appendix C to the 2002 Addenda of the ASME Code, Section XI. The staff has approved the 2002 Addenda of the ASME Code in 10 CFR 50.55a. Therefore, the use of the flaw evaluation methodology in Appendix C to the 2002 Addenda is acceptable.

The staff notes that although the degraded pipe is permitted to operate per Code Case N-513-2, the degraded piping is required to be repaired or replaced during the subsequent refueling outage in accordance with appropriated Section III and/or Section XI of the ASME Code.

Although flaws are allowed to remain in service, Code Case N-513-2 provides requirements to assure piping integrity. Code Case N-513-2 requires frequent inspections of no longer than

30-day intervals to determine if the flaw is growing and to establish the time at which the flaw will reach the allowable size. For through-wall leaking flaws, the code case requires daily walkdowns to confirm that the analysis conditions used in the evaluation remain valid. In addition, the Code Case requires augmented volumetric examination or physical measurement to assess degradation of affected system. The Code Case requires expansion in the inspection scope by increasing the sample size. If the inspections show that the flaw growth rate to be unacceptable, the Code Case requires immediate repair or replacement. Code Case N-513-2 also provides a rigorous methodology and acceptance criteria to evaluate the flaw. NMC and FPL Energy Duane Arnold, LLC are committed to adhere to all of the requirements in Code Case N-513-2.

On the basis of the above evaluation, the staff finds that in lieu of ASME Code, Section XI, IWA-4000, the proposed alternative requirements of Code Case N-513-2 provide an acceptable level of quality and safety.

5.0 CONCLUSION

On the basis of the staff's review of the submitted information, the staff concludes that the proposed alternatives in ASME Code, Section XI, Code Case N-513-2, as discussed in the request for relief will provide an acceptable level of quality and safety. Code Case N-513-2 contains requirements to maintain piping structural integrity, and incorporates the conditions listed in RG 1.147, Revision 14. Use of the Code Case is authorized until such time as the Code case is published in a future version of RG 1.147, and incorporated by reference in 10 CFR 50.55a(b). At that time, if NMC or FPL Energy Duane Arnold, LLC intends to continue implementing this Code case, it must follow all provisions of Code Case N-513-2 with conditions as specified in RG 1.147, and limitations as specified in Sections 50.55a(b)(4), (b)(5), and (b)(6), if any.

Pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the performance of piping evaluations to determine whether temporary continued operation of applicable ASME Code Class 2 and 3 piping system is allowed. This authorization applies to Duane Arnold, Monticello, Prairie Island, Units 1 and 2, Point Beach, Units 1 and 2, and Palisades for the remainder of the 10-year ISI interval of the respective units as noted in the relief request. All other requirements of the ASME Code, Sections III and XI, for which relief has not been specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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