

Power Generation Group

Perry Nuclear Power Plant
10 Center Road
Perry, Ohio 44081

Mail Address:
P.O. Box 97
Perry, OH 44081

216-280-5915
FAX: 216-280-8029

Lew W. Myers
Vice President

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PY-CEI/NRR-2136L

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
Response to Request for Additional Information - Inservice Inspection Program, Perry Nuclear Power Plant, Unit No. 1

Ladies and Gentlemen:

Requests for relief from the American Society of Mechanical Engineers (ASME) Code, Section XI requirements were submitted to the Nuclear Regulatory Commission (NRC) for the Perry Nuclear Power Plant (PNPP), Unit 1, Inservice Examination Program (ISEP), in a letter dated June 28, 1996 (PY-CEI/NRR-2068L). In a request for additional information (RAI) dated January 15, 1997 (TAC No. M95898), the NRC staff indicated that an initial review of the submittal had been performed, and additional information is needed to complete the review. The NRC requested that the specific paragraph of the Regulations (10 CFR 50.55a) under which the request was submitted, along with supporting justification, be provided. In addition, the NRC requested a more detailed description of the burden associated with removing jet impingement shields.

Attachment 1 to this letter provides the detailed response to the RAI for PNPP. Attachments 2 and 3 provide the revised relief requests.

In addition, NRC approval to use ASME Code Cases N-498-1, N-522, and N-546, as alternatives to the ASME Section XI Code requirements at PNPP (TAC No. M97694) was requested in a letter dated January 7, 1997 (PY-CEI/NRR-2125L). The detailed relief requests applying these code cases were identified as PT-004, PT-005, and PT-006. However, during the review of the subject RAI, it was noted that only PT-005 identified the applicable section of the Code of Federal Regulations under which the relief request was being submitted. Consequently, relief requests PT-004 and PT-006 (Attachment 4 and Attachment 5) have been revised to reference the applicable section of the Code of Federal Regulations. As stated in the letter dated January 7, 1997, approval of the use of the Code Cases at PNPP is requested by April 15, 1997, so that planning for the sixth refueling outage, presently scheduled to begin in September 1997, may proceed with this consideration.

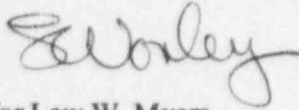
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If you have questions or require additional information, please contact Mr. Henry L. Hegrat,
Manager - Regulatory Affairs, at (216) 280-5606.

Very truly yours,

A handwritten signature in cursive script, appearing to read "L. W. Myers".

for Lew W. Myers

KMN:sc

Attachments

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III
Authorized Nuclear Inservice Inspector
Michael T. Anderson, INEL Research Center
Ohio Department of Industrial Relations

Background

Requests for relief from the American Society of Mechanical Engineers (ASME) Code, Section XI requirements were submitted to the Nuclear Regulatory Commission (NRC) for the Perry Nuclear Power Plant (PNPP), Unit 1, Inservice Examination Program (ISEP), in a letter dated June 28, 1996 (PY-CEI/NRR-2068L). In a request for additional information (RAI) dated January 15, 1997 (TAC No. M95898), the NRC staff indicated that an initial review of the submittal had been performed, and additional information is needed to complete the review. The NRC requested that the specific paragraph of the Regulations (10 CFR 50.55a) under which the request was submitted, along with supporting justification, be provided. In addition, the NRC requested a more detailed description of the burden associated with removing jet impingement shields. The response to the RAI is provided below.

NRC Question A

Requests for Relief IR-028 and IR-029 were submitted without reference to an applicable section of the Code of Federal Regulations as discussed above. Without this reference, the requests cannot be evaluated. Provide the appropriate reference to the Code of Federal Regulations along with the documentation necessary to support the regulatory basis.

PNPP Response to Question A

Relief Requests IR-028 and IR-029 for the PNPP ISEP were submitted for NRC review pursuant to 10 CFR 50.55a(a)(3)(ii). These relief requests have been revised to incorporate the appropriate reference to the Code of Federal Regulations. Attachment 2 and Attachment 3 to this letter provide the revised relief requests, as well as the information necessary to support the regulatory basis.

NRC Question B

In Request for Relief IR-029, access to the subject welds is obstructed by jet impingement shields. However, the burden associated with removing the shields has not been adequately described. Are the jet impingement shields bolted or welded? Provide a more detailed description of the jet impingement shields and the burden associated with removing the shields.

PNPP Response to Question B

The jet impingement shields are elbow or tee-shaped structural steel enclosures around recirculation piping header and riser welds. The jet impingement shields weigh over 1600 lbs and are assembled with 48 high strength, one time use, bolts that are tensioned to 10-16 kips. Disassembly for inspection, and subsequent reassembly, is a labor intensive effort that requires over 100 man-hours. Dose rates for the recirculation header piping, in the areas of the shields, range from 200-400 millirem/hr on contact. Thus, removal of each shield results in a dose of approximately 3 rem. Relief Request IR-029 (Attachment 3) has been revised to include this description.

Regulatory Commitments

The following table identifies those actions which are considered to be regulatory commitments. Any other actions discussed in this document represent intended or planned actions, are described for the NRC's information, and are not regulatory commitments. Please notify the Manager - Regulatory Affairs at the Perry Nuclear Power Plant of any questions regarding this document or any associated regulatory commitments.

Commitments

There are no commitments in this letter.

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST #IR-028

I. Identification of Components

Class 1, Category B-M-2, Item number B12.50, valve body, exceeding NPS 4 (see attached table for weld ID numbers).

II. ASME B&PV Section XI Requirements

Table IWB-2500-1 requires a VT-3 of the internal surfaces of 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 and system overpressurization protection).

III. Relief Requested

In accordance with the above requirements, Perry's Inservice Examination Program identifies 23 valve groupings for Class 1 valves, of which 21 exceed NPS 4. Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from examining a valve from 9 groupings in which no valves were disassembled for maintenance, repair, or modification during the first inspection interval.

IV. Basis for Relief

The structural integrity of the valves was demonstrated during construction by meeting the requirements of the ASME Code Section III.

The pressure boundary passed the required hydrostatic test, and has operated for a total of about 2006 equivalent full power days between November 1987 and February 1996, without any leakage indication attributable to the Code boundary of the subject valves.

12 valves, whose interiors were made accessible for examination by maintenance, repair, or modification activities were examined with satisfactory results. Although not of the same groupings, the examined valves are similar in design and function to the unexamined valves.

The disassembly of valves solely for the purpose of examination of interior surfaces is impractical in that it is a significant burden without any accompanying increase in overall plant safety. This is recognized by the ASME Code Committee's removal of this requirement from Section XI in the 1989 Edition and the NRC's current endorsement of the 1989 Edition in 10CFR50.55a(g).

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST #IR-028

In summary, because of acceptable initial condition, successful Code hydrotest and operating experience without related leakage indications, satisfactory examination results for the examined valves, and NRC endorsement of the 1989 Edition which no longer requires disassembly solely for examination, it is concluded that there is no significant impact on the overall level of plant quality and safety.

V. Alternate Examination

None. Currently there are no maintenance, repair or modification activities planned for the subject (i.e., selected) valves, or any other valves within the 9 groupings, within the remainder of the first interval. However, should access be provided to the interiors of any of the valves within these groupings by emergent maintenance, repair or modification activities prior to the end of the first interval, they will be examined as required.

Perry Nuclear Power Plant Unit 1
 RELIEF REQUEST #IR-028

<u>VALVE NUMBER</u>	<u>SYSTEM/ ISI ISO SS-305-</u>	<u>DESCRIPTION</u>	<u>ISEP VALVE GROUPING</u>
1B33-F023B	RR/602-104	22" GATE VALVE	V
1E12-F023	RHR/642-122	6" GLOBE VALVE	XV
1E12-F042A	RHR/642-126	12" FORGED GATE VALVE	XII
1E21-F005	LPCS/705-108	12" FORGED GATE VALVE	XVI
1E21-F006	LPCS/705-111	12" CHECK VALVE	XVII
1E22-F036	HPCS/701-111	12" FORGED GATE VALVE	XVIII
1E51-F064	RCIC/632-102	10" FORGED GATE VALVE	XXII
1G33-F004	RWCU/671-104	6" FORGED GATE VALVE	VIII
1N27-F560A	FW/082-102	20" GATE VALVE	III

Note: The valves identified above are those selected for examination within Perry's Inservice Examination Program (ISEP) for their valve groupings. In practice, when access is first provided to any valve within a grouping, that valve is examined as required and the ISEP is revised to reflect selection of the examined valve for its grouping.

RR = REACTOR RECIRCULATION
 RHR = RESIDUAL HEAT REMOVAL
 LPCS = LOW PRESSURE CORE SPRAY
 HPCS = HIGH PRESSURE CORE SPRAY
 RCIC = REACTOR CORE ISOLATION COOLING
 RWCU = REACTOR WATER CLEANUP
 FW = FEEDWATER

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST #IR-029

I. Identification of Components

Class 1, Category B-J (Item numbers in attached table), piping welds 4 inches NPS and greater.

II. ASME B&PV Section XI Requirements

Table IWB-2500-1 requires 100% surface and volumetric examination of 25% of the circumferential butt welds and their intersecting longitudinal welds. In accordance with Category B-J Note 1 of the Table, the examinations are to include all terminal ends, joints where the seismic and operational load stress levels exceed primary plus secondary stress intensity range of $2.4S_m$ (i.e., "high stress" location) or a cumulative usage factor U of 0.4 (i.e., "high fatigue" location), all dissimilar metal welds, and additional welds (if necessary) such that the total number of circumferential butt welds equals 25%.

III. Relief Requested

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from selecting the welds in accordance with Note 1 when structural interferences make such selection impractical, at the first and subsequent examinations as scheduled in Section 2.6 of the ISEP.

IV. Basis for Relief

The welds identified in the attached table are "high stress" welds, but examination is impractical as they are in high radiation areas and are encased in jet impingement shields. The jet impingement shields are elbow or tee-shaped structural steel enclosures around recirculation piping header and riser welds. The jet impingement shields weigh over 1600 lbs and are assembled with 48 high strength, one time use, bolts that are tensioned to 10-16 kips. Disassembly for inspection, and subsequent reassembly, is a labor intensive effort that requires over 100 man-hours. Dose rates for the recirculation header piping, in the areas of the shields, range from 200-400 millirem/hr on contact. Thus, removal of each shield results in a dose of approximately 3 rem.

The structural integrity of the piping pressure boundary was demonstrated during construction by meeting the requirements of the ASME Code Section III, and additionally by meeting the requirements of ASME Section XI during preservice inspections. The subject welds were examined (prior to installation of the jet impingement shields) 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. There were no reportable indications during preservice inspection.

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST #IR-029

The pressure boundary passed the required preservice hydrostatic test and first period inservice system pressure tests, and has operated for a total of about 2006 equivalent full power days between November 1987 and February 1996 without leakage indication attributable to the subject welds.

Complete examinations meeting the requirements of the ASME Code Section XI have been performed on identical "high stress" welds within the Reactor Recirculation System where jet impingement shields are not present or are easily removed, with satisfactory results. These welds are subject to the same operating and environmental conditions as the obstructed welds.

Other Reactor Recirculation System welds of the same size and configuration, but that are not "high stress" welds, will be examined in place of the obstructed welds. In accordance with ASME Research White Paper, "Risk-Based Alternative Selection Process for Inservice Inspection of LWR Nuclear Power Plant Components," (Library of Congress Catalog Number 94-71660) a recent industry survey, which included 50 nuclear units representing 733 cumulative years of operation, found that there is no apparent relationship between the type of welds selected for inspection (i.e., high design stress/fatigue welds versus low stress/fatigue welds) and the detection of flaws.

Design, procurement and operational provisions against nil ductile failure of the subject welds remain as described in the Perry USAR.

In summary, because of the dose burden, acceptable initial condition, successful Code hydrotest and operating experience without related leakage indications, the satisfactory examination of identical welds, the substitution of welds of similar size and configuration, and protection against brittle failure, it is concluded that there is no significant impact on the overall level of plant quality and safety.

V. Alternate Examination

None. However, welds of the same size and similar configuration, but that are not "high stress" welds, will be examined in place of the obstructed welds to maintain the 25% selection requirement.

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST #IR-029

<u>ITEM NO.</u>	<u>COMPONENT I.D.</u>	<u>SYS./DWG. NO.</u>	<u>DESCRIPTION</u>	<u>NATURE OF OBSTRUCTION</u>	<u>% COMPLETE</u>
B9.11	1B33-0029 (1B33-0028)	RR/602-101	16" PIPE TO 12" x 16" SWEEPOLET, CRC (16" PIPE TO 12" x 16" SWEEPOLET, CRC)	JET IMPINGEMENT SHIELD RBRAD8	0%
B9.11	1B33-0032 (1B33-0090)	RR/602-101	16" PIPE TO 12" x 16" SWEEPOLET, CRC (16" PIPE TO 12" x 16" SWEEPOLET, CRC)	JET IMPINGEMENT SHIELD RBRAD7	0%
B9.11 B9.12	1B33-0043 1B33-0043-U (1B33-0046) (1B33-0046-D)	RR/602-101	12" PIPE TO NOZZLE SAFE-END, CRC; AND UPSTREAM LONGSEAM (12" PIPE TO 12" x 24" REDUCER, CRC; AND DOWNSTREAM LONGSEAM)	JET IMPINGEMENT SHIELD RBRAD4	0%

Note: Welds in parentheses are the non "high stress" welds to be substituted for the obstructed "high stress" welds.

RR = REACTOR RECIRCULATION SYSTEM
CRC = CORROSION RESISTANT CLAD WELD

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST No. PT-004
Code Case N-498-1

I. Identification of Components

Class 1, 2, and 3 systems subject to hydrostatic testing.

II. ASME Boiler & Pressure Vessel Code Section XI Requirements

Hydrostatic pressure tests per the 1983 Edition through Summer 1983 Addenda of Section XI, Table IWB-2500-1, Table IWC-2500-1, and Table IWD-2500-1.

III. Relief Requested

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from performing the Code-required hydrostatic tests. Alternative examinations are proposed.

IV. Basis for Relief

ASME Section XI requires hydrostatic testing of Class 1, 2, and 3 systems to be performed at the end of each 10-year inservice inspection interval. The use of Code Case N-498, "Alternative Rules for 10-Year System Hydrostatic Testing for Class 1 and 2 Systems," was previously approved by the NRC in Regulatory Guide 1.147, Revision 11. The N-498-1 alternative requirements for Code Class 1 and 2 are unchanged from N-498; Code Case N-498-1 expands the scope of Code Case N-498 to include Class 3 systems.

The Cleveland Electric Illuminating Company (CEI) has determined that hydrostatic tests represent a hardship with little benefit. Hardships are generally encountered with the performance of hydrostatic testing in accordance with the Code. Because hydrostatic test pressure is higher than the nominal operating pressure, hydrostatic pressure testing frequently requires significant effort to set up and perform. The preparation for the performance of the 10-year system hydrostatic tests involves considerable time and radiation dose with little or no compensating increase in the level of quality or safety.

The ASME Subcommittee Working Group on Pressure Testing concluded that no additional benefit is gained by conducting the existing system hydrostatic tests in place of the alternate requirements which require a system leakage test at the nominal operating pressure. The conclusion of the group was that Section XI hydrostatic testing does not verify structural integrity and could result in extended outages and increased costs.

Industry experience has demonstrated that in-service leaks are not discovered as a result of hydrostatic pressures propagating an existing flaw throughwall. The experience

indicates that, in most cases, leaks are being found when the system is at normal operating pressure.

V. Alternate Examination

CEI proposes to perform the alternative examination delineated in Code Case N-498-1 as an option to performing the Code-required hydrostatic tests. Code Case N-498-1 expands the scope of N-498 to include Class 3 systems. For Class 3 systems, in lieu of the 10-year system hydrostatic test required by ASME Section XI (Division 1) Table IWD-2500-1, Code Case N-498-1 allows the alternative requirements summarized as follows:

1. A system pressure test shall be conducted at or near the end of each inspection interval.
2. The test boundary shall extend to all Class 3 components included in those portions of systems required to operate or support the safety function up to and including the first normally closed isolation valve (including a safety or relief valve) or valve capable of automatic closure when the safety function is required.
3. A VT-2 visual examination shall be performed with the system maintained at nominal operating pressure. The system shall be pressurized for at least 4 hours for insulated systems and 10 minutes for noninsulated systems, prior to performing the VT-2 visual examination.
4. The VT-2 visual examination shall include all components within the boundary identified in (2) above.
5. The test instrument requirements of IWA-5260 are not applicable.

Perry Nuclear Power Plant Unit 1
RELIEF REQUEST No. PT-006
Code Case N-546

I. Identification of Components

Class 1, 2, and 3 systems subject to pressure testing.

II. ASME Boiler & Pressure Vessel Code Section XI Requirements

Tables IWB-2500-1, IWC-2500-1 and IWD-2500-1 of the 1983 Edition through Summer 1983 Addenda of Section XI require the VT-2 examination method for pressure testing. IWA-2300(c) requires that personnel performing the VT-2 visual examinations be qualified by the Owner or the Owner's agent in accordance with the comparable levels of competency as defined in ANSI N45.2.6-1973. Perry further utilizes Code Case N-448, "Qualification of VT-2 and VT-3 Visual Examination Personnel, Section XI, Division 1," which reflects later editions of IWA-2300 that require personnel performing visual examination to be qualified and certified to comparable levels of qualification as defined in SNT-TC-1A and the Employers written practice.

III. Relief Requested

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested from requiring that the personnel performing the VT-2 examinations be qualified and certified to comparable levels of qualification as defined in SNT-TC-1A.

IV. Basis for Relief

The use of Code Case N-546 will eliminate the need to treat VT-2 examination personnel as NDE personnel. The Abstract of SNT-TC-1A states, "This standard applies to personnel whose specific tasks or jobs require appropriate knowledge of the technical principals underlying nondestructive testing (NDT) methods for which they have responsibilities within the scope of VT-1 and VT-3 examination methods, VT-2 requires no special knowledge of technical principals underlying its performance. It is simply the straight forward examination for leakage. No special skills or technical training are required in order to observe water dripping from a component or bubbles forming on a joint wetted with leak detection solution. As such, qualification in accordance with the provisions of the Code Case does not present any reduction in quality or safety. In fact, it will facilitate the qualification of those personnel most familiar with the walkdown of plant systems.

Additionally, there is a cost benefit of approximately \$12,000 per operating cycle realized by eliminating the formal certification of Perry and contracted VT-2 examination personnel.

In summary, approval of this request would be in accordance 10 CFR 50.55a(a)(3)(i) as compliance with Code Case N-546 will provide an essentially equivalent alternative to the IWA-2300 requirements. It would also provide relief from the administrative and financial burdens of certification, which do not provide any compensating increase in the level of quality or safety.

V. Alternate Examination

CEI proposes to perform VT-2 examinations utilizing personnel qualified in accordance with the provisions of Code Case N-546 in lieu of personnel who are qualified and certified to comparable levels of qualification as defined in SNT-TC-1A. The qualification provisions specified in Code Case N-546 are as follows:

1. Personnel must have at least 40 hours of plant walkdown experience, such as that gained by licensed and nonlicensed operators, local leak rate personnel, system engineers, and inspection and nondestructive examination personnel
2. Personnel must receive at least 4 hours of training on Section XI requirements and plant specific procedures for VT-2 examination
3. Personnel must meet the vision test requirements of IWA-2321, 1995 Edition.