Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

Exelon Nuclear

10 CFR 50.55a

March 13, 2009
RS-09-044

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Dresden Nuclear Power Station, Units 2 and 3
Renewed Facility Operating Licenses Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Subject: Request for Alternative to Nozzle-to-Vessel Weld and Inner Radius Examinations

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (a)(3)(i), Exelon Generation Company, LLC (EGC) is requesting relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," (ASME Section XI).

Specifically, EGC requests NRC approval to implement an alternative from ASME Section XI, Table IWB-2500-1, "Examination Category B-D, Full Penetration Welded Nozzle in Vessels - Inspection Program B," to allow reduced percentage requirements for Nozzle-to-Vessel Weld and Inner Radius Examinations at Dresden Nuclear Power Station (DNPS), Units 2 and 3. This requested relief is consistent with ASME Code Case N-702, "Alternative Requirements for Boiling Water Reactor Nozzle Inner Radius and Nozzle-to-Shell Welds." EGC is requesting this relief for the remainder of the fourth ten-year interval of the DNPS Inservice Inspection Program, which began on January 20, 2003.

The NRC has recently approved a similar request to adopt an alternative to ASME Section XI, Table IWB-2500-1 to allow reduced percentage requirements for Nozzle-to-Vessel Weld and Inner Radius Examinations for the Duane Arnold Energy Center. This approval is documented in ADAMS Accession Number ML082040046.

The request is described in the attachment to this letter. EGC requests approval of this request by March 13, 2010.

There are no regulatory commitments contained within this letter. If there are any questions or comments, please contact Ms. Michelle Yun at (630) 657-2818.

Respectfully,

Jeffrey L. Hansen
Manager - Licensing

Attachment: Dresden Nuclear Power Station, Units 2 and 3, Relief Request I4R-16
Enclosure 1: Relief Request I4R-16, Applicable Nozzles
Enclosure 2: Relief Request I4R-16, Plant Specific Applicability

Attachment

Dresden Nuclear Power Station, Units 2 & 3

Relief Request I4R-16

Attachment
Relief Request Number: I4R-16

Proposed Alternative In Accordance with 10 CFR 50.55a(a)(3)(i)
Which Provides an Acceptable Level of Quality or Safety

1.0 ASME Code Component(s) Affected

Code Class:	1
Component Numbers:	N2, N3, N8, N18, N19 and N20 Nozzles (See Enclosure 1 for complete list of nozzle identifications)
Examination Category:	B-D (Inspection Program B)
Item Number:	B3.90 and B3.100
Description:	Alternative to ASME Section XI, Table IWB-2500-1

2.0 Applicable Code Edition and Addenda

Dresden Nuclear Power Station (DNPS) is currently in the fourth 10-year Inservice Inspection (ISI) Program interval and is committed to American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," (ASME Section XI), 1995 Edition through 1996 Addenda. Additionally, for ultrasonic examinations, ASME Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 Edition through 1996 Addenda is implemented, as required and modified by 10 CFR 50.55a(b)(2)(xv).

3.0 Applicable Code Requirement

Table IWB-2500-1, "Examination Category B-D, Full Penetration Welded Nozzle in Vessels - Inspection Program B"

Class 1 nozzle-to-vessel weld and nozzle inner radii examination requirements are delineated in Item Number B3.90, "Nozzle-to-Vessel Welds," and B3.100, "Nozzle Inside Radius Section." The required method of examination is volumetric. All nozzles with full penetration welds to the vessel shell (or head) and integrally cast nozzles are examined each interval.

All of the nozzle assemblies identified in Enclosure 1 are full penetration welds.

4.0 Reason for Request

Enclosure 1 provides a complete listing of the applicable Reactor Pressure Vessel (RPV) nozzles.

The proposed alternative provides an acceptable level of quality and safety, and the reduction in scope could provide a dose savings of as much as 7 Person-Rem for Unit 2 and 8 Person-Rem for Unit 3 over the remainder of the interval.

5.0 Proposed Alternative and Basis for Use

In accordance with 10 CFR 50.55a(a)(3)(i), relief is requested from performing the required examinations on 100 percent of the nozzle assemblies identified in Tables 5-1 and 5-2 below (see Enclosure 1 for complete list of RPV Nozzles). As an alternative for all welds and inner radii identified in Tables 5-1 and 5-2, EGC proposes to examine a minimum of 25 percent of the DNPS, Unit 2 and Unit 3, nozzle-to-vessel welds and inner radius sections, including at least one nozzle from each system and nominal pipe size, in accordance with Code Case N-702. For the nozzle assemblies identified in Enclosure 1, this would mean one from each of the groups identified below:

Table 5-1
DNPS, Unit 2 Summary

Group	Total Number	Minimum Number to be Examined	Comments
Recirculation Inlet (N2)	10	3	Five completed: three in 2003 during D2R18, two in 2007 during D2R20.
Main Steam (N3)	4	1	None completed.
Core Spray (N19)	2	1	Two completed: one in 2003 during D2R18 and one in 2007 during D2R20.
Nozzles on Vessel Top Head (N8, N18)	3	1	None completed.
Jet Pump (N20)	2	1	One completed during 2005 during D2R19.

Therefore, two nozzles remain to be inspected for the remainder of the interval for DNPS, Unit 2: one Nozzle on Vessel Top Head (N8, N18) nozzle and one Main Steam (N3) nozzle.

Table 5-2
DNPS, Unit 3 Summary

Group	Total Number	Minimum Number to be Examined	Comments
Recirculation Inlet (N2)	10	3	Four completed: two in 2004 during D3R18, Two in 2008 during D3R20.
Main Steam (N3)	4	1	Two completed: one in 2004 during D3R18 and one in 2006 during D3R19.
Core Spray (N19)	2	1	Two completed: one in 2004 during D3R18 and one in 2008 during D3R20.
Nozzles on Vessel Top Head (N8, N18)	3	1	Three completed in 2006 and 2008.
Jet Pump (N20)	2	1	None completed.

Therefore, one nozzle remains to be inspected for the remainder of the interval for DNPS, Unit 3: one Jet Pump (N20) nozzle.

Code Case N-702 stipulates that a VT-1 examination may be used in lieu of the volumetric examination for the inner radii (i.e., Item No. B3.100, "Nozzle Inside Radius Section"). EGC is not currently using Code Case N-648-1 at DNPS for the identified components on enhanced magnification visual examination and has no plans of using Code Case N-648-1 on those components in the future. Volumetric examinations of all nozzle inside radius section will be completed.

Electric Power Research Institute (EPRI) Technical Report 1003557, "BWRVIP-108: Boiling Water Reactor Vessel and Internals Project Technical Basis for the Reduction of Inspection Requirements for the Boiling Water Reactor Nozzle-to-Vessel Shell Welds and Nozzle Blend Radii," provides the basis for Code Case N-702. The evaluation found that failure probabilities at the nozzle blend radius region and nozzle-to-vessel shell weld due to a Low Temperature Overpressure event are very low (i.e., $<1 \times 10^{-6}$ for 40 years) with or without inservice inspection. The report concludes that inspection of 25 percent of each nozzle type is technically justified.

This EPRI report was approved by the NRC in a safety evaluation (SE)dated December 19, 2007 (i.e., ADAMS Accession No. ML073600374). Section 5.0, "Plant Specific Applicability," of the SE indicates that each licensee who plans to request relief from the ASME Code, Section XI requirements for RPV nozzle-to-vessel shell welds and nozzle inner radius sections may reference the BWRVIP-108 report as the technical basis for the use of ASME Code Case N-702 as an alternative. However, each licensee should demonstrate the plant specific applicability criteria from the

BWRVIP-108 report to its units in the relief request by showing that all the general and nozzle-specific criteria addressed below are satisfied (i.e., as described in Enclosure 2).

(1) The maximum RPV heatup/cooldown rate is limited to less than 115 °F per hour.

DNPS Technical Specification (TS) 3.4.9,"RCS Pressure and Temperature (P/T) Limits," provides a limiting condition for operation (LCO). The heatup/cooldown rate is referenced in the DNPS operating procedures where applicable such as scrams and start-ups. This heatup/cooldown rate is also described in the DNPS Updated Final Safety Analysis Report (UFSAR), Section 5.3.2, "Pressure-Temperature Limits," and UFSAR Table 5.1-1, "Reactor Coolant System Data."

(2) For the Recirculation Inlet Nozzles, the following criteria must be met:

a. $(pr/t)/C_{RPV}<1.15$; The calculation for the DNPS N2 Nozzle results in 1.065, which is less than 1.15

b. $[p(r_o^2+r_i^2)/(r_o^2-r_i^2)]/C_{NOZZLE}<1.15$; The calculation for the DNPS N2 Nozzle results in 0.972, which is less than 1.15.

(3) For the Recirculation Outlet Nozzles, the following criteria must be met:

a. $(pr/t)/C_{RPV}< 1.15$; The calculation for the DNPS N1 Nozzle results in 1.273, which is higher than 1.15.

b. $[p(r_o^2+r_i^2)/(r_o^2-r_i^2)]/C_{NOZZLE}<1.15$; The calculation for the DNPS N1 Nozzle results in 0.840, which is less than 1.15.

Based upon the above information, all DNPS RPV nozzle-to-vessel shell full penetration welds and nozzle inner radii sections, with the exception of the Recirculation Outlet Nozzles, meet the general and nozzle-specific criteria in BWRVIP-108. Therefore, Code Case N-702 is applicable.

Therefore, use of Code Case N-702 provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i) for all RPV nozzle-to-vessel shell full penetration welds and nozzle inner radii sections, with the exception of the Recirculation Outlet Nozzles.

6.0 Duration of Proposed Alternative

The proposed alternative will be used for the remainder of the fourth 10-year interval of the DNPS ISI Program.

7.0 Precedents

The NRC has recently approved a similar request for the Duane Arnold Energy Center. This approval is documented in ADAMS Accession Number ML082040046.

Enclosure 1
Relief Request Number I4R-16
Applicable Nozzles

Unit 2 Applicable Nozzles

Component ID	Category Number	Item Number	System	Nominal Pipe Size	Comments
N2A Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2007
N2A IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2007
N2B Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2007
N2B IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2007
N2C Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2003
N2C IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2003
N2D Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2D IRS	B-D	B3.100	Recirc Inlet	12"	
N2E Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2E IRS	B-D	B3.100	Recirc Inlet	12"	
N2F Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2003
N2F IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2003
N2G Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2G IRS	B-D	B3.100	Recirc Inlet	12"	
N2H Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2003
N2H IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2003
N2J Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2J IRS	B-D	B3.100	Recirc Inlet	12"	
N2K Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2K IRS	B-D	B3.100	Recirc Inlet	12"	
N2L Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2L IRS	B-D	B3.100	Recirc Inlet	12"	
N3A Nozzle	B-D	B3.90	Main Steam	20"	
N3A IRS	B-D	B3.100	Main Steam	20"	
N3B Nozzle	B-D	B3.90	Main Steam	20"	
N3B IRS	B-D	B3.100	Main Steam	20"	
N3C Nozzle	B-D	B3.90	Main Steam	20"	
N3C IRS	B-D	B3.100	Main Steam	20"	
N3D Nozzle	B-D	B3.90	Main Steam	20"	
N3D IRS	B-D	B3.100	Main Steam	20"	
N8 Nozzle	B-D	B3.90	Head Vent	4"	
N8 IRS	B-D	B3.100	Head Vent	4"	
N18A Nozzle	B-D	B3.90	Head Spray	6"	
N18A IRS	B-D	B3.100	Head Spray	6"	
N18B Nozzle	B-D	B3.90	Head Spray Spare	6"	
N18B IRS	B-D	B3.100	Head Spray Spare	6"	
N19A Nozzle	B-D	B3.90	Core Spray	10"	PDI Exam 2007
N19A IRS	B-D	B3.100	Core Spray	10"	PDI Exam 2007
N19B Nozzle	B-D	B3.90	Core Spray	10"	PDI Exam 2003
N19B IRS	B-D	B3.100	Core Spray	10"	PDI Exam 2003
N20A Nozzle	B-D	B3.90	Jet Pump Instrumentation	4"	PDI Exam 2005
N20A IRS	B-D	B3.100	Jet Pump Instrumentation	4"	PDI Exam 2005
N20B Nozzle	B-D	B3.90	Jet Pump Instrumentation	4"	
N20B IRS	B-D	B3.100	Jet Pump Instrumentation	4"	

Enclosure 1
Relief Request Number I4R-16
Applicable Nozzles

Unit 3 Applicable Nozzles

Component ID	Category Number	Item Number	System	Nominal Pipe Size	Comments
N2A Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2A IRS	B-D	B3.100	Recirc Inlet	12"	
N2B Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2008
N2B IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2008
N2C Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2C IRS	B-D	B3.100	Recirc Inlet	12"	
N2D Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2004
N2D IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2004
N2E Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2004
N2E IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2004
N2F Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2F IRS	B-D	B3.100	Recirc Inlet	12"	
N2G Nozzle	B-D	B3.90	Recirc Inlet	12"	PDI Exam 2008
N2G IRS	B-D	B3.100	Recirc Inlet	12"	PDI Exam 2008
N2H Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2H IRS	B-D	B3.100	Recirc Inlet	12"	
N2J Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2J IRS	B-D	B3.100	Recirc Inlet	12"	
N2K Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2K IRS	B-D	B3.100	Recirc Inlet	12"	
N2L Nozzle	B-D	B3.90	Recirc Inlet	12"	
N2L IRS	B-D	B3.100	Recirc Inlet	12"	
N3A Nozzle	B-D	B3.90	Main Steam	20"	
N3A IRS	B-D	B3.100	Main Steam	20"	
N3B Nozzle	B-D	B3.90	Main Steam	20"	
N3B IRS	B-D	B3.100	Main Steam	20"	
N3C Nozzle	B-D	B3.90	Main Steam	20"	PDI Exam 2004
N3C IRS	B-D	B3.100	Main Steam	20"	PDI Exam 2004
N3D Nozzle	B-D	B3.90	Main Steam	20"	PDI Exam 2006
N3D IRS	B-D	B3.100	Main Steam	20"	PDI Exam 2006
N8 Nozzle	B-D	B3.90	Head Vent	4"	PDI Exam 2006
N8 IRS	B-D	B3.100	Head Vent	4"	PDI Exam 2008
N18A Nozzle	B-D	B3.90	Head Spray	6"	PDI Exam 2006
N18A IRS	B-D	B3.100	Head Spray	6"	PDI Exam 2008
N18B Nozzle	B-D	B3.90	Head Spray Spare	6"	PDI Exam 2006
N18B IRS	B-D	B3.100	Head Spray Spare	6"	PDI Exam 2008
N19A Nozzle	B-D	B3.90	Core Spray	10"	PDI Exam 2008
N19A IRS	B-D	B3.100	Core Spray	10"	PDI Exam 2008
N19B Nozzle	B-D	B3.90	Core Spray	10"	PDI Exam 2004
N19B IRS	B-D	B3.100	Core Spray	10"	PDI Exam 2004
N20A Nozzle	B-D	B3.90	Jet Pump Instrumentation	4"	
N20A IRS	B-D	B3.100	Jet Pump Instrumentation	4"	
N20B Nozzle	B-D	B3.90	Jet Pump Instrumentation	4"	
N20B IRS	B-D	B3.100	Jet Pump Instrumentation	4"	

Enclosure 2
Relief Request Number I4R-16

Plant Specific Applicability

(1) The maximum Reactor Pressure Vessel (RPV) heatup/cooldown rate is limited to less than 115 °F/hour.

Response: DNPS Technical Specification (TS) 3.4.9,"RCS Pressure and Temperature (P/T) Limits," provides a limiting condition for operation (LCO). The heatup/cooldown rate is referenced in the Dresden operating procedures where applicable such as scrams and start-ups. This heatup/cooldown rate is also described in the DNPS Updated Final Safety Analysis Report (UFSAR) Section 5.3.2, "Pressure-Temperature Limits," and UFSAR Table 5.1-1, "Reactor Coolant System Data."

For Recirculation Inlet Nozzles

(2) $(pr/t)/C_{RPV} < 1.15$

$p=RPV_{\text{Normal Operating Pressure}}$	1005
$r=RPV_{\text{inner radius}}$	125.5
$t=RPV_{\text{wall thickness}}$	6.125
$C_{RPV}=$	19332

$(pr/t)/C_{RPV} = 1.065 < 1.15$

(3) $[p(r_o^2 + r_i^2)/(r_o^2 - r_i^2)]/C_{NOZZLE} < 1.15$

$p=RPV_{\text{Normal Operating Pressure}}$	1005
$r_o=$ nozzle outer radius	12.5
$r_i=$ nozzle inner radius	5.941
C_{NOZZLE}	1637

$[p(r_o^2 + r_i^2)/(r_o^2 - r_i^2)]/C_{NOZZLE} = 0.972 < 1.15$

For Recirculation Outlet Nozzles

(4) $(pr/t)/C_{RPV} < 1.15$

$p=RPV_{\text{Normal Operating Pressure}}$	1005
$r=RPV_{\text{inner radius}}$	125.5
$t=RPV_{\text{wall thickness}}$	6.125
$C_{RPV}=$	16171

$(pr/t)/C_{RPV} = 1.273 > 1.15$

(5) $[p(r_o^2 + r_i^2)/(r_o^2 - r_i^2)]/C_{NOZZLE} < 1.15$

$p=RPV_{\text{Normal Operating Pressure}}$	1005
$r_o=$ nozzle outer radius	26.5
$r_i=$ nozzle inner radius	13.1375
C_{NOZZLE}	1977

$[p(r_o^2 + r_i^2)/(r_o^2 - r_i^2)]/C_{NOZZLE} = 0.840 < 1.15$