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February 20, 2008
L-08-066

10 CFR 50.55a

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

SUBJECT:
Perry Nuclear Power Plant
Docket No. 50-440, License No. NPF-58
Perry Nuclear Power Plant Inservice Inspection Program Relief Requests IR-043, Revision 1, IR-055, IR-056, and IR-057

In accordance with 10 CFR 50.55a, Nuclear Regulatory Commission (NRC) Staff review and approval of four requests for relief from certain Inservice Inspection (ISI) requirements associated with the implementation of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code for the Perry Nuclear Power Plant (PNPP) is requested.

Enclosures 1, 2, 3, and 4 contain the identification of the affected components, the applicable code requirements, the description and basis of the proposed relief requests, and the proposed alternative for each relief request. The relief requests are proposed for use during the remainder of the current PNPP 10-year ISI interval. Approval of the relief requests is requested by February 20, 2009, to support PNPP's twelfth refueling outage.

There are no regulatory commitments contained in this submittal. If there are any questions, or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 761-6071.

Sincerely,

Barry S. Allen

Barry S. Allen

Enclosures:

1. Relief Request IR-043, Rev. 1
2. Relief Request IR-055
3. Relief Request IR-056
4. Relief Request IR-057

cc: NRC Region III Administrator
NRC Resident Inspector
NRR Project Manager
State of Ohio

A047
NRR

Enclosure 1
L-08-066

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST No. IR-043, Rev 1

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(ii)

1. Identification of Components

Class 1, Category B-M-1, Item No.'s B12.30 (valves less than Nominal Pipe Size (NPS) 4) and B12.40 (valves NPS 4 or larger), Valve Body Welds identified as follows:

ISI Exam ID	Item No.	Description	Group	ISI Isometric Drawing
1G33-F0101-SEAM	B12.30	3" Gate Valve Body Weld	1	SS-305-671-108
1G33-F0100-SEAM	B12.40	4" Gate Valve Body Weld	2	SS-305-671-108
1G33-F0106-SEAM	B12.40	4" Gate Valve Body Weld	2	SS-305-671-108
1G33-F0001-SEAM	B12.40	6" Gate Valve Body Weld	3	SS-305-671-108
1G33-F0004-SEAM	B12.40	6" Gate Valve Body Weld	3	SS-305-671-108

2. Applicable Code Edition and Addenda

Perry is currently in its second 10-year inspection interval and complies with the 1989 Edition of ASME XI. Additionally, for ultrasonic examinations Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 Edition with the 1996 Addenda is implemented as required (and modified) by 10 CFR 50.55a.

3. Applicable Code Requirements

Table IWB-2500-1, Category B-M-1 requires surface examination of valve body welds in valves less than 4" NPS and volumetric examination of valve body welds in valves 4" NPS and larger as defined by Figure IWB-2500-17. Note 3 of Table IWB-2500-1 states that the examinations are limited to at least one valve within each group of valves that are of the same size, construction design (such as globe, gate, or check valves), and manufacturing method, and that perform similar functions in the system (such as containment isolation or overpressure protection). Within the Reactor Water Cleanup system (G33), there are five (5) Category B-M-1 valves. In accordance with Note 3, the five valves are grouped into three groupings. Thus three Reactor Water Cleanup system valve body welds require Category B-M-1 examinations.

4. Reason for Request

The reason for this relief request is dose avoidance. Three of the identified valve body welds require examination prior to the end of Perry's current inspection interval (i.e., RFO12, which is scheduled for February 2009). Various dose surveys from 2003 to 2007 show that the dose rates at the subject Reactor Water Cleanup system

valves have ranged from 400 mRem/hr to 3,000 mRem/hr. Approximately 1 hour must be spent at each valve location to perform the examination support work (e.g., insulation removal and reinstallation) and the nondestructive examinations. It is estimated that eliminating the Category B-M-1 required examinations for these three Reactor Water Cleanup system valve body welds will provide for a dose savings of at least 4,400 mRem.

5. Proposed Alternative and Basis for Use

Proposed Alternative:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from performing the surface or volumetric examinations of the subject valve body welds due to radiological concerns. In accordance with Examination Category B-P, the welds will receive a VT-2 examination each refueling outage during the performance of the system leakage test of the Class 1 boundary.

Basis for Use:

The structural integrity of the pressure boundary was demonstrated during construction by meeting the requirements of the ASME Code Section III. The subject welds were examined in accordance with the appropriate Code requirements, weld techniques and welders were qualified in accordance with Code requirements, and materials were purchased and traced in accordance with the appropriate Code and NRC requirements and guidelines.

The subject valve body welds received preservice examinations and inservice examinations during the first 10-year inspection interval, which were performed when the piping and valves were at considerably lower dose rates, and no relevant indications were identified.

The subject valves are Borg Warner gate valves within the Reactor Water Cleanup system. Perry has 12 similar Borg Warner gate valves in other Class 1 piping systems. These 12 valves range in size from 6" to 12"; they have the same weld configuration as the Reactor Water Cleanup system valves, and as part of the Class 1 boundary, are subject to the same operating pressures and temperatures. See Page 4 for drawings of the Reactor Water Cleanup system valves and drawings typical of the other valves. The 12 valves in the other systems are broken into five groupings and thus five Category B-M-1 welds will remain scheduled. Of those, three have already been examined this interval and there were no relevant indications.

A search of industry Operating Experience did not identify any failures of valve body welds. In fact, due in part to their excellent performance, a revision to ASME Section XI was recently approved that will delete Category B-M-1 valve body weld examinations when the 2008 Addenda is published (ASME B&PVC Standards Committee record 05-1226).

Summary:

In summary, because of the acceptable initial condition, satisfactory preservice and first interval inservice examinations, the ability to fully examine other Category B-M-1 valve body welds that are of essentially the same design, from the same manufacturer, and subject to the same operating conditions, and the fact that the subject welds will still be VT-2 examined each refueling outage, it is concluded that the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

6. Duration of Proposed Alternative

Upon approval by the NRC Staff, this relief request will be utilized through the remainder of Perry's second 10-year inspection interval (November 18, 1998 – May 17, 2009; with the current 10-year inspection interval being extended by 6-months in accordance with IWA-2430(d)).

7. Precedents

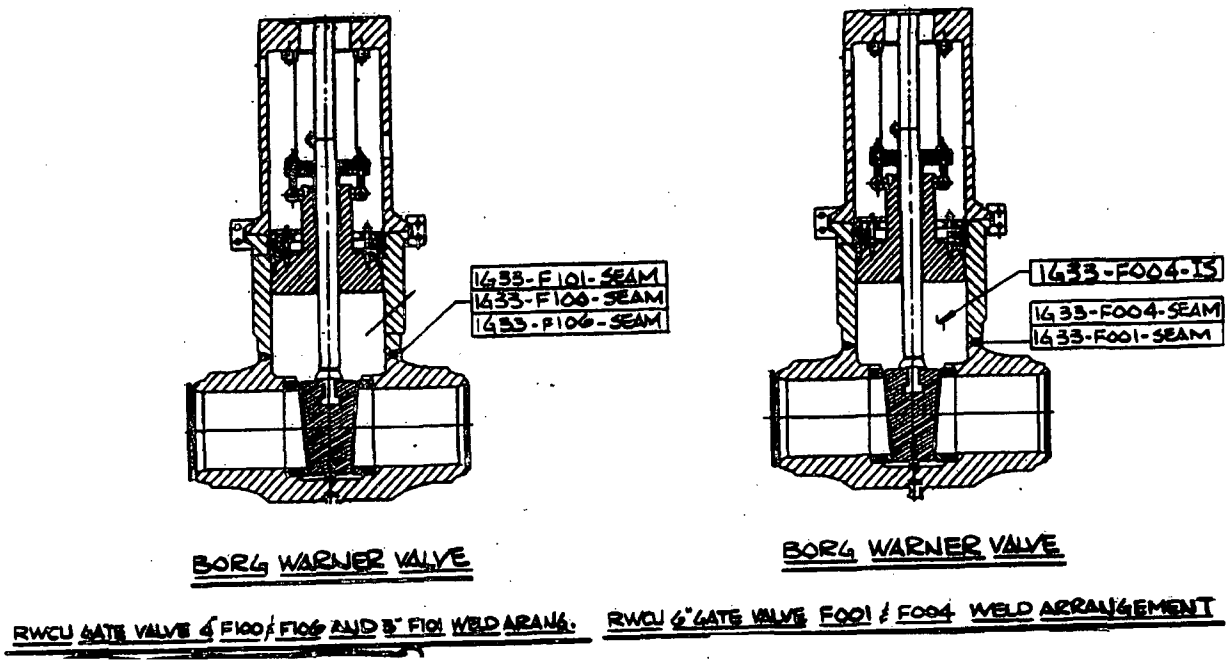
Under Revision 0 of this Relief Request, relief from examining Category B-M-1 weld 1G33-F101-SEAM during the current 10-year inspection interval was already granted. Refer to TAC No. MA3437, dated November 22, 1999.

8. References

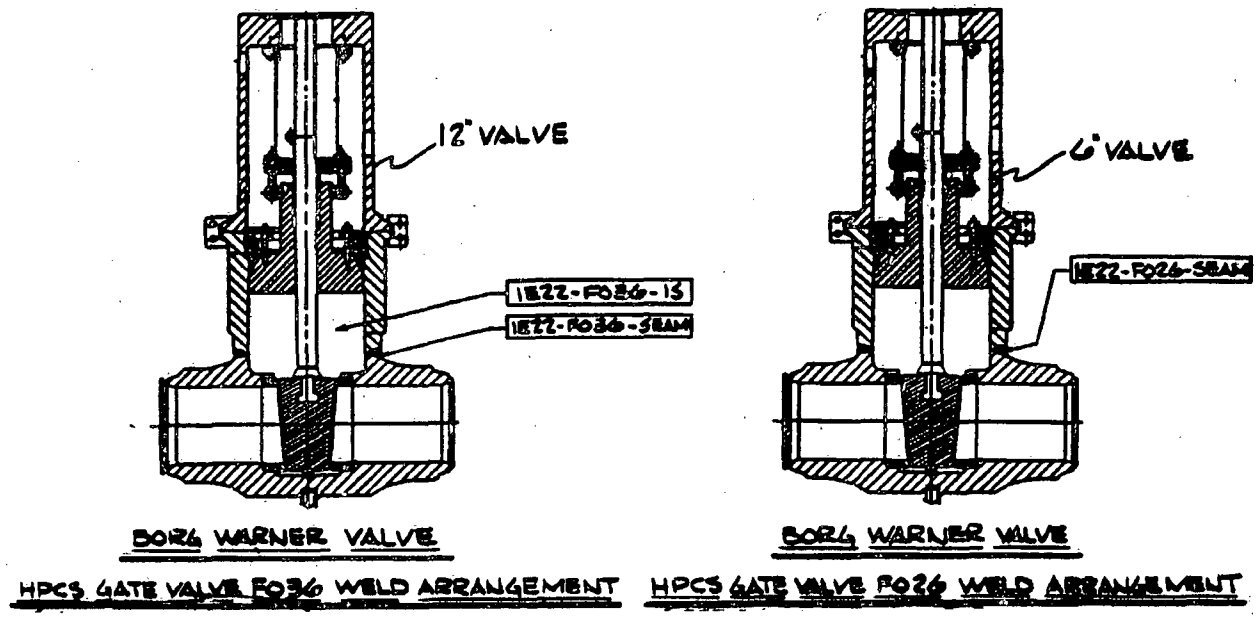
1. ASME Boiler and Pressure Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants," 1989 Edition with no Addenda.

2. ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants," 1995 Edition with the 1996 Addenda.

3. Anthony J. Mendiola, Division of Licensing Project Management, to John Wood, Perry Vice President – Nuclear, "Safety Evaluation of the Inservice Inspection Program Second 10-Year Interval Requests for Relief for FirstEnergy Nuclear Operating Company – Perry Nuclear Power Plant, Unit 1 (TAC No. MA3437)," November 22, 1999.



Reactor Water Cleanup System Category B-M-1 Valves
(Excerpt from Drawing 305-571-108)



Valve Configurations Typical of Category B-M-1 Gate Valves in other Class 1 Systems
(Excerpt from Drawing 305-701-114)

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST No. IR-055, Rev 0

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(ii)

1. Identification of Components

Class 1, ASME Code Case N-578, Category R-A (Risk-Informed Piping Examinations), Item No. R1.16 (Elements Subject to Intergranular Stress Corrosion Cracking (IGSCC)), Piping Weld identified as follows:

ISI Exam ID	Description
1B13-N1B-KB	22" Reactor Recirculation Outlet Nozzle-to-Safe-End Weld

2. Applicable Code Edition and Addenda

Perry is currently in its second 10-year inspection interval and complies with the 1989 Edition of ASME XI. Furthermore, Class 1 piping weld examinations are conducted in accordance with Perry's Risk-Informed Inservice Inspection (ISI) Program. The Risk-Informed ISI Program was submitted to the NRC as Relief Request IR-049 by letters PY-CEI/NRR-2528L, dated February 12, 2001, and PY-CEI/NRR-2577L, dated July 9, 2001, and was approved by the NRC on October 17, 2001 (TAC No. MB1174). Additionally, for ultrasonic examinations Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 Edition with the 1996 Addenda is implemented as required (and modified) by 10 CFR 50.55a.

3. Applicable Code Requirements

The subject weld is a Class 1 dissimilar metal weld and thus would normally fall under Table IWB-2500-1, Category B-F, Pressure Retaining Dissimilar Metal Welds, for its selection and frequency requirements. However, as stated above, Perry has implemented a Risk-Informed (RI) ISI Program for the Class 1 welds. In the RI – ISI program, the subject weld is classified as Exam Category R-A, Item No. R1.16 as specified within Code Case N-578, Table 1. However, this weld also falls within the scope of Perry's inspection program for NRC Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," and is classified as a GL 88-01 Category C weld because it contains susceptible material and was stress improved after two years of operation. The GL 88-01 inspection program requirements are the most restrictive as detailed below.

As delineated in Relief Request IR-049, Perry's RI – ISI program was developed in accordance with Electric Power Research Institute (EPRI)

Topical Report TR-112657 Rev. B-A and is consistent with the American Society of Mechanical Engineers (ASME) Code Case N-578. In general, EPRI TR-112657 requires that 25% of the high risk welds and 10% of the medium risk welds be selected for inspection within each 10-year inspection interval, and the total number of Class 1 welds selected for each 10-year inspection interval should be at least 10%. The subject weld is a medium risk weld and therefore is in a category where only 10% of the welds would need to be inspected each 10-year inspection interval. However, EPRI TR-112657 states that for welds that were included in the existing plant IGSCC inspection program, and were categorized as GL 88-01 Category B through G, the number, location, and frequency of inspection are to continue to be the same as the existing plant IGSCC inspection program. The subject weld was not chosen as one of the medium risk weld selections to meet the RI – ISI program, but is still scheduled for examination each 10-year interval to satisfy the GL 88-01 program requirements.

The subject weld is a dissimilar metal weld potentially subject to IGSCC. As such, EPRI TR-112657 requires that the examination be a volumetric examination performed with ultrasonic procedures designed specifically for detection and characterization of IGSCC. Additionally, 10 CFR 50.55a requires (as of November 22, 2002) that all dissimilar metal weld ultrasonic exams are to be performed in accordance with ASME Section XI, Appendix VIII, Supplement 10, of the 1995 Edition with the 1996 Addenda as modified by 10 CFR 50.55a(b)(2)(xiv, xv, and xvi).

4. Reason for Request

The reason for this 10 CR 50.55a request is dose avoidance. The subject weld is the Reactor Recirculation (RR) Outlet "B" (N1B) nozzle-to-safe-end weld that is located within Perry's reactor vessel biological shield wall. The guillotine shield doors and the metal jacketed insulation for the RR outlet bioshield penetrations interfere with access to the weld. To access the weld, insulation panels and sleeves must be removed and the guillotine doors must be opened. Figure 1 shows the weld location relative to the insulation panels and guillotine doors. Figures 2 and 3 show the nozzle-to-safe-end configuration prior to removing the inside insulation panels and after removing the inside insulation panels, but prior to opening the guillotine doors. The metal jacketed insulation sleeve that is shown covering the weld in Figure 3 cannot be removed without opening the guillotine doors. The guillotine doors are opened by a crank mechanism from outside the bioshield. Before they can be opened, scaffolding must be erected, insulation must be removed from the RR outlet piping, and penetration shield blocks that are held in place by metal straps that are bolted to the guillotine doors must be removed. Figure 4 shows the outside of the bioshield penetration for the identical Perry RR Outlet nozzle-to-safe-end weld (N1A) - prior to removal of the shield blocks and opening the guillotine doors. The subject weld (N1B) is located in a high

dose area with contact dose rates of as much as 5,000 mRem/hour and general area dose rates of as much as 1,000 mRem/hr. During Perry's most recent refueling outage (RFO11), the N1A outlet nozzle-to-safe-end-weld was examined, and even with nozzle flushing and hydrolazing of the outlet line, it took over 8,100 mRem to complete the exams.

In addition to the interferences described above, the N1B nozzle-to-safe-end weld is surrounded by a jet impingement shield where it exits the bioshield, and the jet impingement shield has permanent lead shielding hanging from it (see Figures 5 and 6). In order to open the N1B guillotine shield doors, partial disassembly of the jet impingement shield is necessary. The additional work necessary for removal of the jet impingement shield interference will more than double the work durations in the high radiation areas. Thus, the dose to examine the N1B nozzle-to-safe-end weld is expected to be at least 16,000 mRem.

5. Proposed Alternative and Basis for Use

Proposed Alternative:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from performing the volumetric examinations of the subject weld due to radiological concerns. In accordance with Examination Category B-P, the weld will receive a VT-2 examination each refueling outage during the performance of the system leakage test of the Class 1 boundary. Perry's reactor bioshield configuration provides for accessing the bioshield area during the system leakage test and directly viewing the nozzle assemblies.

Basis for Use:

The structural integrity of the pressure boundary was demonstrated during construction by meeting the requirements of the ASME Code Section III. The subject weld was examined in accordance with the appropriate Code requirements, weld techniques and welders were qualified in accordance with Code requirements, and materials were purchased and traced in accordance with the appropriate Code and NRC requirements and guidelines. A review of the construction radiographs did not indicate any weld repairs.

The N1B nozzle-to-safe-end weld was examined four times during the first 10-year inspection interval; RFO2 (1991), prior to and after receiving the Mechanical Stress Improvement Process (MSIP) during RFO3 (1992), and most recently in RFO5 (1996). All the examinations were performed using EPRI qualified IGSCC procedures and personnel. No relevant indications have been found. In light of recent industry operating experience, the electronic examination data from the 1996 examinations was re-evaluated using the current state of the art evaluation software. The evaluation did find

that there were transducer contact problems, but the contact problems were never greater than one scan increment in width (0.199") and the analyst concluded that it is unlikely that a flaw would have been missed. The 1996 electronic examination data from the identical N1A nozzle-to-safe-end weld was also reviewed and found to look very similar to the N1B data. The N1A nozzle-to-safe-end weld was examined in RFO11 (April 2007) using fully qualified Appendix VIII, Supplement 10 procedures and personnel, and no inservice flaw indications were found.

As previously stated, the subject weld was not specifically a risk-informed selection under Perry's RI – ISI program, but is scheduled for inspection because it was scheduled for inspection in accordance with Perry's existing IGSCC program. Within Perry's RI – ISI submittal, it states that only those locations selected strictly for RI – ISI purposes were compared to the Section XI inspection locations to determine the change in risk. Thus deleting examination of the subject weld has no impact on the RI – ISI change in risk assessment. Furthermore, Perry has 800 Class 1 welds and 83 are scheduled for inspection under the RI – ISI program. With deletion of the subject weld, the overall RI – ISI program goal of examining at least 10% of the Class 1 weld population is still met.

At the time that Perry established its RI – ISI program for Class 1 welds, austenitic stainless steel and Inconel welds were all examined in accordance with the requirements of GL 88-01. This included examination of 100% of the GL 88-01 Category C welds every 10 years. Since that time, the Boiling Water Reactor Vessel and Internals Project (BWRVIP) developed a technical report, BWRVIP-75-A, "BWR Vessel and Internals Project Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules" that provides an NRC approved technical basis for revisions to the GL 88-01 inspection schedules. In accordance with BWRVIP-75-A, Category C welds that have received a preservice examination following stress improvement and a subsequent inservice examination need only be examined at a rate of 25% every ten years, or only 10% with effective Hydrogen Water Chemistry (HWC). Perry has 25 Category C welds, all of which received MSIP and a post-stress-improvement preservice examination in RFO3, an inservice examination in RFO5, and all have been examined or are scheduled for examination in the current 10-year ISI interval. Thus, apart from the commitment within Perry's RI – ISI submittal to continue performing IGSCC examinations in accordance with the existing IGSCC program, deletion of the examination of only one of the 25 Category C welds is technically justified and will have no negative effect on meeting any other examination requirements.

Water chemistry is an important factor in the initiation and growth rates for IGSCC. Maintaining good water chemistry and implementation of HWC are the major strategies for limiting and/or mitigating IGSCC. The BWR water chemistry guidelines are contained in BWRVIP-130, "BWR Water Chemistry

Guidelines." Furthermore, BWRVIP-62, "Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection" discusses applying Factors Of Improvement (FOI) to reduce inspections of components subject to IGSCC for plants on either Moderate HWC or HWC with Noble Metals Chemical Addition (NMCA). Perry implemented HWC with NMCA in 2002. The oxidizing environment in a BWR is measured by Electrochemical Potential (ECP). Perry's ECP levels have been calculated to be consistently <-230 my (SHE). With regard to HWC availability, in accordance with BWRVIP-130, the target for plants with HWC with NMCA is 98%. Perry's availability over each operating cycle has averaged at least 87% and for the most recent full operating cycle Perry's availability was 97.1%. As Perry's HWC availability has not yet met the target set in BWRVIP-130, no inspection relief for piping examinations based on HWC has been applied. Although Perry is not taking credit for HWC, BWRVIP-62 does show FOIs for HWC as low as 70% availability when a consistent ECP can be demonstrated. With an ECP consistently <-230 and >70% availability, it shows that a FOI of two in crack growth rate retardation can be achieved for both stainless steel and Alloy 182 materials (1B13-N1B-KB involves both of these materials).

Summary:

In summary, because of the acceptable initial condition, satisfactory preservice and first interval inservice examinations, the recent acceptable Appendix VIII, Supplement 10, inservice examination of the identical N1A nozzle-to-safe-end weld, the IGSCC mitigation effects of MSIP and HWC, and the fact that the subject weld assembly can be directly VT-2 examined each refueling outage, it is concluded that the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

6. Duration of Proposed Alternative

Upon approval by the NRC Staff, this relief request will be utilized through the remainder of Perry's second 10-year inspection interval (November 18, 1998 – May 17, 2009; with the current 10-year inspection interval being extended by 6-months in accordance with IWA-2430(d)).

7. References

1. ASME Boiler and Pressure Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants," 1989 Edition with no Addenda.
2. ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants," 1995 Edition with the 1996 Addenda.

3. ASME Code Case N-578, "Risk-Informed Requirements for Class 1, 2, and 3 Piping, Method B, Section XI, Division 1," September 2, 1997.

4. EPRI Topical Report TR-112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," Rev B-A, December 1999.

5. EPRI Topical Report TR-105873, "BWR Vessel and Internals Project, Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection (BWRVIP-62)," December 1998.

6. EPRI Technical Report 1012621, "BWRVIP 75-A: BWR Vessel and Internals Project Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules," October 2005.

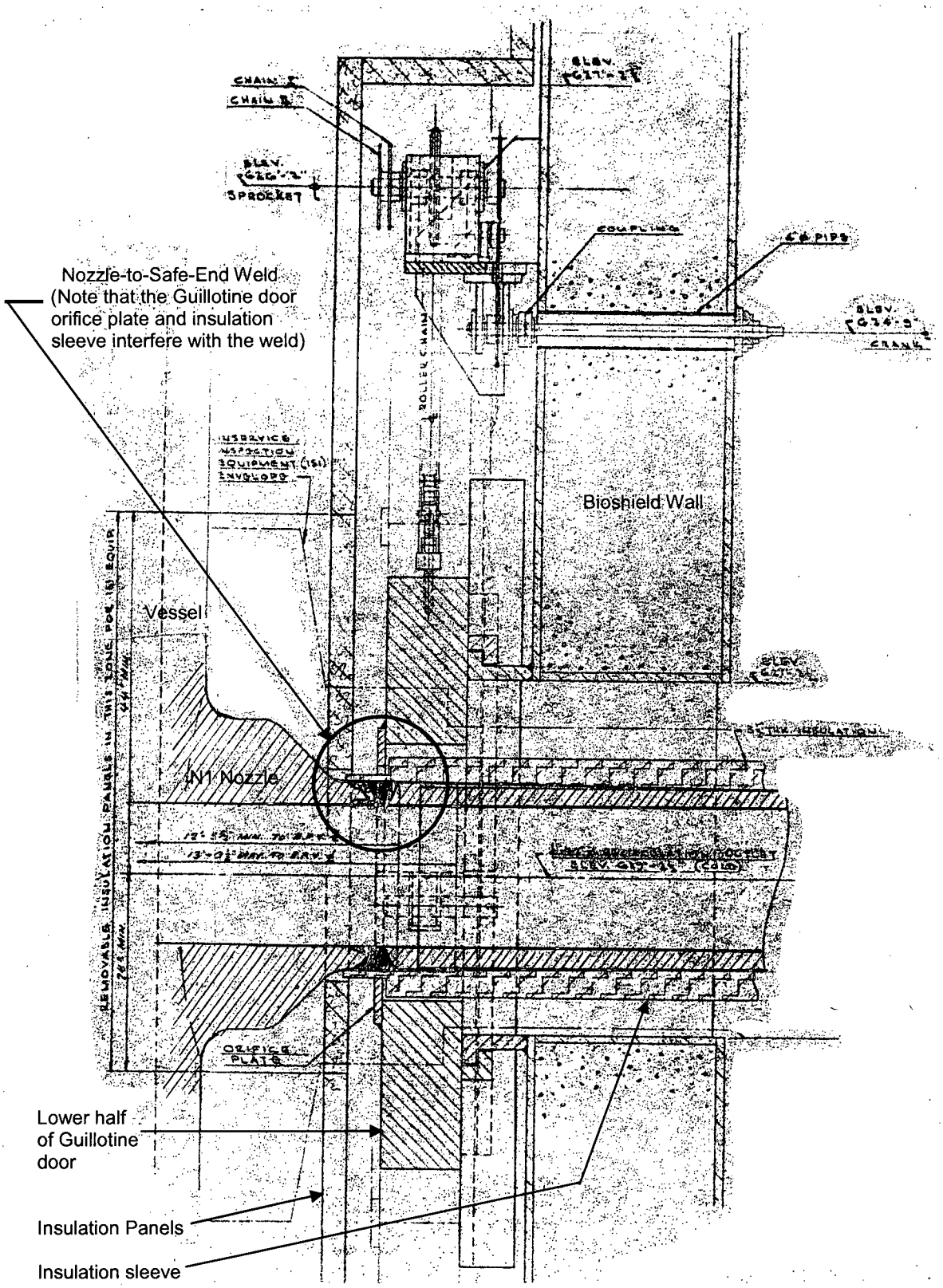
7. EPRI Technical Report 1008192, "BWRVIP-130: BWR Vessel and Internals Project, BWR Water Chemistry Guidelines – 2004 Revision," October 2004.

8. US Nuclear Regulatory Commission, NRC Generic Letter (GL) 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," January 25, 1988.

9. Letter, J. K. Wood to U.S. Nuclear Regulatory Commission, containing Risk-Informed Inservice Inspection Program Plan– Perry Nuclear Power Plant, Unit 1, PY-CEI/NRR-2528L, February 12, 2001.

10. Letter, J. K. Wood to U.S. Nuclear Regulatory Commission, containing Perry Nuclear Power Plant Responses to an NRC Request for Additional Information (RAI), PY-CEI/NRR-2577L, July 9, 2001.

11. Anthony J. Mendiola, Division of Licensing Project Management, to John Wood, Perry Vice President – Nuclear, "Perry Nuclear Power Plant, Unit 1 - Safety Evaluation of Relief Request IR-049 Associated With The Second 10-Year Interval Inservice Testing Program (TAC No. MB1174)," October 17, 2001.



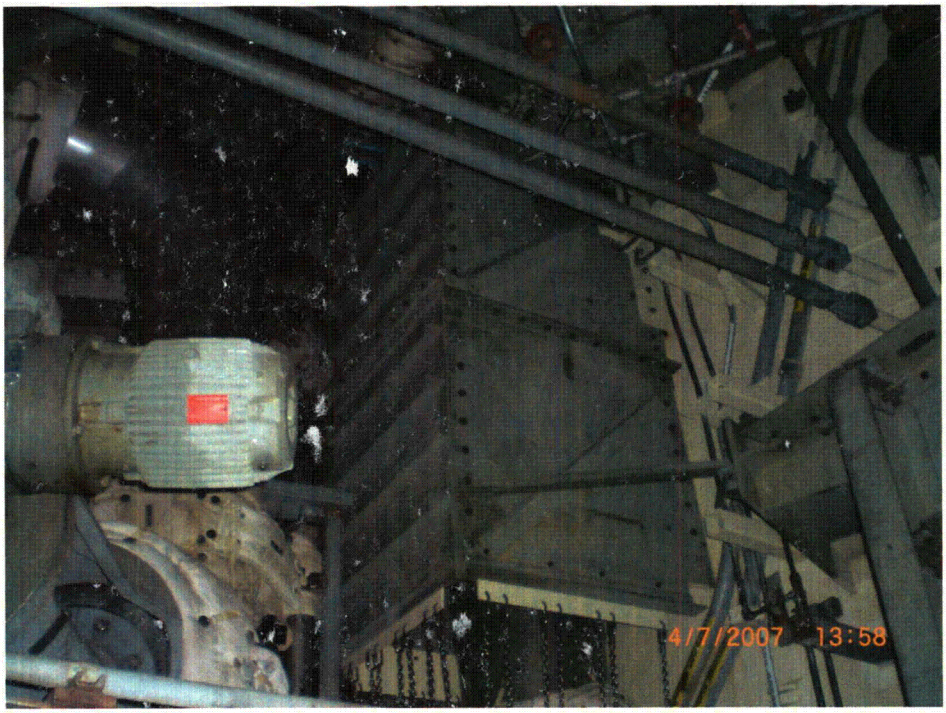
IR-055 Figure 1
Sectional View of N1 Bioshield Penetration with Guillotine Shield Doors and Insulation

IR-055 Figure 2
View of N1 Nozzle Bioshield Penetration with Insulation Panels Installed

IR-055 Figure 3
View of how Guillotine Doors and Insulation Sleeve Interfere
with N1 Nozzle-to-Safe-End Weld

IR-055 Figure 4
View of N1A Bioshield Penetration with Shield Blocks in Place

Note: The keeper bars for the shield blocks bolt directly into the guillotine doors. The bolts are approximately 14" long and go through 7 layers of shield blocks. The keeper bars and all the shield blocks must be removed before the bioshield penetration guillotine doors can be cranked open.



IR-055 Figure 5
Jet Impingement Shield Surrounding Bravo Recirculation Suction Line

IR-055 Figure 6
Permanent Lead Shielding supported by the Jet Impingement Shield Assembly

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST No. IR-056, Rev 0

Proposed Alternative
in Accordance with 10 CFR 50.55a(a)(3)(i)

1. Identification of Components

ASME Section XI, Class 1, Examination Category B-N-2 (Integrally Welded Core Support Structures and Interior Attachments to Reactor Vessels), Item No. B13.40 - Core Support Structure

2. Applicable Code Edition and Addenda

Perry is currently in its second 10-year inspection interval and complies with the 1989 Edition of ASME XI.

3. Applicable Code Requirements

ASME Section XI requires the examination of components within the Reactor Pressure Vessel. These examinations are included in Table IWB-2500-1 Category B-N-2 with the following item number:

B13.40 Examine accessible surfaces of the core support structure each interval by the VT-3 method.

These examinations are performed to assess the structural integrity of the core support structures within the boiling water reactor pressure vessel. For the current inspection interval, all the item B13.10 (vessel interior), B13.20 (interior attachment welds within the beltline region) and B13.30 (interior attachment welds beyond the beltline region) examinations have been, or will be, completed in accordance with the Code of record.

4. Reason for Request

In accordance with 10 CFR 50.55a(a)(3)(i), FirstEnergy is requesting a proposed alternative to the Code requirements provided above on the basis that the use of the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines discussed below will provide an acceptable level of quality and safety.

The BWRVIP Inspection and Evaluation (I&E) guidelines have recommended aggressive specific inspection by Boiling Water Reactor (BWR) operators to completely identify material condition issues with BWR components. A wealth of inspection data has been gathered during these inspections across the BWR industry.

The I&E guidelines focus on specific and susceptible components, specify appropriate inspection methods capable of identifying real anticipated degradation mechanisms, and require re-examination at conservative intervals. In contrast, the Code inspection requirements were prepared before the BWRVIP initiative and have not evolved with BWR inspection experience.

Use of this proposed alternative will maintain an adequate level of quality and safety and avoid unnecessary inspections, while conserving radiological dose.

5. Proposed Alternative and Basis for Use

Proposed Alternative:

In lieu of the requirements of ASME Section XI, the proposed alternative is detailed in attached Table 1 for Examination Category B-N-2, Item No. B13.40.

FirstEnergy will satisfy the Examination Category B-N-2, Item No. B13.40 requirements as described in Table 1 in accordance with BWRVIP guideline requirements. This relief request proposes to utilize the identified BWRVIP guidelines in lieu of the associated Code requirements, including examination method, examination volume, frequency, training, successive and additional examinations, flaw evaluations, and reporting.

Not all the components addressed by these guidelines are Code components. The particular guidelines that are applicable to the subject Code components are:

BWRVIP-03, "BWR Vessel and Internals Project, Reactor Pressure Vessel and Internals Examination Guidelines"
BWRVIP-26-A, "BWR Top Guide Inspection and Flaw Evaluation Guidelines"
BWRVIP-38, "BWR Shroud Support Inspection and Flaw Evaluation Guidelines"
BWRVIP-47-A, "BWR Lower Plenum Inspection and Flaw Evaluation Guidelines"
BWRVIP-76, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines" (replaced BWRVIP-01, -07, and –63)
BWRVIP-25, "BWR Core Plate Inspection and Flaw Evaluation Guidelines."

Table 1 compares present ASME Examination Category B-N-2, Item No. B13.40 requirements with the above current BWRVIP guideline requirements, as applicable to Perry Nuclear Power Plant. Table 2 provides the inspection history for Perry's Core Support Structures.

Any deviations from the referenced BWRVIP Guidelines for the duration of the proposed alternative will be appropriately documented and communicated to the NRC, per the BWRVIP Deviation Disposition Process. Currently, FirstEnergy does not have any deviations from the subject guidelines.

Implementation of the proposed alternative actions of this relief request will be subject to inspection by an Authorized Inspection Agency.

Basis for Use:

BWRs now examine reactor internals in accordance with BWRVIP guidelines. These guidelines have been written to address the safety significant vessel internal components and to examine and evaluate the examination results for these components using appropriate methods and re-examination frequencies. The BWRVIP has established a reporting protocol for examination results and deviations. The NRC has agreed with the BWRVIP approach in principle and has issued Safety Evaluations for these guidelines (see References 1 – 8 below). Therefore, use of these guidelines as an alternative to the subject Code requirements provide an acceptable level of quality and safety and will not adversely impact the health and safety of the public.

As additional justification, Attachment 1 ("Comparison of Code Examination Requirements to BWRVIP Examination Requirements") provides specific examples which compare the inspection requirements of Table IWB-2500-1, Item No. B13.40, to the inspection requirements in the BWRVIP documents. Specific BWRVIP documents are provided as examples. This comparison also includes a discussion of the inspection methods. These comparisons demonstrate that use of these guidelines, as an alternative to the subject Code requirements, provides an acceptable level of quality and safety and will not adversely impact the health and safety of the public.

6. Duration of Proposed Alternative

Upon approval by the NRC Staff, this relief request will be utilized through the remainder of Perry's second 10-Year inspection interval (November 18, 1998 — May 17, 2009; with the current 10-year inspection interval being extended by 6 months in accordance with IWA-2430(d)).

7. Precedents

A similar relief request was approved for Vermont Yankee Nuclear Power Station as discussed in Reference 1.

8. References

1. Letter from U. S. Nuclear Regulatory Commission (USNRC) to Entergy Nuclear Operations, "Safety Evaluation of Relief Request RI-01, Vermont Yankee Nuclear Power Station" (TAC NO. MC0690), dated September 19, 2005

2. Letter USNRC to BWRVIP, dated April 27, 1998, "Final Supplement to the Safety Evaluation of the Boiling Water Reactor Vessel And Internals Project BWRVIP-07 Report (TAC NO. M94959)"

3. Letter USNRC to BWRVIP, dated October 6, 1999, "Staff Reevaluation of Table 1 in the BWRVIP-07 Report (TAC NO. M94959)"

4. Letter USNRC to BWRVIP, dated December 19, 1999, "Final Safety Evaluation of BWRVIP Vessel and Internals Project, "BWR Vessel and Internals Project, BWR Core Plate Inspection and Flaw Evaluation Guidelines (BWRVIP-25)", EPRI Report TR-107284, December 1996 (TAC NO. M97802)"

5. Letter USNRC to BWRVIP, dated September 9, 2005, "NRC Approval Letter of BWRVIP-26-A, 'BWR Vessel and Internals Project Boiling Water Reactor Top Guide Inspection and Flaw Evaluation Guidelines' "

6. Letter USNRC to BWRVIP, dated July 24, 2000, "Final Safety Evaluation of the 'BWR Vessel and Internals Project, BWR Shroud Support Inspection and Flaw Evaluation Guidelines (BWRVIP-38),' EPRI Report TR-108823 (TAC NO. M99638)"

7. Letter USNRC to BWRVIP, dated September 9, 2005, "NRC Approval Letter of BWRVIP-47-A, 'BWR Vessel and Internals Project Boiling Water Reactor Lower Plenum Inspection and Flaw Evaluation Guidelines' "

8. Letter USNRC to BWRVIP, dated August 20, 2001, "Final Safety Evaluation of the 'BWR Vessel and Internals Project, Shroud Vertical Weld Inspection and Evaluation Guidelines (BWRVIP-63),' (TAC NO. MA6015)"

TABLE 1

Comparison of ASME Examination Category B-N-2 Requirements With BWRVIP Guidance Requirements for BWR/6 [1]

ASME Item No. Table IWB-2500-1	Core Support Structure Components	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Document	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.40	Shroud Support Plate	Accessible Surfaces	VT-3	Each 10-year Interval	BWRVIP-38, 3.2.2, Figures 3-4, 3-5	Welds H8 and H9[2]	EVT-1 or UT	Based on as-found conditions, to a maximum 6 years for one side EVT-1, 10 years for UT
	Shroud Support Legs	Accessible Surfaces (beneath core plate; rarely accessible)			BWRVIP-38, 3.2.3	Welds H10, H11 and H12	Per BWRVIP-38 NRC SER (7/24/00), inspect with appropriate method (4)	When accessible
	Shroud Horizontal welds	Accessible Surfaces			BWRVIP-76, 2.2 Figure 2-2[3]	Welds H1-H7 as applicable	EVT-1 or UT	Based on as-found conditions, to a maximum 6 years for one side EVT-1, 10 years for UT
	Shroud Vertical welds				BWRVIP-76, 2.3, 3-3, Figures 2-4, 3-2, 3-3	Vertical and Ring Segment Welds	EVT-1 or UT	Maximum 6 years for one-sided EVT-1, 10 years for UT; only required when horizontal welds are found to contain flaws exceeding certain limits or the shroud is a repaired shroud
	Shroud Repairs [3]				BWRVIP-76, 3.5, 3.6	Tie-Rod Repair	VT-3	Per repair designer recommendations per BWRVIP-76
	Top Guide and Top Guide Grid				BWRVIP-26-A 3.2 Table 3-2	Top Guide Studs	VT-3	Each 10-year Interval
	Core Support Plate				BWRVIP-25 3.2 Table 3.2	None for BWR/6	N/A	N/A
	Control Rod Guide Tubes (CRGTs)				BWRVIP-47-A 3.2 Table 3.3	CRGT Body Welds and Fuel Support Pins and Lugs	EVT-1 of body welds and VT-3 of pins and lugs	10% of the CRGT Assemblies within 12 years

NOTES:

1) This Table provides an overview of the requirements. For more details, refer to ASME Section XI, Table IWB-2500-1, and the appropriate BWRVIP document.
2) For Perry this results in a requirement of 10% of the weld length. However, for H9 essentially 100% of the weld length was ultrasonically examined.
3) Perry's shroud is a Category B un-repaired shroud.
4) When inspection tooling and methodologies are available, they will be utilized to establish a baseline inspection of these welds. Until such time, and as committed to in BWRVIP-47-A, Section 3.2.5, visual inspections of the lower plenum area (which includes the shroud support legs) will be performed to the extent practical when access is made available through non-routine refueling outage activities (e.g., jet pump disassembly).

TABLE 2

Perry Nuclear Power Plant
Reactor Core Support Structures Inspection History

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-Inspections
Core Shroud (VIP-76)	1994 (RF4)	VT-3 and EVT-1	In RF4, VT-3 of entire shroud interior and EVT-1 of the H-3 and H-4 weld inside surfaces at 4 appx 1ft long sample locations. No indications.
	1997 (RF6)	VT-3	In RF6, a Code VT-3 exam was performed on all accessible shroud exterior areas. No indications.
	1999 (RF7)	UT	In RF7, UT examination of the H-3, H-4, H-6A and H-7 welds was performed in accordance with the Category B Plant guidelines of BWRVIP-01. No indications.
	2005 (RF10)	UT	In RF10, UT examinations of the H-3 and H-4 welds with the Tecnatom ID tool and H-6A and H-7 with the GE OD Tracker. H-4 and H-6A were two sided exams and H-3 and H-7 were one-sided exams. Shallow cracking was found in H-7. It was less than 10% of the inspected length of 67% of the weld.
Shroud Support (VIP-38)	1990 (RF2)	VT-3 & VT-1	In RF2, VT-3 of shroud support plate and VT-1 of the shroud support plate access hole cover. No indications.
	1996 (RF5)	VT-3 & VT-1	In RF5, VT-3 of shroud support plate and VT-1 of the shroud support plate access hole cover. No indications.
	1999 (RF7)	EVT-1	In RF7, baseline EVT-1 exams of the H-8 and H-9 were performed in accordance with BWRVIP-38. No Indications.
	2001 (RF8)	VT-1	In RF8, re-seating of jet pump no. 5 provided access to the H-10, H-11 and H-12 welds of the shroud support leg at 90 degrees and approximately 10 degrees of the underside of H-8 and H-9 so they were visually examined with at least VT-1 resolution. No indications.
	2007 (RF11)	EVT-1 & VT-1	In RF11, jet pump no. 6 was removed and re-seated due to excess leakage at the transition piece. While disassembled approximately 10 degrees of the underside of H-8 and H-9 were examined with at least VT-1 resolution. Also, the H-10, H-11 and H-12 welds of the shroud support legs at 90 and 120 degrees were examined with EVT-1 resolution. Coverage was approximately 35-50% for the welds of the 90 degree leg and 25% for the welds of the 120 degree leg.

TABLE 2 CONT.

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Top Guide (Rim, etc.) (VIP-26-A)	1989 (RF1)	VT-3	Top Guide periphery, including 90 studs and tack welds, examined in RF1. No indications.
	1994 (RF4)	VT-3	Top Guide Grid examined in RF4. No indications.
	1999 (RF7)	VT-1 & VT-3	In RF7, performed VT-3 of the Top Guide assembly in accordance with ASME Category B-N-2 and VT-1 of the studs and tack welds in accordance with BWRVIP-26. No indications.
	2005 (RF10)	VT-3	Code B-N-2 exam of accessible portions of Top Guide grid. Due to ID Core Shroud exams, a significant number of the grid cells were vacated and accessible for inspection. No indications.
Core Plate (Rim, etc.) (VIP-25; not applicable to BWR/6s)	1989 (RF1)	VT-3	Accessible core plate areas and fuel support castings examined in RF1. No indications.
	1994 (RF4)	VT-3	All of the hold down bolts examined from shroud interior in RF4. No indications.
	1999 (RF7)	VT-3	In RF7, performed VT-3 exam of the core plate areas made accessible by replacement of 5 Control Rod blades in accordance with ASME Category B-N-2. No indications.
CRD Guide Tube (VIP-47-A)	1999 (RF7)	VT-1 & EVT-1	In RF7, performed VT-1 of alignment pins and EVT-1 of the welds of 5 Control Rod Guide Tubes in accordance with BWRVIP-47. No indications.
	2001 (RF8)	VT-1 & EVT-1	In RF8, performed VT-1 of alignment pins and EVT-1 of the welds of an additional 4 Control Rod Guide Tubes in accordance with BWRVIP-47 to meet the 5% completion requirements of BWRVIP-47. No indications.
	2005 (RF10)	VT-1 & EVT-1	In RF10, performed VT-1 of alignment pins and EVT-1 of the welds of an additional 5 Control Rod Guide Tubes in accordance with BWRVIP-47. No indications.
	2007 (RF11)	VT-1 & EVT-1	In RF11, performed VT-1 of alignment pins and EVT-1 of the welds of an additional 4 Control Rod Guide Tubes in accordance with BWRVIP-47 to meet the 10% completion (i.e., 18 out of 177) requirements of BWRVIP-47. No indications.
Access Hole Cover (VIP-XX)	1996 (RF5)	VT-1	VT-1 examination of the access hole cover welds in accordance with SIL-409. No indications.
	2007 (RF11)	EVT-1	EVT-1 examination of the access hole cover welds in accordance with the draft BWRVIP AHC Inspection and Evaluation Guidelines. No indications.

IR-056 ATTACHMENT 1

COMPARISON OF CODE EXAMINATION REQUIREMENTS TO BWRVIP EXAMINATION REQUIREMENTS

The following discussion provides a comparison of the examination requirements provided in ASME Section XI, Examination Table IWB-2500-1, Item No. B13.40, to the examination requirements in the BWRVIP guidelines. Specific BWRVIP guidelines are provided as examples for comparisons. This comparison also includes a discussion of the examination methods.

Code Requirement - B13.40 - Core Support Structure (B-N-2)

The ASME Code requires a VT-3 examination of accessible surfaces of the integrally welded core support structure each 10-year interval. In a BWR/6 boiling water reactor, the welded core support structure has primarily been considered the shroud itself and the shroud support structure, including the shroud support plate (annulus floor) the shroud support ring, the shroud support welds, and the shroud support legs (if accessible). Historically, this requirement has been interpreted and satisfied differently across the industry. Category B-N-2 is titled, "Integrally Welded Core Support Structures and Interior Attachments to Reactor Vessels." However, since the title for Item No. B13.40 simply states, "Core Support Structure," some plants, including Perry, have also applied the examination requirements to other core support structures such as the Control Rod Guide Tubes, Core Plate and Top Guide assembly. The proposed alternate examinations replace this ASME requirement with specific BWRVIP guidelines that examine susceptible locations for known relevant degradation mechanisms.

- The Code requires a VT-3 of accessible surfaces each 10-year interval.

- The BWRVIP requires as a minimum the same examination method (VT-3) as the Code for integrally welded Core Support Structures, and for specific areas, requires either an enhanced visual examination technique (EVT-1) or ultrasonic examination (UT).

BWRVIP recommended examinations of core support structures are focused on the known susceptible areas of this structure, including the welds and associated weld heat affected zones. As a minimum, the same or superior visual examination technique is required for examination at the same frequency as the code examination requirements. In many locations, the BWRVIP guidelines require a volumetric examination of the susceptible welds at a frequency identical to the Code requirement.

The BWRVIP requires an EVT-1 or UT of core support structures. The core shroud and shroud support plate are used as examples for comparison between the Code and BWRVIP examination requirements as shown below.

Comparison to BWRVIP Requirements - BWR Core Shroud Examination and Flaw Evaluation Guidelines (BWRVIP-76)

- The Code requires a VT-3 examination of accessible surfaces every 10 years.
- BWRVIP-76 requires an EVT-1 examination from the inside and outside surface where accessible or UT examination of select circumferential welds, that have not been structurally replaced with a shroud repair, at a calculated "end of interval" (EOI) that will vary depending upon the amount of flaws present, but not to exceed ten years.

Comparison to BWRVIP Requirements - BWR Shroud Support Inspection and Flaw Evaluation Guidelines (BWRVIP-38)

- The Code requires a VT-3 examination of accessible surfaces every 10 years.
- The BWRVIP requires examinations of the support plate to shroud weld (H8) and support plate to reactor vessel weld (H9). Examination coverage is required to be (100% - Flaw Tolerance) or 10% of the weld length, whichever is greater. Examinations are to be performed by EVT-1 or UT from the annulus or UT from the RPV outside surface. Reinspection depends upon the amount of flaws present, but not to exceed six years for EVT-1 or ten years for UT.

In summary, the BWRVIP recommended examinations specify locations that are known to be vulnerable to BWR relevant degradation mechanisms rather than "all surfaces". The BWRVIP examination methods (EVT-1 or UT) are superior to the Code required VT-3 for flaw detection and characterization. The BWRVIP examination frequency is equivalent to or more frequent than the examination frequency required by the Code. The superior flaw detection and characterization capability, with an equivalent or more frequent examination frequency and the comparable flaw evaluation criteria, results in the BWRVIP criteria providing a level of quality and safety equivalent to or superior to that provided by the Code requirements.

Enclosure 4
L-08-066

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST No. IR-057, Rev 0

Relief Request
in Accordance with 10 CFR 50.55a(g)(5)(iii)

1. Identification of Components

ASME Section XI, Table IWB-2500-1, Examination Category B-A (Pressure Retaining Welds in Reactor Vessel), Item No. B1.30 (Shell-to-Flange Weld), identified as follows:

ISI Exam ID	Description
1B13-AE	Number 4 Shell Ring to RPV Shell Flange Circumferential Seam Weld

2. Applicable Code Edition and Addenda

Perry is currently in its second 10-year inspection interval and complies with the 1989 Edition of ASME XI.

3. Applicable Code Requirements

Table IWB-2500-1, Category B-A, Item No. B1.30 requires that essentially 100% of the Reactor Pressure Vessel (RPV) shell-to-flange weld examination volume, as defined by Figure IWB-2500-4, be examined. Per Sub-Article I-2100, the ultrasonic examination of the RPV welds is to be conducted in accordance with Article 4 of Section V as supplemented by Table I-2000-1.

4. Impracticality of Compliance

This weld was examined in Refuel Outage 10 (2005), and 100% coverage could not be obtained. Composite coverage was calculated as approximately 68% (refer to Figures 1 and 2 for coverage plots and calculations). It is impractical to obtain significantly more coverage than achieved due to the limitations presented by the flange side geometry and interference from the flange leak-off drain line. Examinations were performed from the outside diameter of the RPV shell as follows:

- No scans were performed from the flange side of the weld.
- From the shell side, scans for axially oriented flaws (i.e., parallel scans) were limited to about 58.4% of the required volume.
- From the shell side, scans for circumferentially oriented flaws (i.e., transverse scans) were performed from one beam direction providing about 76.8% coverage of the required volume.

- In order to achieve more credible one-sided coverage of the weld, and in accordance with IWA-2240, in lieu of Section V, Article 4 ultrasonic examinations, the examinations were performed using Section XI, Appendix VIII, Supplement 4 and 6 procedures and personnel that were qualified for single-side examination.

5. Burden Caused by Compliance:

   Compliance would require replacement of the RPV with a RPV fabricated with a special design to allow for full examination of the flange.

6. Proposed Alternative and Basis for Use

   Adequate coverage for circumferential flaws was obtained with acceptable examination results to assure that the structural integrity of the flange is being maintained. The weld also receives a VT-2 examination each refueling outage. Additionally, during operations, Reactor Coolant System (RCS) unidentified leakage within the drywell is monitored, with a Technical Specifications (TS) limit of 5 gpm. As stated in Perry's TS Bases, the 5 gpm limit is a small fraction of the calculated flow from a critical crack in the primary system piping. Therefore, relief is requested from obtaining 100% coverage of the required examination volume per 10 CFR 50.55a(g)(5)(iii).

7. Duration of Proposed Alternative

   Upon approval by the NRC Staff, this relief request will be utilized through the remainder of Perry's second 10-year inspection interval (November 18, 1998 – May 17, 2009; with the current 10-year inspection interval being extended by 6-months in accordance with IWA-2430(d)).

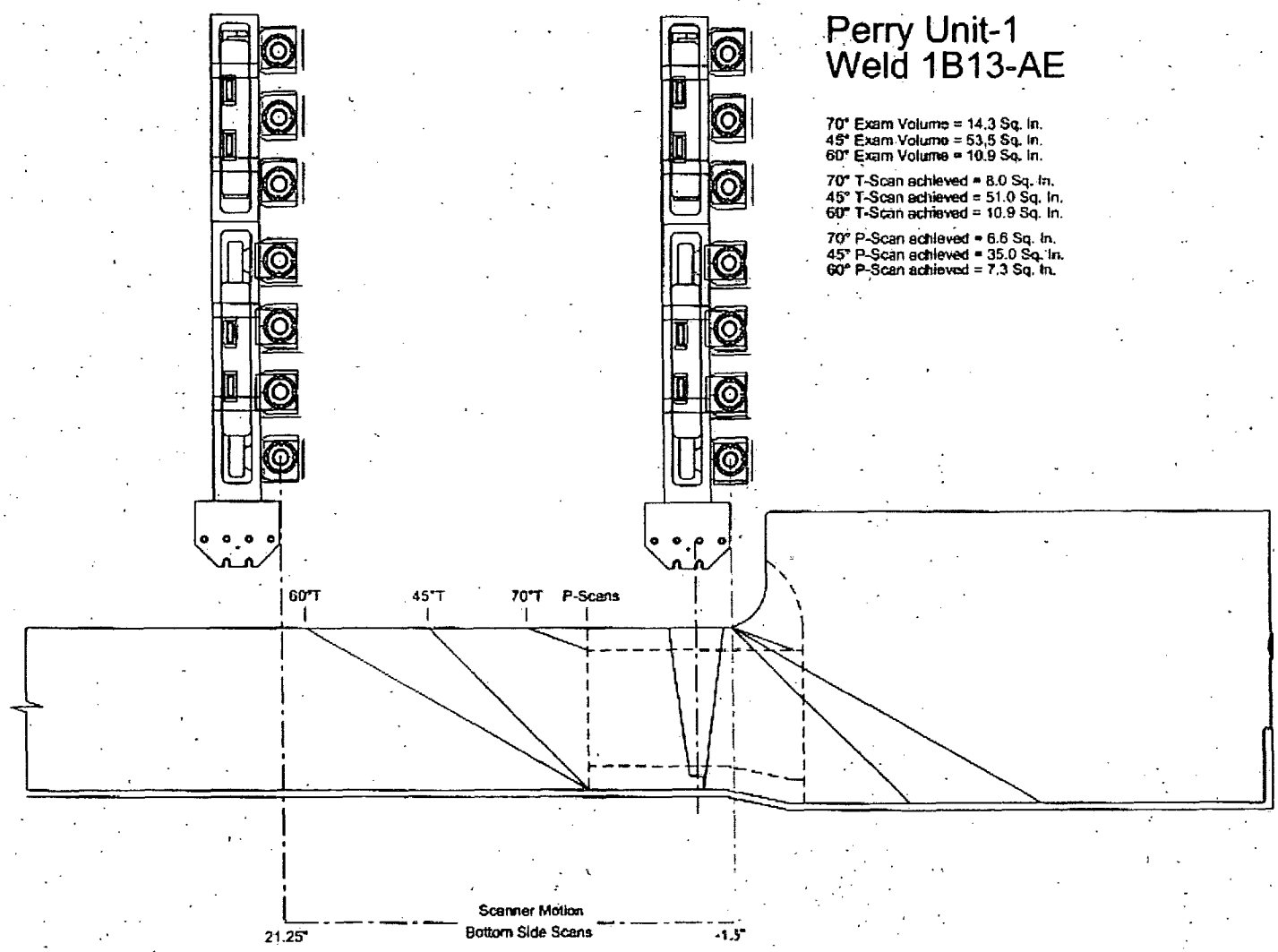
8. Precedents

   A similar relief request was approved for the Edwin I. Hatch Nuclear Power Station as RR-61, which is listed within Reference 2.

9. References

1. ASME Boiler and Pressure Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants," 1989 Edition with no Addenda.

2. Letter from U. S. Nuclear Regulatory Commission (USNRC) to Southern Nuclear Operation Company, "Edwin I. Hatch Nuclear Plant, Unit Nos. 1 and 2, Evaluation of Third 10-Year Interval Inservice Inspection Program Plan Request for Relief Nos. RR-46, RR-48, RR-49, RR-50, RR-52, RR-53, RR-54, RR-55, RR-56, RR-57 and RR-61" (ADAMS ML071830010), dated July 20, 2007.



IR-057 Figure 1
Shell-to-Flange Weld 1B13-AE Coverage Plot

Perry Unit-1
1B13-AE

Weld Length = 801.5 Exam Volume = 78.7		CODE CROSS-SECTIONAL AREA Required Exam Area Sq. In.	 Area Scanned Auto	 Percent of Area Auto	LENGTH CALCULATIONS Weld Length Auto	 Percent Auto
70° T-Scan	A	14.3	8.0	10.2%	752.25	4.8%
45° T-Scan	A	53.5	51.0	64.8%	752.25	30.4%
60° T-Scan	A	10.9	10.9	13.9%	752.25	3.2%
70° P-Scan	A	14.3	6.6	8.4%	752.25	3.9%
45° P-Scan	A	53.5	35.0	44.5%	752.25	20.9%
60° P-Scan	A	10.9	7.3	9.3%	752.25	4.4%
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
70° T-Scan						
45° T-Scan						
60° T-Scan						
70° P-Scan						
45° P-Scan						
60° P-Scan						
				% Total Composite Coverage =		67.6%

Composite transverse Coverage 76.8%

Composite Parallel Coverage 58.4%

Comments: A - Exam was restricted due to the proximity of the RPV flange and the N17 nozzle drain line.

Note - Rounding methods may affect calculated values.

IR-057 Figure 2
Shell-to-Flange Weld 1B13-AE Coverage Calculations