UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 1, 2010

Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
P.O. Box 250
Governor Hunt Road
Vernon, VT 05354

SUBJECT: RELIEF REQUEST VY-ISI-014, ALTERNATIVE EXAMINATION REQUIREMENTS FOR NOZZLE-TO-VESSEL WELD AND INNER RADIUS USING ASME CODE CASE N-702 - VERMONT YANKEE NUCLEAR POWER STATION (TAC NO. ME2909)

Dear Sir or Madam:

By letter dated December 14, 2009 (Agencywide Documents Access and Management System, (ADAMS), Accession No. ML093520390), as supplemented by letter dated July 1, 2010 (ML101880273), Entergy Nuclear Operations, Inc. (the licensee) submitted Relief Request VY-ISI-014, for the fourth 10-year interval inservice inspection (ISI) program at Vermont Yankee Nuclear Power Station (Vermont Yankee). Relief Request VY-ISI-014 proposed an alternative to the ISI requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, in order to implement the alternative inspection requirements specified in ASME Code Case (CC) N-702, "Alternative Requirements for Boiling Water Reactor (BWR) Nozzle Inner Radius and Nozzle-to-Shell Welds, Section XI, Division 1," for the specified ASME Code Class 1, Examination Category B-D, Item Nos. B3.90 and B3.100 reactor vessel (RV) nozzle-to-vessel shell weld and nozzle inner radius section components.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

The Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittal and concludes that that the licensee's proposed alternative for the subject RV nozzles described in VY-ISI-014 will provide an acceptable level of quality and safety. Therefore, Relief Request VY-ISI-014 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year interval ISI program at Vermont Yankee, and the licensee may implement ASME Code Case N-702 for inspections of the subject ASME Code Class 1, Examination Category B-D RV nozzle components.

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

If you have any questions regarding this approval, please contact the Vermont Yankee Project Manager, James Kim, at 301-415-4125.

Sincerely,

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

Docket No. 50-271

Enclosure:
As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST VY-ISI-014

ENTERGY NUCLEAR OPERATIONS, INC.

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

By letter dated December 14, 2009 (Agencywide Documents Access and Management System, (ADAMS), Accession No. ML093520390), as supplemented by letter dated July 1, 2010 (ML101880273), Entergy Nuclear Operations, Inc. (the licensee) submitted Relief Request VY-ISI-014, for the fourth 10-year interval inservice inspection (ISI) program at Vermont Yankee Nuclear Power Station (Vermont Yankee). Relief Request VY-ISI-014 proposed an alternative to the ISI requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, in order to implement the alternative inspection requirements specified in ASME Code Case (CC) N-702, "Alternative Requirements for Boiling Water Reactor (BWR) Nozzle Inner Radius and Nozzle-to-Shell Welds, Section XI, Division 1," for the specified ASME Code Class 1, Examination Category B-D, Item Nos. B3.90 and B3.100 reactor vessel (RV) nozzle-to-vessel shell weld and nozzle inner radius section components. The Nuclear Regulatory Commission (NRC) staff reviewed the licensee's request pursuant to the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR), Paragraph 50.55a(a)(3)(i).

2.0 REGULATORY EVALUATION

2.1 Requirements for Inservice Inspection

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

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 pre-service 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 regulation requires that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable Code of record for the the fourth 10-year interval ISI program at Vermont Yankee is the 1998 Edition of the ASME Code, Section XI, with 2000 Addenda. The fourth 10-year interval ISI program at Vermont Yankee began in September 2003, and is scheduled to end in August 2013.

2.2 Applicable ASME Code, Section XI Requirements and ASME Code Case N-702 Alternative Requirements

ISI of ASME Code Class 1 components consists of volumetric examinations, surface examinations, and/or visual examinations to detect flaws in RV, RV attachment, core support structure, and reactor coolant pressure boundary (RCPB) components. The 1998 Edition and 2000 Addenda of the ASME Code, Section XI, Article IWB-2500 requires that ASME Code Class 1 components be examined and tested as specified in Table IWB-2500-1 of the ASME Code, Section XI. Table IWB-2500-1, Examination Category B-D, Full Penetration Welded Nozzles in Vessels – Inspection Program B, Item Nos. B3.90 and B3.100 define the examination requirements for the RV nozzle-to-vessel welds and RV nozzle inside radius sections, respectively.

The ASME Code, Section XI requires volumetric examinations of 100 percent of the RV nozzle-to-vessel welds (Examination Category B-D, Item No. B3.90) and nozzle inside radius sections (Examination Category B-D, Item No. B3.100) during each 10-year ISI interval. However, ASME Code Case (CC) N-702, "Alternative Requirements for Boiling Water Reactor (BWR) Nozzle Inner Radius and Nozzle-to-Shell Welds, Section XI, Division 1," provides for an alternative which would allow for a reduction in the inspection sample size for the RV nozzle-to-vessel shell welds and nozzle inside radius sections from 100 percent to a minimum of 25 percent of the nozzles for each nozzle type during each 10-year ISI interval. ASME CC N-702 specifically excludes the BWR feedwater nozzles and control rod drive return line nozzles from the application of the reduced sample size. The Boiling Water Reactor Vessel and Internals Project (BWRVIP) Report, BWRVIP-108, "BWR Vessel and Internals Project, Technical Basis for the Reduction of Inspection Requirements for the Boiling Water Reactor Nozzle-to-Vessel Shell Welds and Nozzle Inner Radius (BWRVIP-108)," October 2002, as supplemented by BWRVIP letters dated July 25, 2006, and September 13, 2007, provides the underlying technical bases for implementation of ASME CC N-702 based on the computation of acceptable failure probabilities for RV nozzles using a probabilistic fracture mechanics (PFM) analysis.

While ASME CC N-702 is not currently approved by the NRC staff for generic implementation by licensees in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 15, October 2007, the NRC issued a Safety Evaluation (SE) dated December 19, 2007 (ML073600374), wherein the NRC staff concluded that the BWRVIP-108 Report (as supplemented) was acceptable for licensee referencing as the technical basis for requests for alternatives under 10 CFR 50.55a(a)(3)(i) to implement the provisions of ASME CC N-702 on a plant-specific basis, provided that licensees demonstrate that their nozzle crack growth criteria are bounded by the criteria established in the BWRVIP-108 SE. The December 19, 2007, SE regarding BWRVIP-108 specified the following plant-specific criteria that must be satisfied by licensees who submit requests for alternatives under 10 CFR 50.55a(a)(3)(1) that

reference the BWRVIP-108 Report as the technical basis for implementation of the provisions ASME CC N-702:

(1) The maximum RV heat-up/cool-down rate shall be limited to less than 115 °F per hour:

Recirculation inlet nozzles

(2) RV Pressure Stress Factor:

$(pr/t)/C_{RPV} < 1.15$, where p = normal RV operating pressure, r = RV inner radius, t = RV wall thickness, and C_{RPV} = 19332 psi (as specified in the NRC staff's SE for BWRVIP-108):

(3) Recirculation Inlet Nozzle Stress Factor:

$[p(r_o^2 + r_i^2)/ (r_o^2 - r_i^2)]/C_{NOZZLE} < 1.15$, where p = normal RV operating pressure, r_o = recirculation inlet nozzle outer radius, r_i = nozzle inner radius, and C_{NOZZLE} = 1637 psi (as specified in the NRC staff's SE for BWRVIP-108):

Recirculation outlet nozzles

(4) RV Pressure Stress Factor:

$(pr/t)/C_{RPV} < 1.15$, where p = normal RV operating pressure, r = RV inner radius, t = RV wall thickness, and C_{RPV} = 16171 psi (as specified in the NRC staff's SE for BWRVIP-108):

(5) Recirculation Outlet Nozzle Stress Factor:

$[p(r_o^2 + r_i^2)/ (r_o^2 - r_i^2)]/C_{NOZZLE} < 1.15$, where p = normal RV operating pressure, r_o = recirculation outlet nozzle outer radius, r_i = nozzle inner radius, and C_{NOZZLE} = 1977 psi (as specified in the NRC staff's SE for BWRVIP-108):

The NRC staff requires that the above criteria be satisfied on a plant-specific basis in requests to implement ASME CC N-702, to ensure that the PFM analysis documented in the BWRVIP-108 Report is applicable to licensees' RVs.

3.0 TECHNICAL EVALUATION

3.1 Component Identification

VY-ISI-014 addresses the following ASME Code, Section XI, Class 1, Examination Category B-D components (the subject components) for the fourth 10-year interval ISI program at Vermont Yankee.

ASME Code Class	Examination Category	Item Numbers	Component Description	Total Number of Components	Minimum Number to be Examined*
1	B-D	B3.90 & B3.100	Recirculation Outlet Nozzles (N1)	2	1
1	B-D	B3.90 & B3.100	Recirculation Inlet Nozzles (N2)	10	3
1	B-D	B3.90 & B3.100	Main Steam Nozzles (N3)	4	1
1	B-D	B3.90 & B3.100	Feedwater Nozzles (N4)**	4	4
1	B-D	B3.90 & B3.100	Core Spray Nozzles (N5)	2	1
1	B-D	B3.90 & B3.100	Instrument Nozzles (N6)	2	1
1	B-D	B3.90 & B3.100	Head Vent Nozzle (N7)	1	1
1	B-D	B3.90 & B3.100	Jet Pump Instrument Nozzles (N8)	2	1
1	B-D	B3.90 & B3.100	Control Rod Drive Return Line Nozzle (N9)**	1	1
1	B-D	B3.90 & B3.100	Standby Liquid Control & Core DP Nozzle (N10)	1	1

* The licensee proposed to implement the alternative requirements of ASME CC N-702 for only the components listed above. The implementation of CC N-702, if authorized, would result in the minimum number of components being examined during the fourth 10-year interval ISI program, as specified above.

** ASME CC N-702 specifically excludes the BWR feedwater nozzles and control rod drive return line nozzle from the application of the reduced sample size specified in the CC. As shown above, the licensee intends to inspect all feedwater nozzles and the control rod drive return line nozzle in accordance with ASME Code, Section XI, Table IWB-2500-1 requirements.

3.2 Licensee's Proposed Alternative and Basis for Use (as stated)

Pursuant to 10 CFR 50.55a(a)(3)(i), an alternative is requested from performing the required examinations on 100% of the identified nozzle assemblies [...]. As an alternative, incorporation of [ASME] Code Case N-702 [...] would require examination of a minimum of 25% of the nozzle-to-vessel welds and inner radius sections, including at least one nozzle from each system and nominal pipe size. For each of the identified nozzle assembles in Table 1 [shown above], both the

> inner radius and the nozzle-to-shell weld would be examined. Six (6) nozzle assemblies remain to be inspected for the remainder of the [fourth 10-year ISI] interval.
>
> Electric Power Research Institute (EPRI) Technical Report 1003557, "BWR Vessel and Internal Project (BWRVIP), Technical Basis for the reduction of Inspection Requirements for the Boiling Water Reactor Nozzle-to-Vessel Shell Welds and Nozzle Blend Radii," [the BWRVIP-108 Report] provides the basis for [ASME] Code Case N-702. The evaluation found that failure probabilities due to a Low Temperature Overpressure event at the nozzle blend radius region and nozzle-to-vessel shell weld are very low (i.e., $< 1 \times 10^{-6}$ over 40 years) with or without inservice inspection. The report concludes that inspection of 25% of each nozzle type is technically justified. [...]
>
> On December 19, 2007, the NRC issued a Safety Evaluation (SE) approving the use of BWRVIP-108. Within Section 5.0 of the SE, it states that each licensee should demonstrate the plant-specific applicability of the BWRVIP-108 Report to their units in the request for alternative by meeting the criteria discussed in Section 5 of the SE.
>
> The applicability of the BWRVIP-108 Report to [Vermont Yankee] is demonstrated by showing the criteria within Section 5 of the SE are met.

The licensee's basis for the proposed alternative in VY-ISI-014 includes a detailed evaluation of the criteria that must be satisfied in order to obtain authorization to implement ASME CC N-702, as established in the NRC staff's SE for BWRVIP-108, dated December 19, 2007. The NRC staff evaluation of these five criteria is discussed below in Section 3.3 of this SE for VY-ISI-014.

3.3 NRC Staff Evaluation

The NRC staff's December 19, 2007, SE for the BWRVIP-108 Report stated that licensees who plan to request relief from the ASME Code, Section XI requirements for RV 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 of the BWRVIP-108 Report to their units in the request by showing that all five of the general and nozzle-specific criteria are satisfied on a plant-specific basis. These five criteria are related to the driving force for crack growth due to thermal stress (caused by RV heatup and cooldown operations) and pressure loads, and they were used as inputs in probabilistic fracture mechanics (PFM) analyses for the recirculation inlet and outlet nozzles. In its SE for BWRVIP-108, the NRC staff stated that the RV nozzle material fracture toughness-related nil-ductility reference temperature (RT_{NDT}) values used in the PFM analyses were based on data from the entire fleet of BWR RVs. Therefore, the BWRVIP-108 PFM analyses are bounding with respect to fracture resistance. The NRC staff also stated in the SE that in order to demonstrate that the BWRVIP-108 criteria are bounding on a plant-specific basis (with respect to the driving force for crack growth), the licensee shall demonstrate that (1) the plant-specific maximum RV heatup/cooldown rate is bounded by the RV heatup/cooldown rate specified in the BWRVIP-108 SE, and (2) the plant-specific recirculation inlet and outlet nozzle crack growth driving force criteria (due to pressure loading) are bounded by the corresponding values for these nozzles from the BWRVIP-108 SE. The NRC staff noted in the BWRVIP-108 SE that only the recirculation inlet and outlet nozzles need to be analyzed, with respect to the crack

growth driving force criteria, because the probabilities of failure, P(FIE)s, for the other nozzles are an order of magnitude lower.

In its December 14, 2009, submittal for VY-ISI-014, the licensee provided its evaluation of the five criteria for the Vermont Yankee recirculation inlet and outlet nozzles, and the RV heat-up and cool-down rates, as established in the NRC staff's SE for BWRVIP-108, dated December 19, 2007. The licensee's plant-specific evaluation demonstrated that all five criteria related to the driving force for crack growth used in BWRVIP-108 PFM analyses are satisfied. The NRC staff independently reviewed the licensee's plant-specific analysis using the guidelines specified in December 19, 2007, SE for the BWRVIP-108 Report and determined that the licensee satisfactorily demonstrated that the maximum heat-up and cool-down rates for the Vermont Yankee RV and the crack growth driving force criteria for the Vermont Yankee recirculation inlet and outlet nozzles are bounded by the corresponding criteria specified in the SE for BWRVIP-108. A summary of the NRC staff's findings, related its determination that the licensee had satisfied these five criteria, is provided below:

(1) The maximum RV heat-up/cool-down rate shall be limited to less than 115 °F per hour:

The licensee stated that, in accordance with the Vermont Yankee Technical Specifications (TSs), Section 3.6.A.2, the RCS heat-up and cool-down rates are limited to a maximum of 100 °F, when averaged over any one hour period. Vermont Yankee operating procedures limit the RCS heat-up rate to a maximum of 90 °F/hour and the cool-down rate to between 50 °F/hour and 90 °F/hour. Therefore, based on the above specifications for the Vermont Yankee RCS heat-up/cool-down rates, the NRC staff found that the licensee had satisfied criterion (1) from the NRC staff SE for BWRVIP-108.

Recirculation Inlet Nozzles

(2) $(pr/t)/C_{i\text{-}RPV} < 1.15$, where p = normal RV operating pressure, r = RV inner radius, t = RV wall thickness, and C_{RPV} = 19332 psi (as specified in the NRC staff's SE for BWRVIP-108):

The licensee's calculated value for $(pr/t)/C_{RPV}$ is 0.96. The NRC staff independently confirmed the validity of this calculation. Therefore, the NRC staff found that the licensee has satisfied criterion (2) from the NRC staff's SE for BWRVIP-108.

(3) $[p(r_o^2 + r_i^2)/ (r_o^2 - r_i^2)]/C_{NOZZLE} < 1.15$, where p = normal RV operating pressure, r_o = recirculation inlet nozzle outer radius, r_i = nozzle inner radius, and C_{NOZZLE} = 1637 psi (as specified in the NRC staff's SE for BWRVIP-108):

The licensee's calculated value for $[p(r_o^2 + r_i^2)/ (r_o^2 - r_i^2)]/C_{NOZZLE}$ is 1.00. The NRC staff independently confirmed this calculation. Therefore the NRC staff found that the licensee had satisfied criterion (3) from the NRC staff's SE for BWRVIP-108.

Recirculation Outlet Nozzles

(4) $(pr/t)/C_{o\text{-}RPV} < 1.15$, where p = normal RV operating pressure, r = RV inner radius, t = RV wall thickness, and C_{RPV} = 16171 psi (as specified in the NRC staff's SE for BWRVIP-108):

The licensee's calculated value for $(pr/t)/C_{RPV}$ is 1.144. The NRC staff independently confirmed the validity of this calculation. Therefore, the NRC staff found that the licensee has satisfied criterion (4) from the NRC staff's SE for BWRVIP-108.

(5) $[p(r_o^2 + r_i^2)/ (r_o^2 - r_i^2)]/C_{NOZZLE} < 1.15$, where p = normal RV operating pressure, r_o = recirculation outlet nozzle outer radius, r_i = nozzle inner radius, and C_{NOZZLE} = 1977 psi (as specified in the NRC staff's SE for BWRVIP-108):

The licensee's calculated value for $[p(r_o^2 + r_i^2)/ (r_o^2 - r_i^2)]/C_{NOZZLE}$ is 0.906. The NRC staff independently confirmed this calculation. Therefore the NRC staff found that the licensee had satisfied criterion (5) from the NRC staff's SE for BWRVIP-108.

Therefore, with respect to the criteria related to the driving force for crack growth used in PFM analysis for the recirculation inlet and outlet nozzles, the NRC staff found the licensee's plant-specific analysis acceptable.

In order to support the NRC staff's determination that a reduction in Examination Category B-D nozzle-to-RV weld (including nozzle inner radius section) sample size, per ASME Code Case N-702, will provide an acceptable level of quality and safety, it is necessary to ensure that there is no active age-related degradation in the subject nozzle welds listed in VY-ISI-014. Therefore, in a request for additional information (RAI) issued by letter dated June 1, 2010, the NRC staff requested (in RAI Question 1 (RAI 1)) that the licensee confirm that the previous volumetric examinations for the aforementioned nozzle welds did not show any service-induced flaws. In its RAI response, dated July 1, 2010, the licensee stated that the previous volumetric examinations of the subject components found no evidence of service-induced degradation and resulted in no unacceptable indications, per the ASME Code, Section XI, Article IWB-3500 acceptance criteria. The NRC staff found the licensee's RAI response acceptable because the absence of any service-induced flaws in the subject welds indicates that there is no active aging degradation in these welds.

Low alloy steel welds are not considered susceptible to stress-corrosion cracking (SCC), whereas nickel alloy weld metals (specifically welds fabricated with the shielded metal arc welding (SMAW) process using alloy 182 weld metal, designated as UNS W86182, F-No. 43) are considered highly susceptible to SCC in a BWR environment. Several BWR plants have nozzles welded with alloy 182 weld metals. Therefore, the NRC staff determined that for welds fabricated with alloy 182 or other nickel-base alloy weld metal, the reduction in inspection sample size, as specified by ASME CC N-702 cannot be authorized. The NRC staff expects that all nozzle-to-RV welds fabricated with alloy 182 or other nickel-base alloy weld metal be examined in accordance with ASME Code, Section XI, Table IWB-2500-1, Examination Category B-D requirements. Therefore, in RAI 2, the NRC staff requested that the licensee describe the weld materials from which the subject RV nozzle welds in VY-ISI-014 were fabricated, including any weld repair materials. In its July 1, 2010, RAI response, the licensee stated that, in accordance with the welding procedures used by Chicago Bridge & Iron, the Vermont Yankee RV fabricator, the filler metal used for both the initial nozzle-to-RV welds and any weld repairs was an ASME Code, Section II-C, Specification SFA-5.5, Classification E8018NM low allow steel weld metal. The licensee stated that the nickel content of this filler metal is approximately one percent, which is well below the level where susceptibility to SCC is a concern. The NRC staff confirmed that the above weld metal specification is a low alloy steel material with a nickel content of between 0.80 and 1.20 percent. There is currently no known active aging degradation in carbon/low alloy steel welds; thus, the welds are acceptable for application of the provisions of ASME CC N-702. The NRC staff found the licensee's RAI response acceptable because the licensee adequately demonstrated that the subject nozzle-to-RV welds are low alloy steel welds that are not susceptible to SCC.

In RAI 3, the NRC staff requested that the licensee state whether the provisions of the ASME Code, Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems" have been and will continue to be used for volumetric examinations of the subject Examination Category B-D RV nozzle components. In its July 1, 2010, RAI response, the licensee stated that ultrasonic examination procedures at Vermont Yankee do satisfy the requirements of the ASME Code, Section XI, Appendix VIII. The NRC staff found the licensee's RAI response acceptable because the licensee stated that the provisions of the ASME Code, Section XI, Appendix VIII are used for ultrasonic volumetric examinations of the subject Examination Category B-D RV nozzle components.

Based on the above evaluation, the NRC staff determined that the reduced inspection sampling criteria specified in ASME CC N-702 may be applied to the subject Examination Category B-D RV nozzles at Vermont Yankee. The NRC staff notes that the RV feedwater nozzles and control rod drive return line nozzle are outside the scope of ASME CC N-702 and are, therefore, subject to normal ASME Code, Section XI, Table-IWB-2500-1 requirements.

4.0 CONCLUSION

The NRC staff reviewed the licensee's justification for using the guidelines addressed in the BWRVIP-108 Report as the technical basis for adopting ASME CC N-702 for the subject RV nozzle-to-vessel shell welds and nozzle inner radius sections described in Request for Alternative VY-ISI-014 and finds it acceptable based on the following:

1. The licensee successfully demonstrated that the subject RV nozzles described in VY-ISI-014 meet the requirements of the BWRVIP-108 Report as well as the plant-specific criteria specified in the NRC staff's December 19, 2007, SE for the BWRVIP-108 Report.

2. Previous volumetric examinations of the subject welds revealed no unacceptable flaws or evidence of service-induced degradation.

3. The subject welds addressed in the VY-ISI-014 are fabricated with low alloy weld metals which are not susceptible to SCC. Therefore, reduction in inspection sampling requirements for these welds, in accordance with ASME CC N-702, is acceptable.

4. The BWRVIP-108 PFM analyses are bounding with respect to the fracture resistance of the subject nozzles in VY-ISI-014.

Based on the above criteria, the NRC staff concludes that the licensee's proposed alternative for the subject RV nozzles described in VY-ISI-014 will provide an acceptable level of quality and safety. Therefore, Request for Alternative VY-ISI-014 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year interval ISI program at Vermont Yankee, and the licensee may implement ASME CC N-702 for inspections of the subject ASME Code Class 1, Examination Category B-D RV nozzle components.

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

Principal Contributor: Christopher Sydnor

Date: October 1, 2010

If you have any questions regarding this approval, please contact the Vermont Yankee Project Manager, James Kim, at 301-415-4125.

Sincerely,

/ra/

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

Docket No. 50-271

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