September 4, 2003

Mr. John L. Skolds, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 - RELIEF REQUEST FOR FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NOS. MB6331, MB6332, MB7562, MB7563, MB7571, MB7572, MB7573, MB7574, MB7575, MB7576, MB7577, MB7578, MB7579, MB7580, MB7581, MB7582, MB7583, MB7584, MB7585, AND MB7586)

Dear Mr. Skolds:

By letter dated September 6, 2002, Exelon Generation Company, LLC (the licensee) submitted ten requests for relief (RR) from requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for Dresden Nuclear Power Station (DNPS), Units 2 and 3. These relief requests were for the fourth 10-year inservice inspection interval scheduled to commence on January 20, 2003, and end by January 19, 2013. Additional information was provided in a letter dated May 29, 2003.

Based on the information provided in your submittal for relief request RR-14R-01, the staff concludes that compliance with the specified Code requirements would result in hardship without a compensating increase in the level of quality and safety. The proposed alternatives contained in the request for relief would provide reasonable assurance of structural integrity. Therefore, for RR-14R-01, the proposed alternatives are authorized pursuant to Section 50.55a(a)(3)(ii) of Title 10 of the *Code of Federal Regulations* (10 CFR), for the fourth 10-year inservice inspection interval at DNPS.

Similarly, for relief request RR-14R-05, the staff has determined that compliance with the specified Code requirements is impractical. The proposed alternatives contained in the request for relief would provide reasonable assurance of structural integrity. Therefore, for RR-14R-05, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(g)(6)(i), for the fourth 10-year inservice inspection interval at DNPS. Granting relief pursuant to 10 CFR 50.55a(g)(6)(i) 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.

For relief requests RR-14R-02, 03, 04, 06, 07, 08, 09, and 11, the staff concludes that the proposed alternatives would provide an acceptable level of quality and safety. Therefore, the proposed alternatives contained in the request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year inservice inspection interval at DNPS.

The enclosed safety evaluation contains the basis for this determination. Additionally, for certain relief requests, and for applications discussed in the enclosed safety evaluation, the staff has approved the use of code cases that are not yet approved for generic use in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 13, June 2003. Use of these code cases is authorized until such time as the code case is published in a future version of RG 1.147. At that time, if you intend to continue implementing these code cases, you must follow all provisions of these code cases with limitations or conditions specified in RG 1.147, if any.

Sincerely,

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos.: 50-237 and 50-249

Enclosure: Safety Evaluation

cc w/encl: See next page

The enclosed safety evaluation contains the basis for this determination. Additionally, for certain relief requests, and for applications discussed in the enclosed safety evaluation, the staff has approved the use of code cases that are not yet approved for generic use in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 13, June 2003. Use of these code cases is authorized until such time as the code case is published in a future version of RG 1.147. At that time, if you intend to continue implementing these code cases, you must follow all provisions of these code cases with limitations or conditions specified in RG 1.147, if any.

Sincerely,

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos.: 50-237 and 50-249

Enclosure: Safety Evaluation

cc w/encl: See next page

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Dresden Nuclear Power Units 2 and 3

cc:

Site Vice President - Dresden Nuclear Power Station
Exelon Generation Company, LLC
6500 N. Dresden Road
Morris, IL 60450-9765

Dresden Nuclear Power Station Plant Manager
Exelon Generation Company, LLC
6500 N. Dresden Road
Morris, IL 60450-9765

Regulatory Assurance Manager - Dresden
Exelon Generation Company, LLC
6500 N. Dresden Road
Morris, IL 60450-9765

U.S. Nuclear Regulatory Commission
Dresden Resident Inspectors Office
6500 N. Dresden Road
Morris, IL 60450-9766

Chairman
Grundy County Board
Administration Building
1320 Union Street
Morris, IL 60450

Regional Administrator
U.S. NRC, Region III
801 Warrenville Road
Lisle, IL 60532-4351

Illinois Emergency Management Agency
Division of Disaster Assistance & Preparedness
110 East Adams Street
Springfield, IL 62701-1109

Document Control Desk - Licensing
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Senior Vice President, Nuclear Services
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Vice President - Operations Support
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Chief Operating Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Vice President - Licensing and Regulatory Affairs
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Director - Licensing
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Senior Counsel, Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Manager Licensing - Dresden and Quad Cities
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOURTH 10-YEAR INTERVAL REQUEST FOR RELIEF

EXELON GENERATION COMPANY, LLC

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

Section 50.55a(g) of Title 10 of the *Code of Federal Regulations* (10 CFR) specifies that inservice inspection (ISI) of nuclear power plant components shall be performed in accordance with the requirements of the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code (Code), Section XI, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) 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. 10 CFR 50.55a(g)(5)(iii) states that if the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in Section 50.4, information to support the determinations.

By letter dated September 6, 2002, Exelon Generating Company, LLC (Exelon, the licensee), sought relief from conformance with certain requirements of ASME Code, Section XI for the fourth 10-year interval ISI program at the Dresden Nuclear Power Station (DNPS) scheduled to commence on January 20, 2003, and be completed by January 19, 2013. Additional information was provided in a letter dated May 29, 2003.

2.0 BACKGROUND

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 applicable ISI Code of Record for the fourth 10-year ISI interval of Dresden Nuclear Power Station (DNPS), Units 2 and 3, is the 1995 Edition with 1996 Addenda of ASME Code, Section XI.

3.0 REGULATORY EVALUATION

The information provided by the licensee in support of the relief request has been evaluated and the basis for disposition are documented below.

3.1 RELIEF REQUEST 14R-01

Component Identification (as stated)

Code Class:	1
Reference:	IWB-2500, Table IWB-2500-1
Examination Category:	B-D
Item Number:	B3.100
Description:	Inspection of Standby Liquid Control Nozzle Inner Radius.
Component Number:	Unit 2: N12-1; Unit 3: N12-1

Code Requirement (as stated):

IWB-2500 states that components shall be examined and tested as specified in Table IWB-2500-1. Table IWB-2500-1 requires a volumetric examination to be performed on the inner radius section of all reactor pressure vessel nozzles each inspection interval.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code requirements is impractical.

The Standby Liquid Control (SBLC) nozzle, as shown in Figure 14R-01.1,[1] is designed with an integral socket to which the boron injection piping is fillet welded. The SBLC nozzle is located near the bottom of the vessel in an area which is inaccessible for ultrasonic examinations from the inside of the vessel. Therefore, ultrasonic examinations would need to be performed from the outside diameter of the vessel. As shown in Figure 14R-01.1, the ultrasonic scan would need to travel through the full thickness of the vessel into a complex cladding/socket configuration. These geometric and material reflectors inherent in the design prevent a meaningful examination from being performed on the inner radius of the SBLC nozzle.

In addition, the inner radius socket attaches to piping which injects boron at locations far removed from the nozzle. Therefore, the SBLC nozzle inner radius is not subjected to turbulent mixing conditions that are a concern at other nozzles.

Proposed Alternate Examination (as stated):

As an alternate examination, DNPS will perform a VT-2 visual examination of the subject nozzles each refueling outage in conjunction with the Class 1 System Leakage Test.

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[1] Refer to licensee submittal dated September 6, 2002

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

By letter dated September 6, 2002, the licensee submitted request for relief 14R-01 pursuant to 10 CFR 50.55a(g)(5)(iii) on the basis that conformance with the Code requirements is impractical. The licensee sought relief from the requirements of ASME Code, Section XI, to perform volumetric examination on the inner radius of the SBLC nozzle. Subsection IWB-2500 of ASME Section XI requires that a volumetric examination be performed on the inner radius section of all reactor pressure vessel nozzles each inspection interval. As an alternative examination, the licensee proposed to perform a VT-2 visual examination of the inner radius of the SBLC nozzle each refueling outage in conjunction with the Class 1 System Leakage Test. The proposed relief is sought for the fourth ten-year ISI interval. The DNPS fourth ten-year ISI program plan meets the requirements of ASME Code, Section XI, 1995 Edition with 1996 Addenda.

The licensee stated that the SBLC nozzle is designed with an integral socket to which the boron injection piping is welded. The SBLC nozzle is located near the bottom of the vessel in an area which is inaccessible for ultrasonic examinations from the inside of the vessel. Therefore, ultrasonic examinations would need to be performed from the outside diameter of the vessel which would result in a need for the ultrasonic scan to travel through the full thickness of the vessel into a complex cladding/socket configuration. Because of these geometric and material reflectors inherent in the design, a meaningful ultrasonic examination cannot be performed on the inner radius of the SBLC nozzle. In addition, the licensee stated that the inner radius socket is attached to piping which injects boron at locations far removed from the nozzle and thus the SBLC nozzle inner radius is not subjected to turbulent mixing conditions which may degrade the inner radius of the nozzle.

The staff finds the licensee's reasoning in support of its request for relief acceptable. Requiring the licensee to perform ultrasonic examination on the inner radius of the SBLC nozzle would result in hardship without a compensating increase in the level of quality and safety because the geometric and material reflectors inherent in the design of the SBLC nozzle preclude the performance of a meaningful ultrasonic examination on the inner radius of the SBLC nozzle. Further, because the inner radius socket attaches to piping which injects boron at locations far removed from the nozzle, the SBLC nozzle inner radius is not subjected to turbulent mixing conditions and therefore inner radius degradation of the SBLC nozzle is unlikely. The licensee has proposed to perform a VT-2 visual examination of the area external to the SBLC nozzle each refueling outage in conjunction with the Class 1 System Leakage Test. The VT-2 visual examination can detect leakage through the nozzle so that corrective action can be implemented in the unlikely event that some type of degradation takes place at the inner radius of the SBLC nozzle.

Conclusion

Based on the information provided in the licensee's submittal, the NRC staff has determined that compliance with the specific requirements of the ASME Code, Section XI discussed above

would result in hardship without a compensating increase in the level of quality and safety because the geometric and material reflectors inherent in the design of the SBLC nozzle preclude the performance of a meaningful ultrasonic examination on the inner radius of the SBLC nozzle. In addition, the staff concludes that the proposed alternative, as described in 14R-01, provides reasonable assurance of structural integrity. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the fourth 10-year ISI intervals at DNPS.

3.2 RELIEF REQUEST 14R-02

Component Identification (as stated):

Code Class:	1 and 2
Examination Category:	B-F, B-J, C-F-1, and C-F-2
Item Number:	B5.10, B5.20, B9.11, B9.21, B9.31, B9.32, B9.40, C5.11, C5.41, C5.51, C5.70, and C5.81
Description:	Alternate Risk-Informed Selection and Examination Criteria for Category B-F, B-J, C-F-1, and C-F-2 Pressure Retaining Piping Welds
Component Number:	Pressure Retaining Welds
Reference:	1) Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure" 2) W. H. Bateman (USNRC) to G. L. Vine (EPRI) letter dated October 28, 1999, transmitting "Safety Evaluation Report Related to EPRI Risk-Informed Inservice Inspection Evaluation Procedure (EPRI TR-112657, Revision B, July 1999)" 3) Initial Risk-Informed Inservice Inspection Evaluation - Dresden Nuclear Power Station Units 2 and 3 (Dated July 2000) 4) American Society of Mechanical Engineers (ASME) Code Case N-578-1, "Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B" 5) A. J. Mendiola (USNRC) to O. D. Kingsley (Exelon) letter dated September 5, 2001, transmitting "Safety Evaluation of Third Interval Risk-Informed Inservice Inspection Program Relief Request" 6) NRC Regulatory Guide 1.178, “An Approach for Plant-Specific Risk-Informed Decision Making: Inservice Inspection of Piping,” September 1998[2] 7) NRC NUREG-0800, Chapter 3.9.8, “Standard Review Plan for Trial Use for the Review of Risk-Informed Inservice Inspection of Piping,” September 1998[2]

[2] Reference added by the NRC staff

Code Requirement (as stated):

Table IWB-2500-1, Examination Category B-F, requires volumetric and/or surface examinations on all welds for Items B5.10 and B5.20.

Table IWB 2500-1, Examination Category B-J, requires volumetric and/or surface examinations on a sample of welds for Items B9.11, B9.21, B9.31, B9.32, and B9.40. The weld population selected for inspection includes the following:

1. All terminal ends in each pipe or branch run connected to vessels.

2. All terminal ends and joints in each pipe or branch run connected to other components where the stress levels exceed either of the following limits under loads associated with specific seismic events and operational conditions:

    a. primary plus secondary stress intensity range of $2.4S_m$ for ferritic steel and austenitic steel.
    b. cumulative usage factor U of 0.4.

3. All dissimilar metal welds not covered under Category B-F.

4. Additional piping welds so that the total number of circumferential butt welds, branch connections, or socket welds selected for examination equals 25% of the circumferential butt welds, branch connection, or socket welds in the reactor coolant piping system. This total does not include welds excluded by IWB-1220.

Table IWC-2500-1, Examination Categories C-F-I and C-F-2 require volumetric and/or surface examinations on a sample of welds for Items C5.11, C5.41, C5.51, C5.70, and C5.81. The weld population selected for inspection includes the following:

1. Welds selected for examination shall include 7.5%, but not less than 28 welds, of all dissimilar metal, austenitic stainless steel and high alloy welds (Category C-F-1) or of all carbon and low alloy steel welds (Category C-F-2) not exempted by IWC-1220. (Some welds not exempted by IWC-1220 are not required to be nondestructively examined per Examination Categories C-F-1 and C-F-2. These welds, however, shall be included in the total weld count to which the 7.5% sampling rate is applied.) The examinations shall be distributed as follows:

    a. the examinations shall be distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt dissimilar metal, austenitic stainless steel and high alloy welds (Category C-F-1) or carbon and low alloy welds (Category C-F-2) in each system;
    b. within a system, the examinations shall be distributed among terminal ends, dissimilar metal welds, and structural discontinuities prorated, to the degree practicable, on the number of nonexempt terminal ends, dissimilar metal welds, and structural discontinuities in the system; and
    c. within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.5 5a(a)(3)(i), relief is requested on the basis that the proposed alternative utilizing Reference 1 along with two enhancements from Reference 4 will provide an acceptable level of quality and safety.

As stated in "Safety Evaluation Report Related to EPRI Risk-Informed Inservice Inspection Evaluation Procedure (EPRI TR-112657, Revision B, July 1999)" (Reference 2):

> The staff concludes that the proposed RI-ISI program as described in EPRI TR-1 12657, Revision B, is a sound technical approach and will provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a for the proposed alternative to the piping ISI requirements with regard to the number of locations, locations of inspections, and methods of inspection.

The initial DNPS RISI (Risk-Informed Inservice Inspection) Program was submitted during the Third Period of the third interval for both Units 2 and 3. This initial RISI program was developed in accordance with EPRI TR-112657, Revision B-A, as supplemented by Code Case N-578-1. The program was approved for use by the USNRC via Safety Evaluation as transmitted to Exelon on September 5, 2001 (Reference 5).

The transition from the 1989 Edition to the 1995 Edition with the 1996 Addenda of ASME Section XI for DNPS's fourth interval does not impact the currently approved Risk-Informed ISI evaluation process used in the third interval, and the requirements of the new Code edition/addenda will be implemented as detailed in the DNPS ISI Program Plan.

The Risk Impact Assessment completed as part of the original baseline RISI Program was an implementation/transition check on the initial impact of converting from a traditional ASME Section XI program to the new RISI methodology. For the fourth interval ISI update, there is no transition occurring between two different methodologies, but rather, the currently approved RISI methodology and evaluation will be maintained for the new interval. As such, the initial screening of the risk impact assessment is not a part of the living program process and is not required to be continually updated.

The actual evaluation and ranking procedure including the Consequence Evaluation and Degradation Mechanism Assessment processes of the currently approved (Reference 5) RISI Program remain unchanged and are continually applied to maintain the Risk Categorization and Element Selection methods of EPRI TR-112657, Revision B-A. These portions of the RISI Program are reevaluated as major revisions of the site PRA occur and modifications to plant configuration are made. The Consequence Evaluation, Degradation Mechanism Assessment, Risk Ranking, and Element Selection steps define the living program process applicable to the RISI Program.

Proposed Alternate Provisions (as stated):

The proposed alternative originally implemented in the "Risk Informed Inservice Inspection Plan, Dresden Units 2 and 3" (Reference 3), along with the two enhancements noted below,

provide an acceptable level of quality and safety as required by 10 CFR 50.55a(a)(3)(i). This original program along with these same two enhancements is currently approved for DNPS's third inspection interval as documented in Reference 5.

The fourth interval RISI Program will be a continuation of the current application and will continue to be a living program as described in the Basis For Relief above. No changes to the evaluation methodology as currently implemented under EPRI TR-112657, Revision B-A, are required as part of this interval update. The following two enhancements will continue to be implemented.

> In lieu of the evaluation and sample expansion requirements in Section 3.6.6.2, "RI-ISI Selected Examinations" of EPRI TR-112657, DNPS will utilize the requirements of Subarticle -2430, "Additional Examinations" contained in Code Case N-578-1 (Reference 4). The alternative criteria for additional examinations contained in Code Case N-578-1 provides a more refined methodology for implementing necessary additional examinations.
>
> To supplement the requirements listed in Table 4-1, "Summary of Degradation-Specific Inspection Requirements and Examination Methods" of EPRI TR-112657, DNPS will utilize the provisions listed in Table 1, Examination Category R-A, "Risk-Informed Piping Examinations" contained in Code Case N-578-1 (Reference 4). To implement Note 10 of this table, paragraphs and figures from the 1995 Edition with the 1996 Addenda of ASME Section XI (DNPS's code of record for the fourth interval) will be utilized which parallel those referenced in the Code Case for the 1989 Edition. Table I of Code Case N-578-1 will be used as it provides a more detailed breakdown for examination method and categorization of parts to be examined.

The DNPS RISI Program, as developed in accordance with EPRI TR-112657, Rev. B-A (Reference 1), requires that 25 percent of the elements that are categorized as "High" risk (i.e., Risk Category 1, 2, and 3) and 10% of the elements that are categorized as "Medium" risk (i.e., Risk Categories 4 and 5) be selected for inspection. For this application, the guidance for the examination volume for a given degradation mechanism is provided by the EPRI TR-112657 while the guidance for the examination method and categorization of parts to be examined are provided by the EPRI TR-112657 as supplemented by Code Case N-578-1.

In addition to this risk-informed evaluation, selection, and examination procedure, all ASME Section XI piping components, regardless of risk classification, will continue to receive Code required pressure testing as part of the current ASME Section XI program. VT-2 visual examinations are scheduled in accordance with the DNPS pressure testing program, which remains unaffected by the RISI program.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

By letter dated September 6, 2002 Exelon Generating Company, LLC (Exelon, the licensee) submitted a request for relief pursuant to 10 CFR 50.55a(a)(3)(i). The licensee sought relief from the requirements of ASME Code, Section XI to utilize a risk-informed ISI program plan at its Dresden Nuclear Power Station Units 2 and 3 (DNPS) to do inservice inspections during the fourth interval. Additional information was provided by the licensee by letter dated May 29, 2003. A risk-informed ISI program was reviewed and approved by the NRC prior for use during the third interval at DNPS. In the September 6, 2002, letter, the licensee stated that the ranking and evaluation procedures of the RI-ISI program for the third interval remain unchanged. In the May 29, 2003, letter, the licensee identified the changes in inspection locations between the third interval program and the proposed fourth interval program.

The licensee is requesting relief to use the proposed RI-ISI program plan in the fourth interval instead of the ASME Section XI program. An acceptable RI-ISI program plan is expected to meet the five key principles discussed in RG 1.178, SRP 3.9.8, and the EPRI Topical Report EPRI TR-112657, Rev. B-A (Refs. 6, 7, and 1). The first principle is met in this relief request because an alternative inservice inspection program may be authorized pursuant to 10 CFR 50.55a(3)(i). The second and third principles require assurance that the alternative program is consistent with the defense-in-depth philosophy and that sufficient safety margins are maintained, respectively. Assurance that the second and third principles are met is based on the application of the approved methodology and not on the particular inspection locations selected. The methodology used to develop the fourth interval RI-ISI program is unchanged from the methodology approved for use in third interval and therefore the second and third principles are met. The fourth principle, that any increase in core damage frequency and risk are small and consistent with the Commission's Safety Goal Policy statement, requires an estimate of the change in risk, and the change in risk estimate is dependent on the location of inspections in the proposed ISI program compared to the location of inspections that would be inspected using the requirements of ASME Section XI.

In the letter dated May 29, 2003, Exelon summarized the changes in inspection locations between the third and the fourth intervals. Exelon reported the total change in risk estimates based on comparison of the fourth interval RI-ISI program plan with that of the ASME Section XI requirements from which relief was granted in Reference 3. Relief was granted in Reference 3 from selected requirements in the 1989 Edition of Section XI, the licensee's Code of Record when relief was requested. The Code requirements stated above and from which relief is being requested have not been changed between the 1989 Edition and the 1995 Edition with the 1996 Addenda and the staff finds the comparison appropriate and acceptable. The licensee reported in the May 29, 2003, letter that the total change in risk and system level change in risk estimates for the proposed fourth interval program are within the acceptance guidelines in the EPRI topical report. The staff finds that the change in risk estimate is appropriate and the results provide assurance that the fourth key principle is met.

The licensee stated that the fourth interval ISI program plan will continue to be a living program. Maintenance of a living program is also unaffected by the relocation of inspections and, therefore, the fifth key principle which provides that risk-informed applications should include performance monitoring and feedback provisions is met.

Based on the above discussion, the staff finds that the five key principles of risk-informed decision-making are ensured by the licensee proposed fourth interval RI-ISI program plan. Although Code Case N-578-1 has not been approved by the NRC for generic use in Regulatory Guide 1.147, “Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1,” Revision 13, June 2003, the staff finds the specific application as discussed above is acceptable. Therefore, the proposed program for the fourth interval is acceptable. Use of the code case is authorized until such time as the code case is published in a future version of RG 1.147. At that time, if the licensee intends to continue implementing the code case, it must follow all provisions of Code Case N-578-1 with limitations or conditions specified in RG 1.147, if any.

Conclusion

Based on the information provided in the licensee’s submittals, the NRC staff has determined that the proposed alternative, as described in Relief Request 14R-02, provides an acceptable level of quality and safety. Therefore, Relief Request 14R-02 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year inservice inspection interval at DNPS.

3.3 RELIEF REQUEST 14R-03

Component Identification (as stated):

Code Class:	All
Reference:	ASME Section XI, Appendix VII, Subsubarticle VII-4240, "Annual Training"
Examination Category:	All categories for components subject to Ultrasonic Examination
Number:	All item numbers for components subject to Ultrasonic Examination
Description:	Alternative Requirements to ASME Section XI, Appendix VII, Subsubarticle VII-240, "Annual Training"
Component Number:	All Components Subject to Ultrasonic Examination

Code Requirement (as stated):

10 CFR 50.55a, "Codes and Standards," Paragraph (b)(2) incorporates by reference, the 1995 Edition and Addenda through 1996 of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code for use in preparing inservice inspection programs. Subsubarticle VII-4240, "Annual Training," of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VII, requires a minimum of 10 hours annual training.

10 CFR 50.55a(b)(2)(xiv), "Appendix VIII personnel qualification," requires that all personnel qualified to perform ultrasonic examinations in accordance with ASME Section XI, Appendix VIII, shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested from the training provision of Subsubarticle VII-4240 of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VII, that requires a minimum of 10 hours annual training. The basis of the relief request is that the proposed alternative would provide an acceptable level of quality and safety.

On September 22, 1999, the USNRC published a final rule in the *Federal Register* (64 FR 51370) to amend 10 CFR 50.55a(b)(2), to incorporate by reference the 1995 Edition and addenda through the 1996 Addenda, of ASME Section XI. The change included the requirement to have a minimum of 10 hours of annual training contained in Subsubarticle VII-4240 of ASME Section XI.

Additionally, the September 22, 1999, *Federal Register* notice amended 10 CFR 50.55a(b)(2)(xiv). The amended 10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified to perform ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be taken no earlier than 6 months prior to performing examinations at a licensee's facility. Paragraph 2.4.1.1.1 in the *Federal Register* notice contained the following statement which includes a discussion of the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) program.

> The USNRC had determined that this requirement (i.e., Subsubarticle VII-4240) was inadequate for two reasons. The first reason was that the training does not require laboratory work and examination of flawed specimens. Signals can be difficult to interpret and, as detailed in the regulatory analysis for this rulemaking, experience and studies indicate that the examiner must practice on a frequent basis to maintain the capability for proper interpretation. The second reason is related to the length of training and its frequency. Studies have shown that an examiner's capability begins to diminish within approximately 6 months if skills are not maintained. Thus, the USNRC had determined that 10 hours of annual training is not sufficient practice to maintain skills, and that an examiner must practice on a more frequent basis to maintain proper skill level... The PDI program has adopted a requirement for 8 hours of training, but it is required to be hands-on practice. In addition, the training must be taken no earlier than 6 months prior to performing examinations at a licensee's facility. PDI believes that 8 hours will be acceptable relative to an examiner's abilities in this highly specialized skill area because personnel can gain knowledge of new developments, material failure modes, and other pertinent technical topics through other means. Thus, the USNRC has decided to adopt in the Final Rule the PDI position on this matter. These changes are reflected in 10 CFR 50.55a(b)(2)(xiv) of the final rule.

Implementation of the training requirements contained in Subsubarticle VII-4240 of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VII and 10 CFR 50.55a(b)(2)(xiv) will result in redundant training programs. The approval of this relief request, to qualify our personnel to perform ultrasonic examinations in accordance with 10 CFR 50.55a(b)(2)(xiv), will simplify record keeping, satisfy the need to maintain skills, and provide an acceptable level of quality and safety.

Proposed Alternative Provisions (as stated):

Annual ultrasonic training shall be conducted in accordance with 10 CFR 50.55a(b)(2)(xiv) in lieu of Subsubarticle VII-4240 of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VII. The annual ultrasonic training shall require that all personnel qualified for performing ultrasonic examinations in accordance with ASME Section XI, Appendix VIII, shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

Subsubarticle VII-4240 of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VII, requires a minimum of 10 hours annual training. In lieu of the Code requirement, the licensee proposed to conduct annual ultrasonic training of personnel in accordance with the provisions of 10 CFR 50.55a(b)(2)(xiv). The annual ultrasonic training will require that all personnel qualified to perform ultrasonic examinations in accordance with ASME Section XI, Appendix VIII, shall receive 8 hours of annual hands-on training on specimens that contain cracks. The training will be completed no earlier than 6 months prior to performing ultrasonic examinations at the licensee's facility. The proposed relief is sought for the fourth ten-year ISI interval. The DNPS fourth ten-year ISI program plan meets the requirements of ASME Code, Section XI, 1995 Edition with 1996 Addenda.

The staff finds the licensee's reasoning in support of its request for relief acceptable. Requiring the licensee to train its ultrasonic examination personnel in accordance with both the training requirements of the ASME Code, Section XI and 10 CFR 50.55a(b)(2)(xiv) will result in the establishment of two training programs with additional record keeping associated with the two training programs. Training personnel to perform ultrasonic examinations in accordance with 10 CFR 50.55a(b)(2)(xiv), has been determined to provide an acceptable level of quality and safety, will simplify record keeping, and satisfy the need to maintain skills.

Conclusion

Based on the information provided in the licensee's submittal, the NRC staff has determined that the proposed alternative, as described in 14R-03, provides an acceptable level of quality and safety. This is based on the fact that all personnel qualified to perform ultrasonic examinations in accordance with ASME Section XI, Appendix VIII, will receive 8 hours of annual hands-on training on specimens that contain cracks in accordance with 10 CFR 50.55a(b)(2)(xiv). This training will ensure that flaws, if present in nuclear power components, will be identified during the performance of ultrasonic examinations and thus ensure an acceptable level of component quality and safety. Relief Request 14R-03 is, therefore, authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS.

3.4 RELIEF REQUEST 14R-04

Component Identification (as stated):

Code Class:	1
Reference:	ASME Section XI, Table IWB-2500-1, ASME Section XI, Appendix VIII, Supplement 4, Subparagraph 3.2(c)
Examination Category:	B-A
Item Number:	B1.10, B1.11, B1.12, B1.20, B1.21, B1.22, B1.50, B1.51
Description:	Alternative Requirements to Appendix VIII, Supplement 4, "Qualification Requirements for the Clad/Base Metal Interface of Reactor Pressure Vessel"
Component Number:	All Components

Code Requirements (as stated):

10 CFR 50.55a(b)(2) incorporates by reference, the 1995 Edition with the 1996 Addenda of ASME Section XI for use in preparing inservice inspection programs.

Subparagraph 3.2(c) of ASME Section XI, Appendix VIII, Supplement 4, requires that the ultrasonic testing (UT) performance demonstration results be plotted on a two dimensional plot with the measured depth plotted along the ordinate axis and the true depth plotted along the abscissa axis. For qualification, the plot must satisfy the statistical parameters identified in Subparagraph 3.2(c).

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested from the statistical parameters identified in Subparagraph 3.2(c) of ASME Section XI, Appendix VIII, Supplement 4. The basis of the relief requests is that the proposed alternatives would provide an acceptable level of quality and safety.

On September 22, 1999, the USNRC published a final rule in the *Federal Register* (64 FR 51378) to amend 10 CFR 50.55a(b)(2), to incorporate by reference the 1995 Edition and addenda through the 1996 Addenda, of ASME Section XI. The change included the provisions of Subparagraph 3.2(a), 3.2(b) and 3.2(c) of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 4.

Additionally, the September 22, 1999, *Federal Register* amended 10 CFR 50.55a(b)(2)(xv)(C)(1). The amended 10 CFR 50.55a(b)(2)(xv)(C)(1), requires a depth sizing acceptance criterion of 0.15 inch Root Mean Square (RMS) to be used in lieu of the requirements of Subparagraph 3.2(a) and 3.2(b) of ASME Section XI, Appendix VIII, Supplement 4.

On March 26, 2001, the USNRC published a correction to the September 22, 1999, final rule in the *Federal Register* (66 FR 16390). The USNRC identified that an error had occurred in the published wording of 10 CFR 50.55a(b)(2)(xv)(C)(1). The corrected 10 CFR 50.55a(b)(2)(xv)(C)(1), requires a depth sizing acceptance criterion of 0.15 inch Root Mean

Square (RMS) to be used in lieu of the requirements of Subparagraph 3.2(a) and a length sizing requirement of 0.75 inch RMS to be used in lieu of the requirements 3.2(b) of ASME Section XI, Appendix VIII, Supplement 4.

The statistical parameters to be used in flaw sizing specified in Subparagraph 3.2(c) of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 4, rely upon the depth sizing acceptance criteria used in Subparagraph 3.2(a) and the length sizing acceptance criteria used in Subparagraph 3.2(b). For Supplement 4 UT performance demonstrations, the linear regression line of the data required by Subparagraph 3.2(c) is not applicable because the performance demonstrations are performed on test specimens with flaws located on the inner 15% through-wall. Additionally, the Subparagraph 3.2(c) specified value for evaluating the mean deviation of flaw depth is not restrictive enough for evaluating flaw depths within the inner 15% of wall thickness. We propose to use the 10 CFR 50.55a(b)(2)(xv)(C)(1) RMS calculations of Subparagraph 3.2(a), which utilizes an RMS value of 0.15 inch depth and the RMS calculations of Subparagraph 3.2(b), which utilizes an RMS value of 0.75 inch length, in lieu of the statistical parameters of 3.2(c).

Proposed Alternative Provisions (as stated):

The RMS calculations of Subparagraph 3.2(a) of ASME Section XI, Appendix VIII, Supplement 4, which utilize an RMS value of 0.15 depth and the RMS calculations of Subparagraph 3.2(b), which utilizes an RMS value of 0.75 length shall be used in lieu of the statistical parameters of Subparagraph 3.2(c) of ASME Section XI, Appendix VIII, Supplement 4.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

The licensee proposed eliminating the use of Supplement 4, Subparagraph 3.2(c) which imposes three statistical parameters for depth sizing. The first parameter, 3.2(c)(1), pertains to the slope of a linear regression line. The linear regression line is the difference between actual versus true value plotted along a through-wall thickness. For Supplement 4 performance demonstrations, a linear regression line of the data is not applicable because the performance demonstrations are performed on test specimens with flaws located in the inner 15% through-wall. The differences between actual versus true value produce a tight grouping of results which resemble a shot gun pattern. The slope of a regression line from such data is extremely sensitive to small variations, thus making the parameter of Subparagraph 3.2(c)(1) a poor and inappropriate acceptance criterion.

The second parameter, 3.2(c)(2), pertains to the mean deviation of flaw depth. The value used in the code is too lax with respect to evaluating flaw depths within the inner 15% of wall thickness. Therefore, the licensee proposed to use the more appropriate criterion of 0.15 inch RMS of 10 CFR 50.55a(b)(2)(xv)(C)(1), which modifies Subparagraph 3.2(a), as the acceptance criterion.

The third parameter, 3.2(c)(3), pertains to a correlation coefficient. The value of the correlation coefficient in Subparagraph 3.2(c)(3) is inappropriate for this application since it is based on the linear regression from Subparagraph 3.2(c)(1).

Based on the above, the NRC staff believes that the use of Subparagraph 3.2(c) requirements in this context is inappropriate and that the proposed alternative to use the RMS value of 10 CFR 50.55a(b)(2)(xv)(C)(1), which modifies the criterion of Appendix VIII, Supplement 4, Subparagraph 3.2(a), in lieu of Subparagraph 3.2(c) will provide an acceptable level of quality and safety.

Conclusions

Based on the information provided in the licensee's submittal, the NRC staff has determined that the licensee has provided an alternative to the requirements of ASME Code, Section XI, appendix VIII which provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS.

3.5 RELIEF REQUEST 14R-05

Component Identification (as stated):

Code Class: 2
Reference: Table IWC-2500-1
Examination Category: C-H
Item Number: C7. 10, C7.3 0, C7.50, C7.70
Description: Exemption From Pressure Testing Reactor Pressure Vessel Head Flange Seal Leak Detection System
Component Number:

Unit No.	Drawing	Test Block No.
Unit 2	M-26 SH.1	2NB01
Unit 3	M-357 SH.1	3NB01

Code Requirement (as stated):

Table IWC-2500-1 requires a Visual VT-2 examination to be performed during a system leakage test.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives provide an acceptable level of quality and safety.

The Reactor Pressure Vessel Head Flange Leak Detection Line is separated from the reactor pressure boundary by one passive membrane, a silver plated O-ring located on the vessel flange. A second O-ring is located on the opposite side of the tap in the vessel flange (See

Figure 14R-05.2).[3] This line is required during plant operation in order to indicate failure of the inner flange seal O-ring. Failure of the O-ring would result in the annunciation of a High Level Alarm in the control room. On this annunciation, control room operators would quantify the leakage rate from the O-ring and then isolate the leak detection line from the drywell sump by closing the AO 2(3)-220-51 valve (see Figure 14R-05.1)[3]. This action is taken in order to prevent steam cutting of the O-ring and the vessel flange. Failure of the inner O-ring is the only condition under which this line is pressurized.

The configuration of this system precludes manual testing while the vessel head is removed because the odd configuration of the vessel tap (See Figure 14R-05.2)[3] coupled with the high test pressure requirement (1000 psig minimum), prevents the tap in the flange from being temporarily plugged. The opening in the flange is only 3/16 of an inch in diameter and is smooth walled making a high pressure temporary seal very difficult. Failure of this seal could possibly cause ejection of the device used for plugging into the vessel.

A pneumatic test performed with the head installed is precluded due to the configuration of the top head. The top head of the vessel contains two grooves that hold the O-rings. The O-rings are held in place by a series of retainer clips spaced 15^0 apart. The retainer clips are contained in a recessed cavity in the top head (see Figure 14R-05.3).[3] If a pressure test was performed with the head on, the inner O-ring would be pressurized in a direction opposite to what it would see in normal operation. This test pressure would result in a net inward force on the O-ring that would tend to push it into the recessed cavity that houses the retainer clips. The O-ring material is only .050" thick with a silver plating thickness of .004" to .006" and could very likely be damaged by this deformation into the recessed areas on the top head.

In addition to the problems associated with the O-ring design that preclude this testing it is also questionable whether a pneumatic test is appropriate for this line. Although the line will initially contain steam if the inner O-ring leaks, the system actually detects leakage rate by measuring the level of condensate in a collection chamber. This would make the system medium water at the level switch. Finally, the use of a pneumatic test performed at a minimum of 1000 psig would represent an unnecessary risk in safety for the inspectors and test engineers in the unlikely event of a test failure, due to the large amount of stored energy contained in air pressurized to 1000 psig.

System leakage testing of this line is precluded because the line will only be pressurized in the event of a failure of the inner O-ring. It is extremely impractical to purposely fail the inner O-ring in order to perform a test.

Based on the above, DNPS requests relief from the ASME Section XI requirements for system leakage testing of the Reactor Pressure Vessel Head Flange Seal Leak Detection System.

Proposed Alternate Examination (as stated):

A VT-2 visual examination will be performed on the line during vessel flood-up in a refueling outage. The static head developed due to the water above the vessel flange during flood-up will allow for the detection of any gross indications in the line. This examination will be

[3] Figures are not included in this Safety Evaluation

performed with the frequency specified by Table IWC-2500-1 for a System Leakage Test (once each inspection period).

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

By letter dated September 6, 2002, Exelon Generating Company, LLC (Exelon, the licensee) submitted a request for relief pursuant to 10 CFR 50.55a(a)(3)(i). The licensee sought relief from the requirements of Table IWC-2500-1 of ASME Section XI to perform visual (VT-2) examination of the reactor pressure vessel head flange seal leak detection system during a system leakage test. Instead, the licensee proposed to conduct VT-2 visual examination of the line during vessel flood-up in a refueling outage. The static head developed due to the water above the vessel flange during flood-up will allow for the detection of gross leakage in the line. The alternate VT-2 examination will be performed with the frequency specified by Table IWC-2500-1 for a System Leakage Test which is once each inspection period. The proposed relief is sought for the fourth ten-year ISI interval. The DNPS fourth ten-year ISI program plan meets the requirements of ASME Code, Section XI, 1995 Edition with 1996 Addenda.

The staff finds the licensee's reasoning in support of its request for relief acceptable. This line is not normally pressurized during start up or normal operation, and thus, is not exposed to the conditions necessary for performing a system leakage test. Requiring the licensee to perform a pneumatic test with the head installed is not practical because according to the licensee if a pressure test is performed with the head on, the inner O-ring would be pressurized in a direction opposite to what it would see in normal operation. This test pressure would result in a net inward force on the O-ring that would tend to push it into the recessed cavity that houses the retainer clips. The O-ring material is only 0.050" thick with a silver plating thickness of 0.004" to 0.006" and could very likely be damaged by this deformation into the recessed areas on the top head. Furthermore, the configuration of this system precludes manual testing while the vessel head is removed because the configuration of the vessel tap prevents it from being temporarily plugged. As a result, the NRC staff concludes that compliance with the specified ASME Code requirements is impractical.

Conclusions

Based on the information provided in the licensee's submittal, the NRC staff has determined that compliance with the specified ASME Code requirements is impractical, and that the proposed alternative, as described in 14R-05, provides reasonable assurance of structural integrity. The static head developed due to the water above the vessel flange during flood-up will allow for the detection of gross leakage in the line and thus will ensure an acceptable level of component integrity. The alternate VT-2 examination will be performed with the frequency specified by Table IWC-2500-1 for a System Leakage Test which is once each inspection period. Therefore, request for relief 14R-05 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI intervals at DNPS. Granting relief pursuant to 10 CFR 50.55a(g)(6)(i) 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.

3.6 RELIEF REQUEST 14R-06

Component Identification (as stated):

Code Class: 3
Reference: Table IWD-2500-1
Examination Category: D-B
Item Number: D2.10, D2.20, D2.30, D2.40, D2.50, D2.60, D2.70, D2.80
Description: Testing Frequency for Isolation Condenser Shell Side and Vent Piping
Component Number:

Unit No.	Drawing	Test Block No.
Unit 2	M-28, M-39	2IC01, 2IC02
Unit 3	M-359, M-369	3IC01, 3IC02

Code Requirement (as stated):

IWD-5222(b) states that in the case of atmospheric storage tanks, the nominal hydrostatic head, developed with the tank filled to its design capacity, shall be acceptable as the system test pressure.

Table IWD-2500-1 requires a system leakage test once each period and a system hydrostatic test once each inspection interval (DNPS utilizes Code Case N-498-1 to perform a system leakage test in lieu of the hydrostatic test).

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives provide an acceptable level of quality and safety.

The Isolation Condenser does not have a design level. Instead, it has a design pressure. The design pressure of the shell side of the Isolation Condenser is 25 psig. It is impossible to develop this pressure in the Isolation Condenser shell side because the condenser is vented to the atmosphere through a nonisolable line and the condenser is only 12 ft in height. A hydrostatic head of 25 psig would correspond to approximately 58 ft of water.

Although the shell side of the condenser is designed for 25 psig, the system is normally operated with the Isolation Condenser water at a level greater than or equal to 6 ft. It would be an abnormal activity and would be impractical to fill the Isolation Condenser to the top simply to achieve a few more pounds of static head pressure. This water would have to be drained and processed by radwaste.

The 3.0 psig difference in test pressure (with the Isolation Condenser filled to the top vs. the minimum operating level) is so slight that a test with the Isolation Condenser filled to the normal operating level is essentially the same as a test with the Isolation Condenser filled to the top. Once every five years, DNPS performs a normal operational test of the isolation condenser in accordance with the plant Technical Requirements Manual. This test adequately challenges the isolation condenser and associated piping to allow inspectors to conduct a VT-2 examination that meets the System Leakage Test requirements of IWD-2500-1 and Code Case N-498-1. However, since this test is only performed once every five years, the requirement to conduct a VT-2 examination once per period cannot be met.

To complete the interval inspection requirements of the isolation condenser and associated piping, normal static conditions (filled greater than or equal to 6 ft per the discussion above) exist under which a VT-2 visual examination can be performed.

Proposed Alternate Examination (as stated):

The Isolation Condenser and associated piping in Test Blocks 2(3)IC01 and 2(3)IC02 will be VT-2 visually examined during the Technical Requirements Manual 5-year operational test. This test will cover two of the three inservice inspection periods. Additionally, Test Block 2(3)IC02 will be VT-2 examined under normal static conditions (filled greater than or equal to 6 ft) during the remaining period in which the normal operational test is not performed. These pressure tests will be performed as alternatives to the periodic and interval testing requirements of IWD-2500-1 and Code Case N-498-1.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

The licensee sought relief from the requirements of paragraph IWD-5222(b) which states that in the case of atmospheric storage tanks, the nominal hydrostatic head, developed with the tank filled to its design capacity, shall be acceptable as the system test pressure. Table IWD-2500-1 requires a system leakage test once each period and a system hydrostatic test once each inspection interval. The licensee indicated that DNPS utilizes Code Case N-498-1 to perform a system leakage test in lieu of the hydrostatic test. Instead of meeting the requirements of IWD-5222(b) and Code Case N-498-1 the licensee proposed to VT-2 examine the Isolation Condenser and associated piping in Test Blocks 2(3)IC01 and 2(3)IC02 during the 5-year operational test required by the plant Technical Requirements Manual. This test will cover two of the three inservice inspection periods. Additionally, Test Block 2(3)IC02 will be VT-2 examined under normal static conditions (filled greater than or equal to 6 ft) during the remaining period in which the normal operational test is not performed.

The staff finds the licensee's reasoning in support of its request for relief acceptable. This finding is based on the following considerations:

- The Isolation Condenser does not have a design level; rather, a design pressure is specified. The licensee has shown that the design pressure of the shell side of the Isolation Condenser is 25 psig. It would be impossible to develop 25 psig of pressure in

the Isolation Condenser shell side because the condenser is vented to the atmosphere through a nonisolable line and the condenser is only 12 feet in height. A hydrostatic head of 25 psig would correspond to approximately 58 feet of water.

- The shell side of the condenser is designed for 25 psig, however the system is normally operated with the Isolation Condenser water at a level greater than or equal to 6 ft.

- The licensee proposed to VT-2 examine the Isolation Condenser and associated piping during the performance of the 5-year operational test required by the plant Technical Requirements Manual. This test will cover two of the three inservice inspection periods.

- Test Block 2(3)IC02 will be VT-2 examined under normal static conditions (filled greater than or equal to 6 feet) during the remaining period in which the normal operational test is not performed.

Conclusions

Based on the information provided in the licensee's submittal, the NRC staff has determined that the licensee has provided an acceptable alternative to the requirements of ASME Code, Section XI, paragraph IWD-5222(b) and Code Case N-498-1. This conclusion is based on the fact that the licensee has proposed to VT-2 examine the Isolation Condenser and associated piping during the performance of the 5-year operational test as required by the plant Technical Requirements Manual. In addition, the licensee will VT-2 examine Test Block 2(3)IC02 under normal static conditions during the remaining period in which the normal operational test is not performed. The performance of these VT-2 examinations will ensure that the structural integrity of the Isolation Condenser and associated piping is adequately verified and maintained during plant operation. The staff, therefore, concludes that the proposed alternative, as described in 14R-06, provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS.

3.7 RELIEF REQUEST 14R-07

The licensee sought relief from the requirements of Table IWC-2500-1 of ASME Section XI to perform visual (VT-2) examination during a system leakage test.

Component Identification (as stated):

Code Class:	2
Reference:	Table IWC-2500-1
Examination Category:	C-H
Item Number:	C7.10, C7.30, C7.50, C7.70
Description:	Continuous Pressure Monitoring of the Control Rod Drive (CRD) System Accumulators

Component Number:

Unit No.	Drawing	Test Block No.
Unit 2	M-34, Sh,2	2RC02
Unit 3	M-365 Sh. 2	3RC02

Code Requirement (as stated):

Table IWC-2500-1 requires a Visual VT-2 examination to be performed during a system leakage test.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives provide an acceptable level of quality and safety.

As required by DNPS Technical Specifications, the CRD System Accumulator pressure must be greater than or equal to 940 psig to be considered operable. The accumulator pressure is continuously monitored by system instrumentation. Since the accumulators are isolated from the source of make up nitrogen, the continuous monitoring of the CRD accumulators functions as a pressure decay type test. Should accumulator pressure fall below 1000 psig, an alarm is received in the control room. The pressure drop for the associated accumulator is then recorded, and the accumulator is recharged in accordance with DNPS procedures. If an accumulator requires charging more than twice in a thirty day period, then a leak check is performed to determine the cause of the pressure loss. When leakage is detected, corrective actions are taken to repair the leaking component as required by DNPS procedures.

Since monitoring the nitrogen side of the accumulators is continuous, any leakage from the accumulator would be detected by normal system instrumentation. An additional Visual VT-2 examination performed once per inspection period would not provide an increase in safety, system reliability, or structural integrity. In addition, performance of a Visual VT-2 would require applying a leak detection solution to 177 accumulators per unit resulting in additional radiation exposure without any added benefit in safety. This inspection would thus not be consistent with ALARA practices.

Relief is requested from the Visual VT-2 examination requirements specified in Table IWC-2500-1 for the nitrogen side of the CRD System Accumulators on the basis that DNPS Technical Specification Surveillance requirements exceed the code requirement for a Visual VT-2 Examination.

Proposed Alternate Provisions (as stated):

As an alternate to the Visual VT-2 examination requirements of Table IWC-2500-1, DNPS will perform continuous pressure decay monitoring in conjunction with Technical Specifications for the nitrogen side of the CRD accumulators including attached piping.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

The licensee sought relief from the requirements of Table IWC-2500-1 of ASME Section XI to perform visual VT-2 examination of the nitrogen side of the CRD System accumulators on the basis that DNPS Technical Specification Surveillance requirements exceed the code requirement for a visual VT-2 examination.

The staff finds the licensee's reasoning in support of its request for relief acceptable. This finding is based on the following considerations: The licensee has stated that the plant Technical Specifications requires that the CRD System accumulator pressure must be greater than or equal to 940 psig to be considered operable. The accumulator pressure is continuously monitored by system instrumentation. Since the accumulators are isolated from the source of make up nitrogen, the continuous monitoring of the CRD accumulators functions as a pressure decay type test. Should accumulator pressure fall below 1000 psig, an alarm is received in the control room. The pressure drop for the associated accumulator is then recorded, and the accumulator is recharged in accordance with DNPS procedures. If an accumulator requires charging more than twice in a thirty-day period, then a leak check is performed to determine the cause of the pressure loss. When leakage is detected, corrective actions are taken to repair the leaking component as required by DNPS procedures. Since monitoring the nitrogen side of the accumulators is continuous, any leakage from the accumulator would be detected by normal system instrumentation. Therefore, the licensee has shown that the DNPS Technical Specification Surveillance requirements exceed the Code requirement to perform VT-2 examination during system leakage test.

Conclusions

Based on the information provided in the licensee's submittal, the NRC staff has determined that the licensee has proposed an acceptable alternative to the requirements specified in Table IWC-2500-1 of ASME Code, Section XI, and that the proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS.

3.8 RELIEF REQUEST 14R-08

The licensee sought relief from the requirements of ASME Code, Section XI, Appendix VIII, Supplement 11. The licensee proposed to use the program developed by the industry's Performance Demonstration Initiative (PDI) in lieu of the requirements of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 11.

Component Identification (as stated):

Code Class:	1
Reference:	ASME Section XI, Appendix VIII, Supplement 11,"Qualification Requirements For Full Structural Overlaid Wrought Austenitic Piping Welds"
Examination Category:	B-J
Item Number:	B9.11
Description:	Pressure Retaining Welds in Piping Subject to Appendix VIII, Supplement 11 (Note: Also Identified in USNRC Generic Letter 88-01 as Category E)
Component Number:	Weld Overlay Components Subject to Ultrasonic Examination

Code Requirement (as stated):

The Code requirements for which relief is requested are all contained within Appendix VIII, Supplement 11. For example, paragraph 1.1(d)(1), requires that all base metal flaws be cracks. Paragraph 1.1(e)(1) requires that at least 20% but less than 40% of the flaws shall be oriented within ±20 degrees of the pipe axial direction. Paragraph 1.1(e)(1) also requires that the rules of IWA-3300 shall be used to determine whether closely spaced flaws should be treated as single or multiple flaws. Paragraph 1.1(e)(2)(a)(1) requires that a base grading unit shall include at least 3 in. of the length of the overlaid weld and the outer 25% of the overlaid weld and base metal on both sides. Paragraph 1.1(e)(2)(a)(3) requires that for unflawed base grading units, at least 1 in. of unflawed overlaid weld and base metal shall exist on either side of the base grading unit. Paragraph 1.1(e)(2)(b)(1) requires that an overlay grading unit shall include the overlay material and the base metal-to-overlay interface of at least 6 sq. in. The overlay grading unit shall be rectangular, with minimum dimensions of 2 in. Paragraph 3.2(b) requires that all extensions of base metal cracking into the overlay material by at least 0.1 in. be reported as being intrusions into the overlay material.

Specific Code requirements for which relief is requested are identified in the right hand column of the attached table.[4]

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives provide an acceptable level of quality and safety. Paragraph 1.1(d)(1), requires that all base metal flaws be cracks. As illustrated below,[4] implanting a crack requires excavation of the base material on at least one side of the flaw. While this may be satisfactory for ferritic materials, it does not produce a usable axial flaw in austenitic materials because the sound beam, which normally passes only through base material, must now travel through weld material on at least one side, producing an unrealistic flaw response. To resolve this issue, the PDI program revised this paragraph to allow use of alternative flaw mechanisms under controlled conditions. For example, alternative flaws shall be limited to when implantation of

[4] The licensee's Tables and Figures attached to the letter of September 6, 2002, are not included in this Safety Evaluation.

cracks precludes obtaining an effective ultrasonic response, flaws shall be semi-elliptical with a tip width of less than or equal to 0.002 inches, and at least 70% of the flaws in the detection and sizing test shall be cracks and the remainder shall be alternative flaws.

Relief is requested to allow closer spacing of flaws provided they don't interfere with detection or discrimination. The existing specimens used to date for qualification to the Tri-party (USNRC/BWROG/EPRI) agreement have a flaw population density greater than allowed by the current Code requirements. These samples have been used successfully for all previous qualifications under the Tri-party agreement program. To facilitate their use and provide continuity from the Tri-party agreement program to Supplement 11, the PDI Program has merged the Tri-party test specimens into their weld overlay program. For example, the requirement for using IWA-3300 for proximity flaw evaluation in paragraph 1.1(e)(1) was excluded, instead indications will be sized based on their individual merits; paragraph 1.1(d)(1) includes the statement that intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the base metal flaws; paragraph 1.1(e)(2)(a)(1) was modified to require that a base metal grading unit include at least 1 in. of the length of the overlaid weld, rather than 3 inches; paragraph 1.1(e)(2)(a)(3) was modified to require sufficient unflawed overlaid weld and base metal to exist on all sides of the grading unit to preclude interfering reflections from adjacent flaws, rather than the 1 in. requirement of Supplement 11; paragraph 1.1(e)(2)(b)(1) was modified to define an overlay fabrication grading unit as including the overlay material and the base metal-to-overlay interface for a length of at least 1 in., rather than the 6 sq. in. requirement of Supplement 11; and paragraph 1.1(e)(2)(b)(2) states that overlay fabrication grading units designed to be unflawed shall be separated by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1 in. at both ends, rather than around its entire perimeter.

Additionally, the requirement for axially oriented overlay fabrication flaws in paragraph 1.1(e)(1) was excluded from the PDI Program as an improbable scenario. Weld overlays are typically applied using automated gas tungsten arc welding techniques with the filler metal being applied in a circumferential direction. Because resultant fabrication induced discontinuities would also be expected to have major dimensions oriented in the circumferential direction axial overlay fabrication flaws are unrealistic.

The PDI Program revised paragraph 2.0 to permit the overlay fabrication flaw test and the base metal flaw tests be performed separately.

The requirement in paragraph 3.2(b) for reporting all extensions of cracking into the overlay is omitted from the PDI Program because it is redundant to the RMS calculations performed in paragraph 3.2(c) and its presence adds confusion and ambiguity to depth sizing as required by paragraph 3.2(c). This also makes the weld overlay program consistent with the Supplement 2 depth sizing criteria.

There are, however, some additional changes that were inadvertently omitted from the Code Case. The most important change is paragraph 1.1(e)(2)(a)(1) where the phrase "and base metal on both sides," was inadvertently included in the description of a base metal grading unit. The PDI program intentionally excludes this requirement because some of the qualification samples include flaws on both sides of the weld. To avoid confusion several instances of the term "cracks" or "cracking" were changed to the term "flaws" because of the use of alternative flaw mechanisms. Additionally, to avoid confusion, the overlay thickness tolerance contained in paragraph 1.1(b) last sentence, was reworded and the phrase "and the remainder shall be

alternative flaws" was added to the next to last sentence in paragraph 1.1(d)(1). These changes are identified by **bold** print in the third column of the attached table.[4]

PDI has submitted these changes as a Code Case and they have been approved, but the Code Case will not be published until later in 2002. A detailed comparison matrix (Table IR-08.1)[4] between Supplement 11, the proposed ASME Section XI Code Case N-654 (provided for information only), and the PDI Program provides supporting documentation. The first column identifies the current requirements in the 95 Edition and 96 Addenda of Supplement 11, while the second (middle) column identifies the changes made by the Code Case.

Proposed Alternate Examination (as stated):

In lieu of the requirements of ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 11, DNPS will use the PDI Program.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

The staff finds the licensee's reasoning in support of its request for relief acceptable. This is based on the fact that the licensee has proposed to use the provisions included in the industry's PDI program. The nuclear power industry tasked PDI with the implementation of a Section XI, Appendix VIII, Supplement 11 performance demonstration program. The PDI program is routinely assessed by the staff for consistency with Code and proposed Code changes. In order to meet the scheduled implementation date of November 22, 2001, specified in 10 CFR 50.55a(g)(6)(ii)(C), PDI evaluated the applicability of using test specimens from an existing weld overlay program[5] for its Supplement 11 performance demonstration program. Their evaluation identified differences with Paragraphs 1.1(e)(1), 1.1(e)(2)(a)(1), 1.1(e)(2)(a)(3), 1.1(e)(2)(b)(1), and 3.2(b). PDI proposed through Code that these paragraphs be changed to permit using the existing weld overlay test specimens.

Paragraph 1.1(e)(1) requires that at least 20% but not less than 40% of the flaws shall be oriented within ± 20 degrees of the axial direction. In the PDI program the flaws satisfy the requirement and specifies that the flaws must be in the base metal. This is a tightening of the requirements. Hence, PDI's application of flaw angles to the axial direction is acceptable.

Paragraph 1.1(e)(1) also requires that the rules of IWA-3300 shall be used to determine whether closely spaced flaws should be treated as single or multiple flaws. PDI treats each flaw as an individual flaw and not as part of a system of closely spaced flaws. PDI controls the flaws going into a test specimen set such that the flaws are free of interfering reflections from adjacent flaws. In some cases this would permit flaws to be closer together than what is

[5] The existing weld overlay program is the industry's response to Generic Letter 88-01 which resulted in a Tri-party Agreement between NRC, EPRI, and the Boiling Water Reactor Owners Group (BWROG), "Coordination Plan for NRC/EPRI/BWROG Training and Qualification Activities of NDE Personnel," July 3, 1984.

allowed by IWA-3300, thus making the performance demonstration more challenging. Hence, PDI's application for closely spaced flaws is acceptable.

Paragraph 1.1(e)(2)(a)(1) requires that a base grading unit shall include at least 3 inches of the length of the overlaid weld, and the base grading unit includes the outer 25% of the overlaid weld and base metal on both sides. The PDI program reduced the criteria to 1 in. of the length of the overlaid weld and eliminated from the grading unit the need to include both sides of the weld. The test specimens from the existing weld overlay program have flaws on both sides of the welds which prevents them from satisfying the base grading unit requirements. These test specimens have been used successfully for testing the proficiency of personnel for over 16-years. This is a more challenging test because the individual must locate the flaw on the correct side of the weld. Hence, PDI's application of the 1 in. length of the overlaid weld base grading unit and elimination from the grading unit the need to include both sides of the weld is acceptable.

Paragraph 1.1(e)(2)(a)(3) requires that for unflawed base grading units, at least 1 in. of unflawed overlaid weld and base metal shall exist on either side of the base grading unit. This is to minimize the number of false identifications of extraneous reflectors. The PDI program stipulates that unflawed overlaid weld and base metal exists on all sides of the grading unit and be free of interfering reflections from adjacent flaws which addresses the same concerns as Code. Hence PDI's application of the variable flaw free area adjacent to the grading unit is acceptable.

Paragraph 1.1(e)(2)(b)(1) requires that an overlay grading unit shall include the overlay material and the base metal-to-overlay interface of at least 6 sq. in. The overlay grading unit shall be rectangular, with minimum dimensions of 2 in. The PDI program reduces the base metal-to-overlay interface to at least 1 in. (in lieu of a minimum of 2 inches) and eliminates the minimum rectangular dimension. This criterion is more challenging than Code because of the variability associated with the shape of the grading unit. Hence, PDI's application of the grading unit is acceptable.

Paragraph 3.2(b) requires that all extensions of base metal cracking into the overlay material by at least 0.1 inch are reported as being intrusions into the overlay material. The PDI program omits this criteria. The PDI program requires that cracks be sized to the tolerance specified in Code which is 0.125 inches. Since the Code tolerance is close to the 0.1 inch value of Paragraph 3.2(b), any crack extending beyond 0.1 inch into the overlay material would be identified from its dimensions. The reporting of an extension in the overlay material is redundant for performance demonstration testing. Hence, PDI's omission of highlighting a crack extending beyond 0.1 inch into the overlay material is acceptable.

In addition to the changes for flaw locations, PDI determined that certain Supplement 11 requirements pertaining to location and size of cracks would be extremely difficult to achieve. In an effort to satisfy the requirements, PDI developed a process for fabricating flaws that exhibited crack like reflective characteristics. Instead of all flaws being cracks as required by Paragraph 1.1(d)(1), the PDI weld overlay performance demonstrations contain at least 70% cracks with the remainder being fabricated flaws exhibiting crack like reflective characteristics. The NRC has reviewed the flaw fabrication process, and has compared the reflective

characteristics between cracks and fabricated flaws. NRC has found the fabricated flaws acceptable for the application.[6, 7]

Based on the above evaluation, the staff has concluded that the proposed alternative to use the EPRI-PDI program requirements in lieu of the ASME Code, Section XI, Appendix VIII, Supplement 11 will provide an acceptable level of quality and safety.

Conclusions

Based on the information provided in the licensee's submittal, the NRC staff has determined that the proposed alternative provides an acceptable level of quality and safety. This is based on the fact that the licensee will conduct qualification of ultrasonic systems for examining weld overlay on pipes using the provisions provided by the PDI program. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS.

3.9 RELIEF REQUEST 14R-09

Component Identification (as stated):

Code Class:	1, 2, and 3
Reference:	IWA-5250(a)(2)
Examination Category:	N/A
Item Number:	N/A
Description:	Alternative Rules for Corrective Measures if Leakage Occurs at Bolted Connections
Component Number:	All Pressure Retaining Bolted Connections

Code Requirements (as stated):

IWA-5250(a)(2) states that if leakage occurs at a bolted connection, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55(a)(3)(i), relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety.

Removal of pressure retaining bolting at mechanical connections for VT-3 visual examination and subsequent evaluation in locations where leakage has been identified is not always the

[6] NRC memorandum, "Summary of Public Meeting Held January 31 - February 2, 2001," with PDI Representatives, March 2, 2001.

[7] NRC memorandum, "Summary of Public Meeting Held June 12 through June 14, 2001," with PDI Representatives, November 29, 2001.

most prudent course of action to determine condition of the bolting and/or the root cause of the leak. The requirement to remove, examine, and evaluate bolting in this situation does not allow consideration of other factors which may indicate the condition of mechanical joint bolting. Other factors which should be considered in an evaluation of bolting condition when leakage has been identified at a mechanical joint include, but are not limited to:

- Bolting material
- Corrosiveness of process fluid
- Service age of joint bolting materials
- Leakage location
- Leakage history at connection
- Visual evidence of corrosion at connection (connection assembled)
- Plant / industry studies of similar bolting materials in a similar environment
- Condition and leakage history of adjacent components

An example at DNPS is the complete replacement of bolting materials (e.g., studs, bolts, nuts, washers, etc.) at mechanical joints during plant outages. In some cases, when the associated system process piping is pressurized during plant start-up, leakage is identified at these joints. The cause of this leakage is often due to thermal expansion of the piping and bolting materials at the joint and subsequent process fluid seepage at the joint gasket. In most of these cases, proper re-torquing of the joint bolting stops the leakage. Removal of any of the joint bolting to evaluate for corrosion would be unwarranted in this situation. ASME Section XI Code Interpretation XI-1-92-01 has recognized that this situation exists, and has clarified that the requirements of IWA-5250(a)(2) do not apply.

Proposed Alternate Provisions (as stated):

DNPS proposes the following alternative, consistent with the methodology of Code Case N-566-2, to the requirements of IWA-5250(a)(2), which will provide an equivalent level of quality and safety when evaluating leakage and bolting material condition at Class 1, 2, and 3 bolted connections.

As an alternative to the to the requirements of IWA-5250(a)(2), one of the following requirements will be met for leakage at bolted connections.

(a) The leakage will be stopped, and the bolting and component material will be reviewed for joint integrity as described in (c) below.

(b) If the leakage is not stopped, the DNPS will evaluate the structural integrity and consequences of continuing operation, and the effect on the system operability of continued leakage. This engineering evaluation will include the considerations listed in (c) below.

(c) The evaluation of (a) and (b) above is to determine the susceptibility of the bolting to corrosion and failure. This evaluation will include the following:

(1) the number and service age of the bolts;
(2) bolt and component material;
(3) corrosiveness of process fluid;
(4) leak location and system function;
(5) leakage history at the connection or other system components;
(6) visual evidence of corrosion at the assembled connection.

If any of the above parameters indicates a need for further examination, corrective action will be taken in accordance with IWA-5250(a)(2).

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

The ASME Code, Section XI, paragraph IWA-5250(a)(2) states that if leakage occurs at a bolted connection, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. Instead of following the requirements of IWA-5250(a)(2) the licensee proposed to use an alternative which follows the methodology of Code Case N-566-2.

The staff finds the licensee's reasoning in support of its request for relief acceptable. This finding is based on the fact that the licensee has proposed to use the methodology of Code Case N-566-2. Although Code Case N-566-2 is not yet approved for use in Regulatory Guide 1.147, "Inservice Code Case Acceptability, ASME Section XI, Division 1," the staff has determined that the Code Case is acceptable. The methodology of Code Case N-566-2 requires that the leakage be stopped, and the bolting and component material be reviewed for joint integrity. If the leakage is not stopped, the licensee will evaluate the structural integrity and consequences of continuing operation, and the effect on the system operability of continued leakage. This evaluation will take into consideration factors such as the number and service age of the bolts, bolt and component material, corrosiveness of process fluid, leak location and system function, leakage history at the connection or other system components, and confirmation of visual evidence of corrosion at the bolted connection. If the evaluation results indicate a need for further examination, corrective action will be taken by the licensee in accordance with the provisions of paragraph IWA-5250(a)(2) of ASME Code Section XI.

Conclusions

Based on the information provided in the licensee's submittal, the NRC staff has determined that the licensee has provided an acceptable alternative to the requirements of ASME Code, Section XI, paragraph IWA-5250(a)(2). This conclusion is based on the fact that the licensee has proposed to use the methodology of Code Case N-566-2. Code Case N-566-2 requires that the leakage be stopped, and the bolting and component material be reviewed for joint integrity. If the leakage is not stopped, the licensee will evaluate the structural integrity and consequences of continuing operation, and the effect on the system operability of continued leakage. If the evaluation results indicates a need for further examination, corrective action will

be taken by the licensee in accordance with the provisions of paragraph IWA-5250(a)(2) of ASME Code Section XI. The staff, therefore, concludes that the proposed alternative, as described in 14R-09, provides an acceptable level of quality and safety, and, is therefore, authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS. Use of the code case is authorized until such time as the code case is published in a future version of RG 1.147. At that time, if the licensee intends to continue implementing this code case, it must follow all provisions of Code Case N-578-1 with limitations or conditions specified in RG 1.147, if any.

3.11 RELIEF REQUEST 14R-11

Component Identification (as stated):

Code Class:	2 and 3
Reference:	IWC-3122.3, IWC-3132.3, IWC-3600, IWD-3000
Examination Category:	N/A
Item Number:	N/A
Description:	Evaluation Criteria for Temporary Acceptance of Flaws
Component Number:	Moderate Energy Class 2 and 3 Piping

Code Requirements (as stated):

IWC-3122.3 states that a component whose volumetric or surface examination detects flaws may be acceptable for continued service without a repair/replacement activity if an analytical evaluation is performed in accordance with IWC-3600. Similar requirements for visual examinations are contained in IWC-3132.3.

In the 1995 Edition with the 1996 Addenda of ASME Section XI, IWC-3600, Analytical Evaluation of Flaws, and IWD-3000, Acceptance Standards, are in the course of preparation and state that the requirements of IWB may be used.

Basis for Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

ASME Section XI Code Case N-513 is conditionally approved for use in Revision 13 of Regulatory Guide 1.147; however, this Case is not applicable to the 1996 Addenda which is DNPS's code of record for the fourth inspection interval. Code Case N-513-1 has since been issued in Supplement 11 of the 1998 Edition and is currently applicable through the 2001 Edition. This revision of the Code Case is not yet approved for use by the USNRC.

Code Case N-513-1 revises the base case to expand the temporary acceptance methodology from Class 3 moderate energy piping to Class 2 and 3 moderate energy piping. Both cases provide requirements which may be followed for temporary acceptance of flaws in ASME Section III, ANSI B31.1, and ANSI B31.7 piping designated as Class 2 or 3. This acceptance is limited to moderate energy piping defined as piping whose maximum operating temperature does not exceed 200°F and whose maximum operating pressure does not exceed 275 psig. The provisions of the case demonstrate the integrity of the item containing the flaw for a limited

period of time until appropriate repair/replacement or additional examination activities can be performed.

Proposed Alternate Provisions (as stated):

When using analytical evaluation as the method of acceptance for flaws in moderate energy Class 2 or 3 piping, DNPS will follow the provisions of Code Case N-513-1 without performing a repair/replacement activity. This acceptance will be temporary and will remain in affect for a limited time, not exceeding the time to the next scheduled outage.

DNPS may implement this method or one of the other methods contained in ASME Section XI to accept detected flaws; however, in no case will the temporary evaluation process be applied to:

(a) components other than pipe or tube,
(b) leakage through a gasket,
(c) threaded connections with nonstructural seal welds for leakage prevention, or
(d) degraded socket welds.

When applying the methods of Code Case N-513-1, the specific safety factors contained in Paragraph 4.0 of the Case will be satisfied. These conditions are consistent with those contained in 10 CFR 50.55a(b)(2)(xiii) regarding the use of Code Case N-513.

Applicable Time Period (as stated):

Relief is requested for the fourth ten-year inspection interval of the Inservice Inspection Program for DNPS Units 2 and 3.

Staff Evaluation

By letter dated September 6, 2002, Exelon Generating Company, LLC (Exelon, the licensee), sought relief from the requirements of IWC-3122.3 which states that a component whose volumetric or surface examination detects flaws may be acceptable for continued service without a repair/replacement activity if an analytical evaluation is performed in accordance with IWC-3600. As an alternative, the licensee proposed to use the provisions of Code Case N-513-1 to evaluate the acceptability of flaws without performing a repair/replacement activity. This acceptance will be temporary and will remain in affect for a limited time, not exceeding the time to the next scheduled outage. The proposed relief is sought for the fourth ten-year ISI interval. The DNPS fourth ten-year ISI program plan meets the requirements of ASME Code, Section XI, 1995 Edition with 1996 Addenda.

The staff finds the licensee's reasoning in support of its request for relief acceptable. This finding is based on the following considerations:

- ASME Section XI Code Case N-513 is conditionally approved for use in Revision 13 of the NRC Regulatory Guide 1.147. The licensee's proposed alternative satisfies the conditions stated in Revision 13 to Regulatory Guide 1.147 for Code Case N-513.

- Code Case N-513-1 expands the temporary acceptance methodology from Class 3 moderate energy piping to Class 2 and 3 moderate energy piping. Both cases provide

requirements which may be followed for temporary acceptance of flaws in ASME Section III, ANSI B31.1, and ANSI B31.7 piping designated as Class 2 or 3. The conditions stated in Revision 13 to Regulatory Guide 1.147 for Case N-513 apply also for Case N-513-1. Since the issuance of Revision 13 to Regulatory Guide 1.147 the staff has determined that the analytical procedures specified in Case N-513 to evaluate degraded Class 3 piping can be applied to Class 2 moderate energy piping for limited duration, not exceeding the time to the next scheduled outage.

- Both Cases apply only to moderate energy piping defined as piping whose maximum operating temperature does not exceed 200 °F and whose maximum operating pressure does not exceed 275 psig.

- The provisions of both Cases provides for demonstration of structural integrity of an item containing flaws for a limited period of time until appropriate repair/replacement can be performed.

Conclusion

Based on the information provided in the licensee's submittal, the NRC staff has determined that the proposed alternative, as described in 14R-11, provides an acceptable level of quality and safety. This is based on the fact that the licensee will use the provisions specified in ASME Code Case N-513-1. The staff has determined that the analytical procedures specified in Code Case N-513 can be used to evaluate the structural integrity of degraded Class 2 and Class 3 moderate energy piping for limited duration, not exceeding the time to the next scheduled outage. The staff had conditionally approved Code Case N-513 for use in Revision 13 of the NRC Regulatory Guide 1.147. The licensee's proposed alternative satisfies the conditions stated in Revision 13 to Regulatory Guide 1.147. The staff, therefore concludes that the licensee has proposed an acceptable alternative to the requirements of ASME Code Section XI and, therefore, request for relief 14R-11 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI intervals at DNPS. Use of the Code Case N-513-1 is authorized until such time as the code case is published in a future version of RG 1.147. At that time, if the licensee intends to continue implementing this code case, it must follow all provisions of Code Case N-513-1 with limitations or conditions specified in RG 1.147, if any.

4.0 CONCLUSION SUMMARY

Based on the above evaluation, for the fourth 10-year ISI interval of Dresden Units 2 and 3 scheduled to commence on January 20, 2003, and end by January 19, 2013, the staff concludes that:

1) for relief request RR-14R-01, the proposed alternatives would provide reasonable assurance of the structural integrity and compliance with the specified Code requirements would result in hardship without a compensating increase in the level of quality and safety; therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2) for relief request RR-14R-05, compliance with the specified Code requirements is impractical and that proposed alternatives contained in the request for relief would provide reasonable assurance of structural integrity; therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(g)(6)(i). Granting relief pursuant to 10 CFR

50.55a(g)(6)(i) 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.

3) for relief requests RR-14R-02, 03, 04, 06, 07, 08, 09, and 11, the proposed alternatives would provide an acceptable level of quality and safety; therefore, the proposed alternatives contained in the request for relief are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: G. Georgiev, EMCB/DE/NRR
S. Dinsmore, SPSB/DSSA/NRR

Date: September 4, 2003