March 1, 2007

Mr. Mano K. Nazar
Senior Vice President and
Chief Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 2 (DCCNP-2) - ALTERNATIVE REGARDING USE OF PREEMPTIVE WELD OVERLAYS ON CERTAIN DISSIMILAR METAL WELDS (TAC NO. MC9305)

Dear Mr. Nazar:

By letter dated December 21, 2005, as supplemented by letters dated March 1, April 11, June 23, and December 7, 2006, Indiana Michigan Power Company proposed Relief Request ISIR-20 involving modifying repair requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Case N-504-2, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1", and Code Case N-638-1, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW [Gas Tungsten-Arc Welding] Temper Bead Technique, Section XI, Division 1."

Relief Request ISIR-20 would be used at DCCNP-2 to apply a preemptive weld overlay on the pressurizer nozzle safe-end-to-nozzle dissimilar metal welds to mitigate the occurrence of primary water stress corrosion cracking (PWSCC) prior to detectable evidence of PWSCC.

On March 23, 2006, the Nuclear Regulatory Commission (NRC) staff gave DCCNP-2 temporary verbal approval of the proposed alternative. The NRC staff has now completed review (see enclosed safety evaluation) of DCCNP-2's submittals and concludes that Relief Request ISIR-20, including modifications to Code Cases N-504-2 and N-638-1, for full structural PWOLs of the welds specified will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the alternative for the remaining service life, including the period of extended operating for the components specified in the licensee's submittals. All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions regarding this approval, or need clarification of the enclosed safety evaluation, please contact the project manager, Mr. Peter Tam at 301-415-1451.

Sincerely,

/RA/

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

Docket No. 50-316

Enclosure:
Safety Evaluation

cc w/encl: See next page

If you have any questions regarding this approval, or need clarification of the enclosed safety evaluation, please contact the project manager, Mr. Peter Tam at 301-415-1451.

Sincerely,

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE INSPECTION PROGRAM RELIEF REQUEST ISIR-20

INDIANA MICHIGAN POWER COMPANY, LLC

DONALD C. COOK NUCLEAR PLANT, UNIT 2 (DCCNP-2)

DOCKET NO. 50-316

1.0 INTRODUCTION

By letter dated December 21, 2005 (Accession No. ML053570112), as supplemented by letters dated March 1 (Accession No. 060620063), April 11 (Accession No. ML061090834), June 23, (Accession No. ML061780575), and December 7, 2006 (Accession No. ML063530337), Indiana Michigan Power Company (the licensee) submitted Relief Request ISIR-20 for DCCNP-2. The licensee proposed to modify the repair requirements of American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Case N-504-2, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1" (N-504-2), and Code Case N-638-1, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW Temper Bead Technique, Section XI, Division 1" (N-638-1). Relief Request ISIR-20 would be used to perform full structural preemptive weld overlays (PWOLs) on pressurizer spray, safety, relief, and surge nozzle safe-end-to-nozzle dissimilar metal welds and weld overlays for the elbow-to-safe-end welds. The subject welds were fabricated using NiCrFe Alloy 82/182 weld material to butter the nozzle weld geometry ends and to weld the safe ends. The licensee stated that this weld material has demonstrated a propensity for primary water stress corrosion cracking (PWSCC) in the licensee's nuclear fleet. The licensee intends to mitigate the effects of cracking on specific DCCNP-2 welds by applying full structural PWOLs prior to the onset of PWSCC.

On March 23, 2006, the Nuclear Regulatory Commission (NRC) staff gave the licensee temporary verbal approval of the proposed alternative (see phone record at Accession No. ML060820421) per the provisions of Office Instruction LIC-102, "Relief Request Reviews," Rev. 1. The NRC staff's review of the licensee's submittals is set forth below.

2.0 REGULATORY EVALUATION

Pursuant to Title 10 of the *Code of Federal Regulations* (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, "Rules for Inservice Inspection (ISI) 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 DCCNP-2 for the third 10-year ISI interval is the 1989 Edition of the Code with no addenda.

In accordance with 10 CFR 50.55a(g)(6)(ii)(C)(1), the implementation of Supplements 1 through 8, 10, and 11 of Appendix VIII to Section XI, 1995 edition with the 1996 addenda of the ASME Code, was required on a phased schedule ending on November 22, 2002. Supplement 11 was required to be implemented by November 22, 2001. Additionally, 10 CFR 50.55a(g)(6)(ii)(C)(2) requires licensees implementing the 1989 edition and earlier editions of paragraph IWA-2232 of Section XI of the ASME Code to implement the 1995 edition with the 1996 addenda of Appendix VIII and supplements to Appendix VIII of Section XI of the ASME Code.

Pursuant to 10 CFR 50.55a(g)(4)(iv), ISI Items may meet the requirements set forth in subsequent editions and addenda of the ASME Code that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed therein, and subject to NRC approval. Portions of editions and addenda may be used provided that related requirements of the respective editions and addenda are met.

Pursuant to 10 CFR 50.55a(a)(3) alternatives to requirements may be authorized by the NRC if the licensee demonstrates that: (i) the proposed alternatives 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. The licensee's Relief Request ISIR-20, submitted under 10 CFR 50.55a(a)(3)(i), proposed modifications to the implementation of the ASME Code, Section XI, Appendix VIII, Supplement 11, Code Cases N-638-1 and N-504-2, for the deposition of PWOLs for the remaining service life of the components including the period of extended operation.

3.0 TECHNICAL EVALUATION

3.1 Code Requirements for Which Relief is Requested

Under the rules of IWA-4120, repairs shall be performed in accordance with the licensee's design specification and the original Construction Code. Later editions and addenda of the Construction Code or of ASME Section III, either in their entirety or portions thereof, and Code Cases may be used. For Relief Request ISIR-20, the Code Cases are N-504-2 and N-638-1, to be modified as proposed by the licensee. Relief Request ISIR-20 is also concerned with ASME Section XI, 1995 Edition including Addenda through 1996, Appendix VIII, Supplement 11, which is required to be implemented per 10 CFR 50.55a(g)(6)(ii)(C).

3.2 Licensee's Proposed Modifications to N-504-2

The licensee proposed to use N-504-2 for full structural PWOLs for the subject components with the following modifications:

(1) Use of a nickel-based alloy weld material, Alloy 52/52M/152 rather than the low carbon (0.035 percent maximum) austenitic stainless steel. In its letter of March 1, 2006, the licensee indicated that the material supplier's designation for this alloy weld material is

52MS. The “S” designates the process route that converts the hot-rolled billet into finished cold-drawn wire, and that the material properties are not affected.

(2) Relaxation from the requirement to perform delta ferrite measurements to meet the 7.5 Ferrite Number requirement of N-504-2. The Ferrite Number requirement cannot be met because the Alloy 52/52M/152 weld material is 100 percent austenitic and contains no delta ferrite.

(3) Performance of a system pressure test and an ultrasonic examination of the weld overlay using Code Case N-416-1, “Alternative Pressure Test Requirement for Welded Repairs or Installation of Replacement Items by Welding, Class 1, 2, and 3" (N-416-1), versus the hydrostatic test requirement under N-504-2.

3.2.1 Licensee’s Basis for Relief

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee stated that the weld overlay has been designed consistent with the requirements of N-504-2 with the specific thickness and length computed according to the guidance provided in the subject Code Case. The licensee stated that Alloy 52 material is highly resistant to PWSCC, and that industry operational experience has shown that PWSCC in Alloy 82/182 will blunt at the interface with stainless steel base metal, ferritic base metal, or Alloy 52/52M/152. Alloy 52 (152) or Alloy 52M (152M) will be used if local repairs of weld defects are necessary or additional weld metal is required locally to form the final PWOL contour.

Paragraph (e) of N-504-2 requires as-deposited delta ferrite measurements of at least 7.5 Ferrite Number for the weld reinforcement. The licensee proposed that delta ferrite measurements will not be performed for this overlay because the deposited Alloy 52/Alloy 52M is 100 percent austenitic and contains no delta ferrite due to the high nickel composition (approximately 60 percent nickel).

Paragraph (h) of N-504-2 requires a system hydrostatic test of the completed repair if the flaw(s) penetrated the original pressure boundary or if there is any observed indication of the flaw penetrating the pressure boundary during repair. In lieu of hydrostatic testing, a system pressure test and an ultrasonic examination of the weld overlay shall be performed in accordance with the Third Interval ISI Program and N-416-1. This modification was previously approved by the NRC staff for use by the licensee on July 24, 1995 (Accession No. 9508030133) .

3.2.2 NRC Staff Evaluation of Modifications to N-504-2

Under the rules of IWA-4120, in editions and addenda up to and including the 1989 Edition with the 1990 Addenda, repairs shall be performed in accordance with the owner’s design specification and the original Construction Code of the component or system. Later editions and addenda of the Construction Code, or of Section III, either in their entirety or portions thereof, and Code Cases may be used. In addition to the above, defects shall be removed or reduced in size in accordance with IWA-4300. Alternatively, the component may be evaluated and accepted in accordance with the design rules of either the Construction Code, or Section III, when the Construction Code was not Section III. N-504-2 is being used by the licensee to perform PWOLs for pressurizer spray, safety, relief, and surge nozzle safe-end-to-nozzle dissimilar metal welds and PWOLs for the elbow-to-safe-end welds. N-504-2 was conditionally

approved by the NRC staff for use under Regulatory Guide 1.147, Revision 14, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." Therefore, the licensee's use of N-504-2 as an alternative to the mandatory ASME Code repair provisions is acceptable to the NRC staff, provided that all conditions and provisions of the Code Case are complied with.

The first proposed modification to the N-504-2 provisions involves the use of a nickel-based alloy weld material, rather than the low carbon austenitic stainless steel. The licensee stated that Paragraph (b) of N-504-2 requires that the reinforcement weld material shall be low carbon (0.035 percemt maximum) austenitic stainless steel. In lieu of the stainless steel weld material, Alloy 52/52M/152, a consumable welding wire highly resistant to PWSCC, was proposed for the overlay weld material. The NRC staff notes that the use of 52/52M/152 material is consistent with weld filler material used to perform similar weld overlays at operating boiling-water reactor (BWR) facilities. The Electric Power Research Institute (EPRI) has performed studies in qualifying weld overlays (full structural, design, and barrier overlays) for application in BWRs; the studies have not identified any issues associated with shrinkage stress or weld contraction stresses. The similarities of design between BWR nozzles and the full structural weld PWOLs in the licensee's relief request, provide reasonable assurance that there is a correlation in the performance of weld shrinkage and weld contraction stresses in the subject weld. The NRC staff concludes, therefore, that the proposed use of Alloy 52/52M/152 weld material for the full structural PWOLs provides an acceptable level of quality and safety and is, therefore, acceptable.

The second proposed modification to the N-504-2 provisions involved Paragraph (e) of N-504-2 which requires as-deposited delta ferrite measurements of at least 7.5 Ferrite Number for the weld reinforcement. The licensee proposed not to perform delta ferrite measurements for this overlay because the deposited Alloy 52/52M/152 material is 100 percent austenitic and contains no delta ferrite due to the high nickel composition (approximately 60 percent nickel). N-504-2 allows the use of weld overlay repair by deposition of weld reinforcement on the outside surface of the pipe in lieu of mechanically reducing the defect to an acceptable flaw size. However, N-504-2 is designed for weld overlay repair of austenitic stainless steel piping. Therefore, the material requirements regarding the carbon content limitation (0.035 percent maximum) and the delta ferrite content of at least 7.5 FN, as delineated in N-504-2, paragraphs (b) and (e), apply only to austenitic stainless steel weld overlay materials to ensure its resistance to intergranular stress-corrosion cracking. These requirements are not applicable to Alloy 52/52M/152, a nickel-based material which the licensee will use for the weld overlays.

The NRC staff notes that the licensee is performing full structural PWOLs on dissimilar metal welds made of Alloy 182 material. For material compatibility in welding, the NRC staff considers that Alloy 52/52M/152 is a better choice of filler material than austenitic stainless steel material for this weld joint configuration. Alloy 52/52M/152 contains about 30 percent chromium which would provide excellent resistance to PWSCC in the reactor coolant environment. This material is identified as F-No. 43 Grouping for Ni-Cr-Fe, classification UNS N06052 Filler Metal, and has been previously approved by the NRC staff for similar applications. Therefore, the licensee's proposed use of Alloy 52/52M/152 for the weld overlays as a modification to the requirements of N-504-2, paragraphs (b) and (e), is acceptable as it will provide an acceptable level of quality and safety.

Paragraphs (g)(2) and (g)(3) of N-504-2 require that evaluations of stress shall be conducted taking into consideration the residual stresses produced by the weld overlay (WOL) with other

applied loads on the system along with potential increases in loading, including shrinkage effects, due to all the WOLs in the system. Specific acceptance criteria for the stresses will be met in accordance with the Construction Code. Accordingly, the NRC staff asked the licensee to produce the calculations to support the evaluations required by N-504-2. The licensee indicated that it had not performed the calculations and agreed to supply them to the staff prior to startup. During a conference call between the NRC staff and the licensee (see phone record at Accession No. ML060480031), and in its March 1, 2006, letter, the licensee agreed to provide the NRC staff with stress analyses summaries for the full structural PWOLs, provided the calculations necessary to support the summaries were completed. The licensee submitted the stress analyses summaries in its April 11, 2006, letter.

The licensee's proposed modification to Paragraph (h) of N-504-2 is to perform a system pressure test and an ultrasonic examination of the weld overlay in accordance with the licensee's Third Interval ISI Program and N-416-1. N-416-1 was approved for use by the staff in Regulatory Guide 1.147, Revision 12. The licensee indicated that N-416-1 was used because it was the version currently listed in its Third Interval ISI Program. The NRC staff reviewed the differences between Revisions 12 and 13 of Regulatory Guide 1.147 and noted no significant changes in the requirements between the two Code Cases, and that only the scope of applicability was changed in Revision 13. On the basis of its previous acceptance of the licensee's weld overlay qualification method (see letter to licensee regarding Performance Demonstrating Initiative (PDI) dated June 27, 2005; Accession No. ML051720006), the staff concluded that the use of N-416-1 provides an acceptable level of quality and safety.

N-416-1 requires that nondestructive examination shall be performed in accordance with the methods and acceptance criteria of the applicable subsection of the 1992 Edition of Section III. The acceptance criteria in Section III do not allow the presence of cracks, regardless of length, and is geared more towards construction type welds. The licensee's use of the post-repair nondestructive examination requirements of N-504-2 utilizing the appropriate PDI procedure as mentioned above is acceptable. The specimen sets for PDI qualification for weld overlay examinations include construction type flaws. Therefore, use of PDI-qualified personnel and procedures for the examination of the weld overlay will result in the reliable detection of construction type flaws and meets the intent of compliance with the applicable subsection of the 1992 Edition of Section III. Finally, in its safety evaluation dated June 27, 2005, the staff approved the use of the PDI's alternative implementation for weld overlay inspections in lieu of Appendix VIII, Supplement 11 requirements. Therefore, the licensee's proposed use of Code Case N-416-1, instead of the hydrostatic test requirement under Code Case N-504-2, is acceptable.

3.3 Licensee's Proposed Modifications to N-638-1

The licensee proposed to use N-638-1 for full structural PWOLs for the subject components with the following modifications:

(1) The maximum area of an individual weld, based on the finished surface over the ferritic material, shall be 500 sq. in., which is a modification to Paragraph 1.0(a). In its March 1, 2006, letter, the licensee requested to reduce the maximum area to 300 sq. in.

(2) For the application of the PWOLs, full ultrasonic testing (UT) of the 1.5T band will not be performed. This is a modification to Paragraph 4.0(b).

(3) UT and dye penetrant examinations of the areas defined under paragraph 1.0(d) would be performed 48 hours after completion of the welding versus the welding component being at ambient temperature for 48 hours. This is a modification to Paragraph 4.0(b). In its letter dated March 1, 2006, the licensee withdrew this modification.

3.3.1 Licensee's Basis for Relief

The licensee stated that the PWOLs will require welding on more than 100 sq. in. of surface on the surge nozzle low alloy steel base material. The PWOLs will extend to the transition taper of the low alloy steel nozzle so that qualified UT of the required volume can be performed. The licensee also stated that there have been a number of temper bead WOL repairs applied to safe-end-to-nozzle welds in the nuclear industry, and that a WOL repair having a 300 sq. in. surface was recently approved by the NRC staff for the Susquehanna Steam Electric Station. The licensee indicated that ASME Code Case N-432-1 (N-432-1), which is approved for use in RG 1.147, allows temper bead welding on low alloy steel nozzles without limiting the temper bead weld surface area. The two additional conditions required by N-432-1 that are not required by N-638-1, are that temper bead welds have preheat applied and that the procedure qualification be performed on the same specification, type, grade and class of material. The elevated preheat would present a radiation exposure burden when performing the repair.

The basis for not examining the full UT of the 1.5T band is that the existing nozzle configuration precludes complete coverage. The licensee stated that any major base material cracking would take place in the heat-affected zone directly below the weld overlay or in the underlying Alloy 82/182 weld deposit, and not in the required band of material out beyond the overlay. The licensee indicated that if the cracking were to occur, it would be identified by the UT of the full structural PWOLs, and that the remainder of the PWOLs would be examined by UT to the maximum extent practical.

3.3.2 NRC Staff Evaluation of Modifications to N-638-1

The licensee is applying a 360-degree, full structural PWOL to reduce the susceptibility of the original weld to the initiation and growth of PWSCC and ultimately to maintain weld integrity. The full structural PWOL will fulfill all structural requirements, independent of the existing weld. Operational experience has also shown that PWSCC in Alloy 82/182 will blunt at the interface with stainless steel base metal, carbon steel base metal, or Alloy 52/152 weld metal, if cracking were to occur.

To eliminate the need for preheat and post-weld heat treatment under the Construction Code, the industry developed a temper bead welding technique which was published as N-638-1. The NRC recently endorsed N-638-1 in RG 1.147, Revision 14. The temper bead technique carefully controls heat input and bead placement which allows subsequent welding passes to stress-relieve and temper the heat affected zones of the base material and preceding weld passes. The welding is performed with low hydrogen electrodes under a blanket of inert gas. The inert gas shields the molten metal from moisture and hydrogen. Therefore, the need for the preheat and post-weld heat treatment specified by the ASME Construction Code is not necessary to produce a sound weld using the temper bead process in N-638-1.

The licensee intends to follow the methodology of N-638-1, except paragraph 1.0(a) which requires the maximum area of an individual weld, based on the finished surface, be limited to 100 square inches, and the depth of the weld to exceed one-half of the ferritic base metal

thickness. This condition is not being met because the design for the weld overlay covers an area up to approximately 300 square inches which exceeds the limitations of N-638-1. The licensee will perform an evaluation, as noted in Section 3.2.2 of this safety evaluation, to determine the effect of exceeding the 100 square-inch area limitation for temper bead welding onto a low alloy steel nozzle. This evaluation will be conducted under the guidance of N-504-2. Paragraphs (g)(2) and (g)(3) require consideration of the residual stresses produced by the weld overlay with other applied loads on the system. The evaluation of other welds and components in the system is to consider potential increases in loading, including shrinkage effects, due to all weld overlays in the reactor coolant system. These welds and components are to meet the applicable stress limits of the Construction Code. The NRC staff considers this evaluation important in assuring that the reactor coolant system will not be adversely affected after PWOLs are deposited.

The NRC staff notes that several similar weld overlays have been applied to BWR facilities (such as Nine Mile Point 2, Perry, and Duane Arnold) with similar geometry and overlay dimensions. EPRI has performed studies to qualify weld overlays for application in BWRs, and in these applications, the studies have not identified any issues with shrinkage stresses or weld contraction stresses. The DCCNP-2 weld overlay design is generally similar to the design applied in BWR feedwater, core spray, and recirculation nozzles. Secondly, no clear basis has been documented by the ASME Code Working Group on Welding and Special Repair Processes (the group responsible for N-638-1) for the 100 square-inch area limitation. Published literature shows that compressive stress remains on the inside surface near the weld, which supports mitigation of some degradation mechanisms, such as PWSCC. In some cases, the extended overlay results in higher compressive stress than the 100 square-inch case. Thus, the residual stresses remain in compression on the inside surface of the weld as the nozzle overlay area increases. This supports mitigation of the degradation mechanism. Thus, increasing the overlay area is acceptable for this specific application, i.e., to support the mitigation of the PWSCC degradation mechanism and in this geometry (piping). Based on the preceding discussion and the NRC staff's review of the licensee's April 11, 2006 letter, stress analysis, which is required by N-504-2, the NRC staff concludes that the modification to increase the PWOL to 300 sq. in. maximum will provide an acceptable level of quality and safety and is, therefore, acceptable.

The second modification for which the licensee requested approval is that full UT of the 1.5T band will not be performed as required by Paragraph 4.0(b). In its letter of March 1, 2006, the licensee indicated that it would perform UT of the PWOL areas with both longitudinal and straight beam techniques to the maximum extent practical; the licensee reported results in its June 23, 2006, letter. The licensee showed the extent of UT coverage for the three configurations that will receive PWOLs:

Component	Percent Coverage Obtained by Scan Angle		
	0° Longitudinal Scan	25° Circ Scan	45° Axial Scan
Spray Line Nozzle	69%	48%	59%
Safety/Relief Nozzle	62%	62% (30°)	53%
Surge Line Nozzle	85%	75% (40°)	77%

The licensee indicates that the modified scan angles are appropriate to obtain the maximum extent of UT coverage of the PWOLs. In order to obtain 100 percent coverage, the licensee would have to redesign the geometries of the adjacent weld components. Secondly, in its June 23, 2006, letter, the licensee indicated that the portion of the ferritic nozzle below the PWOL is part of the weld overlay volume and was examined using PDI-qualified ultrasonic procedures. The licensee also indicated that 100 percent of the preservice examination volume was examined with no detection of any type of cracking in the PWOL examination volume. The licensee has obtained the coverage required by N-504-2 and Appendix Q and also to the maximum extent practical under N-638-1. The NRC staff concludes that the UT coverage obtained provides reasonable assurance that sound PWOL welds will be deposited and that the licensee's alternative to examine the maximum extent practical is acceptable.

Initially, the licensee indicated that it was experiencing difficulty in finding a calibration block that met the requirements of ASME SA-388, "Recommended Practice for Ultrasonic Testing and Inspection of Heavy Steel Forgings," (SA-338). However, in its December 7, 2006, letter, the licensee provided the results of an ultrasonic comparison between calibration blocks fabricated of ASME SA-216 (MP-20) and ASME SA-508 (RV-3) materials. The DCCNP-2 pressurizer material is ASME-508 material. Both calibration blocks contained a 0.5 thickness (1/2T) and 0.75 thickness (3/4T) hole. The licensee indicated that calibration requirements of SA-388 require that the calibration standard have the same nominal composition, heat treatment, and thickness as the forging that it represents. In the case of the licensee's application, the calibration block used for the field examination was fabricated from a different material than the pressurizer nozzle forging.

Section 7.3.3 of SA-388 states, in part: "A separate calibration standard may be used; however; it shall have the same nominal composition, heat treatment, and thickness as the forging it represents. The test surface finish on the calibration standard shall be comparable, but no better than the item to be examined." The licensee performed an ultrasonic comparison between the two materials and found them acoustically similar. The NRC staff reviewed the acoustical comparison results provided by the licensee under Table 1 the December 7, 2006, letter, and concludes that the results show acoustic similarity of materials. Based on the data provided by the licensee, the NRC staff concludes that the ultrasonic examination performed on the Unit 2 pressurizer material, using the substitute calibration block material which is acoustically similar, provides adequate insonification of the area of interest, and therefore, provides an acceptable level of quality and safety.

4.0 CONCLUSION

The NRC staff concludes that the licensee's Relief Request ISIR-20, including modifications to Code Cases N-504-2 and N-638-1 for DCCNP-2, for full structural PWOLs of specific welds will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the alternative for the remaining service life, including the period of extended operating, for the components specified in the licensee's submittals. All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: T. Steingass

Date: March 1, 2007

Donald C. Cook Nuclear Plant, Units 1 and 2

cc:

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
Suite 210
2443 Warrenville Road
Lisle, IL 60532-4351

Attorney General
Department of Attorney General
525 West Ottawa Street
Lansing, MI 48913

Township Supervisor
Lake Township Hall
P.O. Box 818
Bridgman, MI 49106

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
7700 Red Arrow Highway
Stevensville, MI 49127

Kimberly Harshaw, Esquire
Indiana Michigan Power Company
One Cook Place
Bridgman, MI 49106

Mayor, City of Bridgman
P.O. Box 366
Bridgman, MI 49106

Special Assistant to the Governor
Room 1 - State Capitol
Lansing, MI 48909

Susan D. Simpson
Regulatory Affairs Manager
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

Michigan Department of Environmental Quality
Waste and Hazardous Materials Div.
Hazardous Waste & Radiological Protection Section
Nuclear Facilities Unit
Constitution Hall, Lower-Level North
525 West Allegan Street
P. O. Box 30241
Lansing, MI 48909-7741

Lawrence J. Weber, Plant Manager
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

Mark A. Peifer, Site Vice President
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106