IDAHO NATIONAL ENGINEERING LABORATORY
TECHNICAL EVALUATION REPORT ON THE
THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN:
AND ASSOCIATED AND REQUEST FOR RELIEF FOR
COMMONWEALTH EDISON COMPANY,
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3,
DOCKET NUMBERS 50-237 AND 50-249

1. INTRODUCTION

Throughout the service life of a water-cooled nuclear power facility, 10 CFR 50.55a(g)(4) (Reference 1) requires that components (including supports) that are classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, Class 2, and Class 3 meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components* (Reference 2), to the extent practical within the limitations of design, geometry, and materials of construction of the components. This section of the regulations also requires that inservice examinations of components and system pressure tests conducted during successive 120-month inspection intervals comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet requirements set forth in subsequent editions and addenda of this Code that are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein. The licensee, Commonwealth Edison Company, has prepared the *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection (ISI) Program Plan* to meet the requirements of the 1989 Edition of the ASME Code Section XI. The Third 10-year Interval began March 1, 1992 and ends February 28, 2002.

As required by 10 CFR 50.55a(g)(5), if the licensee determines that certain Code examination requirements are impractical and requests relief from them, the licensee shall submit information and justification to the Nuclear Regulatory Commission (NRC) to support that determination.

Pursuant to 10 CFR 50.55a(g)(6), the NRC will evaluate the licensee's determination that Code requirements are impractical to implement. The NRC may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Alternatively, pursuant to 10 CFR 50.55a(a)(3), the NRC will evaluate the licensee's determination that either (i) the proposed alternatives provide an acceptable level of quality and safety, or (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety. Proposed alternatives may be used when authorized by the NRC.

The information in the *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval ISI Program Plan*, Revision 0 (Reference 3), submitted February 18, 1992, was reviewed, including the requests for relief from the ASME Code Section XI requirements that the licensee has determined to be impractical. The review of the ISI Program Plan was performed using the Standard Review Plans of NUREG-0800 (Reference 4), Section 5.2.4, "Reactor Coolant Boundary Inservice Inspections and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components."

In a letter dated October 6, 1992 (Reference 5), the NRC requested additional information that was required to complete the review of the ISI Program Plan. The licensee provided the requested information and Revision 1 to the ISI Program Plan in a submittal dated December 4, 1992 (Reference 6). In Revision 1, as a result of the RAI, the licensee withdrew Relief Requests CR-11, CR-13, and PR-15, revised Relief Requests CR-04, CR-06, CR-07, CR-09, and CR-10, and submitted Relief Request CR-16. Additional information was required for Revision 1, and a second RAI, dated June 23, 1993 (Reference 7), was issued. The requested information was provided by the licensee in a submittal dated August 13, 1993 (Reference 8). In this response, the licensee submitted Revision 2 to the Third 10-Year ISI Program Plan (Reference 9), withdrew Relief Request CR-07, and revised Relief Requests CR-01, CR-02, CR-03, and PR-11.

The *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval ISI Program Plan*, through Revision 2, is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous reviews.

The requests for relief are evaluated in Section 3 of this report. Unless otherwise stated, references to the Code refer to the ASME Code, Section XI, 1989 Edition. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

The applicable program documents were reviewed to determine whether or not they are in compliance with the Code requirements and any previous license conditions pertinent to ISI activities. This section describes the documents reviewed and the results of the review.

2.1 Documents Evaluated

Review has been completed on the following information from the licensee:

(a) *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted February 18, 1992 (Reference 3);

(b) The response to the NRC request for additional information and the *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 1, submitted December 4, 1992 (Reference 6);

(c) The response to the NRC request for additional information dated August 18, 1993 (Reference 8); and

(d) *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 2, submitted August 13, 1993 (Reference 9).

2.2 Compliance with Code Requirements

2.2.1 Compliance with Applicable Code Editions

The Inservice Inspection Program Plan shall be based on the Code editions defined in 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(b). Based on the interval starting date of March 1, 1992, the Code applicable to the third interval ISI program is the 1986 Edition. However, as stated in Section 1 of this report, the licensee has prepared the *Dresden Nuclear Power Station, Units 2 and 3 Third 10-Year ISI Program Plan* to meet the requirements of the 1989 Edition of the Code. The use of the 1989 Edition as the basis for the development of the program was found to be acceptable by the Office of Nuclear Reactor Regulation (NRR) by letter dated January 28, 1992 (Reference 10).

2.2.2 Acceptability of the Examination Sample

Inservice volumetric, surface, and visual examinations shall be performed on ASME Code Class 1, 2, and 3 components and their supports using sampling schedules described in Section XI of the ASME Code and 10 CFR 50.55a(b).

Regulatory Guide (RG) 1.26, *Quality Group Classification and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants* (Reference 11), provides the criteria for the classification of Class 2 and 3 systems. Paragraph C.1.c of RG 1.26 states that Group B (Class 2) quality standards should be applied to:

> "Those portions of the steam systems of boiling water reactors extending from the outermost containment isolation valve up to but not including the turbine stop and bypass valves and connected piping up to and including the first valve that is either normally closed or capable of automatic closure during all modes of normal reactor operation. Alternately, for boiling water reactors containing a shutoff valve (in addition to the two containment isolation valves) in the main steam line and in the main feedwater line, Group B quality standards should be applied to those portions of the steam and feedwater systems extending from the outermost containment isolation valves up to and including the shutoff valve or the first valve that is either normally closed or capable of automatic closure during all modes of normal operation."

Additional clarification can be found in USNRC Standard Review Plan 3.2.2 (Reference 4), Appendix A, *Classification of Main Steam Components Other Than the Reactor Coolant Pressure Boundary for BWR Plants*, which states that the main steam line from the second isolation valve to the turbine stop valve and the main turbine bypass line to the bypass valve should be Quality Group B.

In the licensee's Program, the portions of the main steam system from the outboard isolation valves are shown as non-classed. In accordance with RG 1.26 and Standard Review Plan 3.2.2, the subject portions of the main steam system to the turbine stop and bypass valves should receive surface and volumetric examinations as required by Subsection IWC of ASME Section XI.

Similarly, the Class 1 residual heat removal (RHR) piping that feeds the RPV head spray (Drawing ISI-127) is identified as non-classed. Paragraph C.1.b of RG 1.26 states that Group B quality standards should also be applied to:

> "Systems or portions of systems important to safety that are designed for (1) reactor shutdown or (2) residual heat removal."

Excluding the subject portions of the main steam and residual heat removal systems from Class 2 volumetric and surface examinations does not meet the intent of RG 1.26 and should be considered unacceptable. Therefore, examination sample size and weld selection have not been implemented in accordance with the Code and 10 CFR 50.55a(b).

2.2.3 Exemption Criteria

The criteria used to exempt components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exemption criteria have been applied by the licensee in accordance with the Code as discussed in the ISI Program Plan and appear to be correct.

2.2.4 Augmented Examination Commitments

In addition to the requirements in Section XI of the ASME Code, the licensee has committed to perform augmented examinations as described below.

(a) The examinations specified in NRC Generic Letter 88-01, *NRC Position on Intergranular Stress Corrosion Cracking in BWR Austenitic Stainless Steel Piping* (Reference 12), and NUREG-0313, Revision 2, *Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping* (Reference 13) will be performed.

(b) The inner radius and bore of the Feedwater nozzles, along with the nozzle-to-vessel weld, safe end-to-nozzle weld, and the pipe-to-safe end weld are currently ultrasonically examined every other refuel outage as required by NUREG-0619, *BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking* (Reference 14). Visual examination of the spargers from the vessel I.D. is performed at least every fourth refuel outage. Liquid penetrant examination of the nozzle bores is scheduled for the ninth refuel outage following the sparger replacement.

(c) The requirements of NRC Regulatory Guide 1.150, *Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations*, (Reference 15) have been incorporated into procedure NDT-C-30 (Ultrasonic Inspection of Reactor Vessel Welds to NRC Reg. Guide 1.150 at Nuclear Power Stations).

(d) All twenty jet pump beam assemblies undergo ultrasonic and visual examinations each refuel outage per NUREG/CR-3052, *BWR Jet Pump Assembly Failure* (Reference 16).

2.3 Conclusions

Based on the review of the documents listed above, the *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval ISI Program Plan*, Revision 2, showed compliance with the Code, except for the items discussed in paragraph 2.2.2. The licensee should review these items and make changes to the ISI Program, where appropriate.

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements that the licensee has determined to be impractical for the third 10-year inspection interval are evaluated in the following sections.

3.1 Class 1 Components

3.1.1 Reactor Pressure Vessel

3.1.1.1 Request for Relief No. CR-01, Examination Category B-D, Item B3.100, Standby Liquid Control Nozzle Inner Radius

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.100 requires a 100% volumetric examination of all reactor vessel nozzle inner radius sections each inspection interval as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination of standby liquid control nozzle inner radius section N12-1 for Units 2 and 3.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The standby liquid control (SBLC) nozzle is designed with an integral socket to which the boron injection piping is fillet welded. The SBLC nozzle is located near the bottom of the vessel in an area that is inaccessible for ultrasonic examinations from inside of the vessel. Therefore, ultrasonic examination would need to be performed from the outside of the vessel. The ultrasonic scan would need to travel through the full thickness of the vessel into a complex cladding/socket configuration. The geometric and material reflectors inherent in this design prevent a meaningful examination from being performed on the nozzle inner radius of the SBLC nozzle.

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

Licensee's Proposed Examination: The Code-required VT-2 visual examination will be performed each refueling outage in conjunction with the system leakage test.

Evaluation: The Code requires that all reactor vessel nozzle inner radius sections receive volumetric examination each inspection interval. Figure CR-01.1, furnished with the submittal, showed the cladding/socket configuration described in the Basis for Relief above. The integral socket design of the SBLC nozzle makes the Code-required examination impractical to perform at Dresden Station, Units 2 and 3. To perform the required volumetric examination, the nozzle would have to be redesigned and replaced. The VT-2 visual examination performed every refueling outage in conjunction with the Class 1 system leakage test will detect any leakage that may occur. Corrective action taken as a result of findings will provide a reasonable assurance of operational readiness.

Conclusion: The Code-required volumetric examination of the SBLC nozzle inner radius is impractical to perform due to the component design. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.1.2 Request for Relief No. CR-07, Examination Category B-H, Item B8.10, Reactor Vessel (RPV) Support Skirt to RPV Bottom Head Weld

NOTE: In the August 13, 1993 response to the NRC's request for additional information, the licensee withdrew Relief Request No. CR-07.

3.1.1.3 Request for Relief No. CR-13, Examination Category B-G-1, Item B6.10, Use of 1989 Addenda for RPV Closure Head Nuts

NOTE: In the December 4, 1992 response to the NRC's request for additional information, the licensee withdrew Relief Request No. CR-13 pending approval of the 1989 Addenda.

3.1.2 Pressurizer (Does not apply to BWRs)

3.1.3 Heat Exchangers and Steam Generators (No relief requests)

3.1.4 Piping Pressure Boundary

3.1.4.1 Request for Relief No. CR-02, Examination Category B-J, Items B9.11, B9.12, and B9.21, Containment Penetration Assembly Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Items B9.11 and B9.12 require surface and volumetric examinations to be performed on circumferential and longitudinal welds NPS 4 and larger; Item B 9.21 requires a 100% surface examination for circumferential welds less than NPS 4 as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric and surface examinations of the following inaccessible containment penetration welds:

INACCESSIBLE CONTAINMENT PENETRATION WELDS

SYSTEM	PEN.	UNIT 2 WELDS	UNIT 3 WELDS
Main Steam	X-105A	20-7N	20-22N
Main Steam	X-105B	20-7N	20-25N
Main Steam	X-105C	20-7N	20-22N
Main Steam	X-105D	20-7N	20-22N
Main Steam Drain	X-106	MSD2-22N	MSD2-33N
Feedwater	X-107A	18-6N	18-16N
Feedwater	X-107B	18-8N	18-20N
Iso Stm Supply	X-108A	14-5N	14-8N
Iso Cond Return	X-109B	12-7N, 12-7.1N	N/A
Shutdown Cooling	X-111A	16-1N, 16-1.1N	16-34N, 16-34.1N
Shutdown Cooling	X-111B	16-12N, 16-12.1N	16-18N, 16-18.1N
Rx Wtr Clean-Up	X-113	N/A	RWC-09FN
HPCI Stm Supply	X-115A	10-7N	N/A
HPCI Stm Supply	X-128	N/A	10-20N
LPCI Injection	X-116A	16-4N, 16-4.1N	N/A
LPCI Injection	X-116B	16-3N, 16-3.1N	N/A
SBLC	X-130	SLC1.5-28N, SLC1.5-29N	N/A
SBLC	X-138	N/A	SLC1.5-38N, SLC1.5-39N
Head Spray	X-147	HS2.5-29N, HS2.5-30N	HS2.5-25N, HS2.5-26N
Core Spray	X-149A	W-105N, W-105.1N	10-16.1N, 10-17N
Core Spray	X-149B	W-115N, W-115.1N	10-46.1N, 10-47N

<u>Licensee's Basis for Requesting Relief</u>: The licensee's basis is summarized as follows.

Each of the lines identified in the table penetrates the primary containment by means of a penetration assembly. These lines, due to the design of the penetration assembly, have at least one circumferential pressure retaining weld that is inaccessible for surface and volumetric examination.

Licensee's Proposed Examination: A VT-2 visual examination of the annular area of each of the subject penetration assemblies will be performed each outage in conjunction with the Class 1 system leakage test.

Evaluation: The Code requires surface and volumetric examinations to be performed on Examination Category B-J welds. The subject welds are located inside containment penetrations and are, therefore, inaccessible for examination. Imposition of this Code requirement would necessitate redesigning and replacing the existing penetrations, which would be a burden.

During the second inspection interval, the licensee performed surface and volumetric examinations of the adjacent out-of-containment welds as an alternative. This inspection interval (the third), the licensee is not proposing examination of the adjacent out-of-containment weld as an alternative. However, these welds do receive surface and volumetric examinations as terminal end welds under the Examination Category B-J requirements (this is also described in Relief Request CR-14).

Conclusion: Performance of the Code-required surface and volumetric examinations on the subject containment penetration welds is impractical due to the design of the penetration. The adjacent out-of-containment weld, as a terminal end, will receive a complete examination under Examination Category B-J. Additionally, the Code-required VT-2 visual examination of the penetration will be performed every outage. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.1.4.2 Request for Relief No. CR-03 (Part 1 of 2), Examination Category B-J, Items B9.31 and B9.32, Class 1 Branch Connection Welds With Reinforcement Saddles

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.31 requires a 100% surface and volumetric examination of the branch connection welds NPS 4 or larger; Item B9.32 requires a 100% surface examination of branch connection welds less than NPS 4 as defined by Figure IWB-2500-9, -10, or -11.

Licensee's Code Relief Request: The licensee requested relief from performing 100% of the Code-required volumetric and/or surface examination of various Class 1 branch connection welds designed with reinforcement saddles.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The design of certain Class 1 branch connection welds calls for the use of reinforcement saddles. These saddles are fillet welded over the actual pressure-retaining branch pipe-to-main pipe weld, completely encasing it. This design precludes any type of surface or volumetric examination from being performed on the pressure-retaining branch connection weld. However, additional assurance of the continued integrity of these joints is afforded by the fact that the reinforcement saddle strengthens the joint and reduces the stresses on the internal weld.

Licensee's Proposed Alternative Examination: The licensee proposes to perform a surface examination of both the saddle-to-main pipe weld and the saddle-to-branch pipe weld when the pressure-retaining weld is inaccessible due to the use of a reinforcement saddle.

Evaluation: The Code requires surface and volumetric examinations for branch connection welds NPS 4 and larger and surface examinations for branch connections less than NPS 4. The reinforcement saddle design precludes access to the pressure-retaining branch connection weld; therefore, the Code requirement is impractical. The licensee has proposed to perform alternative surface examinations of the reinforcement saddle fillet welds when the pressure-retaining branch connection welds are inaccessible. The proposed surface examination should detect any cracking that may propagate through the reinforcement saddle from the underlying branch connection weld. Imposition of the Code requirement on the licensee would cause a burden because the system would need to be redesigned and/or the branch connections replaced. The proposed surface examination, along with the VT-2 visual examination associated with the Class 1 system pressure tests, provides reasonable assurance of the continued structural integrity of the Class 1 branch connection welds.

Conclusion: The surface and volumetric examinations of the subject Class 1 pressure-retaining branch connection welds are impractical to perform at Dresden Station, Units 2 and 3. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.4.3 Request for Relief No. CR-08 (Part 1 of 2), Paragraph IWB-2430, Expansion Criteria for Welds Governed by Generic Letter 88-01 and NUREG-0313, Rev. 2

Code Requirement: Section XI, Paragraph IWB-2430 requires that:

(a) Additional examinations be performed during the current outage when indications exceed the acceptance standards of Table IWB-3410-1. The additional examinations shall include the remaining welds, areas, or parts included in the inspection item listing and scheduled for examination in this and the subsequent period.

(b) If the additional examinations required above reveal indications exceeding the acceptance standards of Table IWB-3410-1, the examinations at this outage shall be further extended to include all the welds, areas, or parts of similar design, size, and function.

(c) For the inspection period following the period in which the examinations of (a) or (b) above were completed, the examinations shall be performed as normally scheduled in accordance with IWB-2400.

Licensee's Code Relief Request: The licensee requested relief from the additional examination requirements of IWB-2430 for all full penetration circumferential and branch pipe connection welds in austenitic stainless steel piping that is NPS 4 or larger and contains reactor coolant at a temperature greater than 200°F during power operation.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

Each of the subject welds falls under the augmented inspection program required by Generic Letter (GL) 88-01 (Reference 12) and NUREG-0313, Rev. 2 (Reference 13). This program governs examination methods, examination frequency, and sample expansion. The sample expansion requirements of this program are designed such that additional examinations are limited to welds that have the same susceptibility to intergranular stress corrosion cracking (IGSCC) as the weld in which the flaw was found. This methodology ensures that welds at high risk for cracking are examined during the refueling outage, while not requiring expenditure of man-rem and outage time to examine additional low-risk welds.

In many instances, the examinations performed to meet the requirements of GL 88-01 are also applied to the percentages required by ASME Section XI. In these cases it is not practical to apply the expansion criteria of both GL 88-01/NUREG-0313 and ASME Section XI when unacceptable IGSCC flaw indications are identified.

Licensee's Proposed Alternative Examination: The licensee proposed to perform the sample expansions as required by GL 88-01 and NUREG-0313, Rev. 2, when unacceptable IGSCC flaw indications are identified in the subject welds.

Evaluation: The Code states that the examinations that reveal indications exceeding acceptance standards shall be extended to include the remaining welds, areas or parts included in the inspection item listing and scheduled for this and the subsequent period. NUREG-0313 states that an additional sample of the welds in the appropriate category (Categories A, B, and C) should be inspected, approximately equal in number to the original sample. The additional sample should be similar in distribution (pipe size, system, and location) to the original sample.

The licensee has requested to use the sample expansion criteria of NUREG-0313 for selecting additional examination areas. The NUREG-0313 sample expansion methodology is a systematic approach to aid in the determination of potential failure trends since the sample is selected from components with similar characteristics. In addition, the structure of the NUREG-0313 scheduling criteria essentially doubles the number of welds receiving volumetric examination during the 10-year interval for those welds susceptible to IGSCC. This original weld sample tends to offset any reduced additional examinations that may be required under the Code sample expansion criteria if IGSCC is identified.

Conclusion: The licensee's proposed alternative will provide an acceptable level of quality and safety because the additional examination areas selected will more closely relate to the welds where IGSCC is detected. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized.

3.1.4.4 <u>Request for Relief No. CR-12 (Part 1 of 2), Examination Categories B-F and B-J, Items B5.10, B5.130, B9.11 and B9.12, Weld Overlay Repaired Weld Joints</u>

<u>Code Requirement</u>: Section XI, Table IWB-2500-1, Examination Categories B-F and B-J, Items B5.10, B5.130, B9.11 and B9.12 all require 100% surface and volumetric examinations for pressure-retaining nozzle-to-safe-end welds and piping welds NPS 4 and larger as defined by Figure IWB-2500-8.

Figure IWB-2500-8 requires the surface examination to include the weld and 1/2 inch of base metal on each side of the weld, and the volumetric examination to include the lower 1/3 of the weld and base metal 1/4 inch on each side of the weld.

<u>Licensee's Code Relief Request</u>: The licensee requested relief from the Code-required examination volume for weld overlay repaired joints.

<u>Licensee's Basis for Requesting Relief</u>: The licensee's basis is summarized as follows.

Weld overlay repairs are examined in accordance with the requirements delineated in GL 88-01 using the ultrasonic (UT) examination technique developed by the NDE Center of the Electric Power Research Institute (EPRI). This technique is capable of detecting flaws in the weld overlay material and the outer 25% of the original pipe wall thickness. However, this technique cannot reliably detect flaws in the inner 75% of the original pipe wall thickness due to the acoustical properties of the weld overlay repairs.

Weld overlay repaired joints are sometimes inspected to satisfy the examination percentages required by ASME Section XI, Categories B-F, B-J, and C-F-1. In these cases, the examination volume required by Figures IWB-2500-8 or IWC-2500-7 of ASME Section XI cannot be satisfied.

Licensee's Proposed Alternative Examination: The licensee proposed to ultrasonically examine weld overlay repairs in accordance with the requirements set forth in GL 88-01. In addition, when scheduled examinations of weld overlay repairs are being applied to the percentages required by ASME Section XI, a surface examination will be performed on the entire weld overlay. Also, surface and volumetric examinations will be performed on at least one pipe diameter length but not more than 12 inches of any intersecting longitudinal welds, as measured from the edges of the weld overlay.

Evaluation: The Code requires that pressure-retaining nozzle-to-safe end welds and piping welds NPS 4 and larger receive surface and volumetric examinations. The volumetric examination must include the inner 1/3 volume of the weld and base metal 1/4 inch on each side of the weld.

Welds that have received weld overlay repair in accordance with the requirements delineated in GL 88-01 (Category E welds) are required to be inspected every other refueling outage. NUREG-0313 states, "... the inspection method should provide positive assurance that cracks have not progressed into the overlay. It is also desirable that the inspection procedure be capable of detecting cracks that originally were deeper than 75% of the original wall thickness, or that have grown to be deeper than 75% of the original wall thickness..." This examination schedule exceeds the Code requirement and will assure that the weld overlays will continue to provide the necessary safety margin.

The licensee should continue to monitor new or improved examination techniques. As improvements in these areas are achieved, the licensee should adopt these techniques in the ISI examination procedures.

Conclusion: The proposed alternative examinations will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized.

3.1.4.5 Request for Relief No. CR-14, Examination Category B-J, Items B9.11, B9.12, B9.21, B9.22, B9.31, B9.32, and B9.40, Weld Selection Criteria

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J requires that the extent and frequency of examinations be determined using Notes 1 and 2.

Note 1(b) states that examinations shall include all terminal ends and joints in each pipe or branch run connected to other components where the stress levels exceed either of the following limits under loads associated with specific seismic events and operational conditions:

(1) primary plus secondary stress intensity range of $2.4S_m$ for ferritic steel and austenitic steel

(2) cumulative usage factor U of 0.4

Note 2 states that the initially selected welds shall be reexamined during each inspection interval.

Licensee's Code Relief Request: The licensee requested relief from the Table IWB-2500-1, Note 1 and 2 requirements regarding the selection of Category B-J welds for examination.

Licensee's Basis for Requesting Relief: The licensee stated:

"The construction permits for Dresden Units 2 and 3 were issued on January 10, 1966 and October 14, 1966, respectively. At that time, piping, pumps, and valves were built primarily to the rules of USAS B31.1.0-1967, *Power Piping*, and not to Section III of the ASME Boiler and Pressure Vessel Code. Because the stress intensity range and usage factor described in Note 1(b) are parameters associated with ASME Section III piping design characteristics, this information does not currently exist for the ISI Class 1 piping at Dresden Station and would be cost prohibitive to obtain. Although the stress data required by USAS B31.1.0-1967 does exist for the ISI Class 1 piping at Dresden Station, it differs from that required by ASME Section III and does not correlate to specific weld locations.

As allowed by 10 CFR 50.55a(b)(2)(ii), the criteria used for the selection of Category B-J welds during the first and second intervals at Dresden Station was based on ASME Section XI, 1974 Edition through Summer 1975 Addenda (74S75). This weld selection methodology basically requires the examination of a different 25% of the piping welds each inspection interval, such that 100% of the welds will have been examined at the end of the 40 year licensing period. To continue selecting welds in this manner will result in considerable man-rem expenditures to prepare new welds for examination each interval. Additionally, this method does not ensure that potentially high stressed welds are reexamined over the course of plant life to monitor for service induced degradation.

Use of the proposed alternate weld selection methodology described below will help to maintain the radiation exposure expended for weld preparation "As Low As Reasonably Achievable". In addition, this selection methodology has been designed to choose those welds which have a greater probability of being subject to higher stress levels. Putting emphasis on the inspection of potentially higher stressed welds will improve the overall quality and safety levels of the ISI Program."

Licensee's Proposed Alternative Examination: Dresden Station will select Category B-J welds for examination such that 25% of the total non-exempt welds are examined during the interval. These welds will then be reexamined during subsequent intervals per Table IWB-2500-1, Note 2. The weld population selected for inspection shall include the following:

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

2. All terminal ends in each pipe or branch run connected to other components.

3. Additional piping welds such that the total number of circumferential butt welds (or branch connection or socket welds) selected for examination equals 25% of the total number of non-exempt circumferential butt welds (or branch connection or socket welds) in the reactor coolant piping system. These additional piping welds shall be distributed as follows:

    a. The examinations shall be distributed among the Class 1 systems prorated, to the degree practicable, on the number of non-exempt welds in each system (i.e., if a system contains 30% of the non-exempt welds, then 30% of the nondestructive examinations required by Category B-J should be performed on that system);

    b. Within a system, the examinations shall be distributed among structural discontinuities prorated, to the extent practicable, on the number of non-exempt structural discontinuities in that system; and

    c. Within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

<u>Evaluation</u>: Note 1(b) of the Code requires an evaluation of primary plus secondary stress intensities and cumulative usage factors. Dresden Station was built to the requirements of USAS B31.1.0-1967, *Power Piping*, and not to ASME Section III, where these parameters apply. 10 CFR 50.55a(b)(2)(ii) allows the use of the 74S75 Code for plants with docketed construction permit applications prior to July 1, 1978. Use of the 74S75 Code for Class 1 piping is limited to Tables IWB-2500 and IWB-2600, Examination Category B-J, for determining the extent of examination. The weld selection methodology for examination of a different 25% of the piping welds each interval appears in

Paragraph IWB-2420, *Successive Inspections*, and is not included in the later code editions.

The 74S75 Code requires examination of 25% of the circumferential weld joints and 25% of the pipe branch connections. The licensee's proposed alternative will include all terminal ends or branch runs connected to vessels and other components. Additional welds will be selected based upon the criteria established in the 1989 Edition. This alternative selects for examination a larger portion of the welds subjected to higher stress levels.

Conclusion: Because the licensee's proposed alternative provides a sound engineering approach to Class 1 weld selection by concentrating the examinations on those welds with higher stress levels, it is considered equivalent. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized.

3.1.4.6 Request for Relief No. CR-15, Examination Category B-J, Items B9.11 and B9.12, Cast Stainless Steel Elbow-to-Pump Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Items B9.11 and B9.12 require 100% volumetric and surface examinations of the circumferential and longitudinal piping welds NPS 4 or larger as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric and surface examinations of welds 202-1A-D6 and 202-1B-D4 for Unit 2, and welds 28-11 and 28-K12 for Unit 3.

Licensee's Basis for Requesting Relief: The licensee stated:

"There are two reactor recirculation pumps in each unit. On the suction side of each reactor recirculation pump there is one

NPS 28 weld between the cast stainless steel elbow and the cast stainless steel pump body. The pump casings and attached elbows are castings fabricated from Grade CF8M stainless steel.

The performance of the Code-required volumetric and surface examinations of the four subject reactor recirculation piping welds is impractical due to the ALARA considerations, design limitations, and material property constraints described below:

- ALARA: The outside surface of the weld and adjacent base material is obstructed by a large whip restraint made of cables and trays. Removal and re-installation of each whip restraint would require in excess of 10 person-rem. Therefore, from an ALARA standpoint, it is highly prohibitive to gain access to the subject welds in order to perform volumetric or surface examinations.

- DESIGN LIMITATIONS: Even if the welds were made accessible for examination purposes, the current weld configuration (outside surface contour) of each weld precludes the performance of a meaningful ultrasonic examination. As shown in attached Figure CR-15.1*, the 1.80" wide weld crown is located in the middle of a trough approximately 4.5" wide and 0.5" deep. This configuration is too restrictive to allow the proper placement and movement of the transducer search unit(s) needed to obtain sufficient coverage in the axial direction (i.e., to search for circumferential flaws).

  In addition to the constraints on ultrasonic examinations, there are design limitations which prohibit the performance of a meaningful radiographic examination on the subject welds. Over the years of operation, the adjacent reactor recirculation pump has become a significant source of radiation. During radiography, the nearby pump will act as an uncontrolled source of radiation which will cause rejection of the radiographs. Therefore, it is not possible to produce Code acceptable radiographs on the subject welds.

- MATERIAL PROPERTIES: Due to the highly attenuative nature of the cast stainless steel pumps and elbows, the ability of an ultrasonic examination to interrogate the complete weld volume in accordance with ASME Section XI criteria cannot be ensured.

Even without the performance of ASME Code examinations, a sufficient margin of safety exists due to the following considerations:

- The most notable degradation mechanism in BWR stainless steel piping is Intergranular Stress Corrosion Cracking

*Figure CR-15.1 is not included in this document.

(IGSCC). Due to the carbon and delta ferrite content in Grade CF8M castings, the cast pumps and elbows are considered to be resistant to IGSCC.

- In Report SIR-92-002 dated March 12, 1992, Structural Integrity Associates, Inc. determined that the leakage associated with half of the critical flaw size was approximately 50 gpm. This leakage far exceeds the allowable unidentified leakage limit of 5 gpm specified in the Dresden Technical Specifications. Therefore, leakage would be detected long before the flaw reached its critical size."

Licensee's Proposed Examination: The licensee will perform the Code-required VT-2 visual examination in conjunction with the Class 1 pressure test conducted at the end of each refueling outage.

Evaluation: The Code requires that Class 1 circumferential and longitudinal pipe welds receive volumetric and surface examinations. Whip restraints obstruct access to the welds. If the whip restraints could be removed, volumetric examination would be limited due to the weld configuration (i.e., 4.5 in. wide, 0.5 in. deep trough). The current weld configuration, therefore, makes volumetric examination of these welds impractical to perform.

Removal and re-installation of each whip restraint is reported to require in excess of 10 person-rem radiation exposure. The surface examination would require additional personnel radiation exposure. Due to the nature of IGSCC degradation (i.e., originating at the ID surface), an OD surface examination would more than likely not detect cracking prior to leakage. The benefit from performing the surface examination does not out weigh the ALARA considerations.

Conclusion: The Code-required volumetric examination is impractical to perform at Dresden Station. The licensee's proposed alternative examination will provide a reasonable assurance of operational readiness because leakage would be detected before a crack reached critical flaw size. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.5 Pump Pressure Boundary (No relief requests)

3.1.6 Valve Pressure Boundary (No relief requests)

3.1.7 General (No relief requests)

3.2 Class 2 Components

3.2.1 Pressure Vessels

3.2.1.1 Request for Relief No. CR-05, Examination Category C-A, Item C1.30, Low Pressure Coolant Injection (LPCI) Heat Exchanger Tubesheet-to-Shell Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-A, Item C1.30 requires a 100% volumetric examination of the tubesheet-to-shell welds as defined by Figure IWC-2500-2. In the case of multiple vessels of similar design, size, and service (i.e., steam generators, heat exchangers), the required examinations may be limited to one vessel or distributed among the vessels.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination of the following upper and lower tubesheet-to-shell welds on the LPCI heat exchangers:

UNIT 2

2-1503A-1 2-1503A-2 2-1503B-1 2-1503B-2

UNIT 3

3-1503A-1   3-1503A-2   3-1503B-1   3-1503B-2

Licensee's Basis for Requesting Relief: The licensee stated:

"The LPCI heat exchanger tubesheet-to-shell welds as shown on Figure CR-05.1* are designed with a geometry that provides a corner trap for ultrasonic signals. The geometric reflectors inherent in this design prevent a meaningful ultrasonic examination from being performed on these welds.

An investigation into the feasibility of performing ultrasonic examinations on the subject welds was conducted during the second ten-year interval Inservice Inspection Program for Dresden Units 2 and 3. The investigation consisted of building a mock-up of the tubesheet-to-shell weld configuration and attempting to differentiate notches from the geometric corner trap inherent in the design, utilizing various ultrasonic examination techniques. The investigation concluded that a meaningful ultrasonic examination can not be performed on this joint configuration."

Licensee's Proposed Alternative Examination: The licensee proposed to perform a magnetic particle examination of the subject welds each inspection interval. Additionally, a VT-2 visual examination at nominal operating pressure will be performed on the shell side of the heat exchanger each inspection period. Also, the monthly LPCI pump operability test requires the operator to perform a visual inspection for leakage when the heat exchanger is at operating pressure.

Evaluation: The Code requires a 100% volumetric examination of the subject tubesheet-to-shell welds. The mock-up investigation demonstrated that a satisfactory volumetric examination cannot be performed on this weld design. The licensee proposed to perform a magnetic particle examination of the subject welds each interval, a VT-2 visual examination each period, and a visual inspection for leakage during the monthly LPCI pump operability test. With the increased frequency of the inspections being performed, the licensee's proposal will provide reasonable

*Figure CR-05.1 is not included in this document.

assurance of the continued structural integrity of the LPCI heat exchanger.

Conclusion: The volumetric examination of the subject tubesheet-to-shell welds is impractical to perform at Dresden Station, Units 2 and 3. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.2.2 Piping

3.2.2.1 Request for Relief No. CR-03 (Part 2 of 2), Examination Categories C-F-1 and C-F-2, Items C5.41, C5.42, C5.81, and C5.82, Class 2 Branch Connection Welds With Reinforcement Saddles

Code Requirement: Section XI, Table IWC-2500-1, Examination Categories C-F-1 and C-F-2, Items C5.41, C5.42, C5.81, and C5.82 require a 100% surface examination of branch connection welds greater than NPS 4, as defined by Figures IWC-2500-9 through -13.

Licensee's Code Relief Request: The licensee requested relief from performing 100% of the Code-required surface examination of various Class 2 branch connection welds that are designed with a reinforcement saddle.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The design of certain Class 2 branch connection welds calls for the use of reinforcement saddles. These saddles are fillet welded over the actual pressure-retaining branch pipe-to-main pipe weld, completely encasing it. This design precludes any type of surface examination from being performed on the pressure-retaining branch connection weld. However, additional assurance of the continued integrity of these joints is afforded because the reinforcement saddle strengthens the joint and reduces the stresses on the internal weld.

Licensee's Proposed Alternative Examination: The licensee proposed to perform a surface examination of both the saddle-to-main pipe weld and the saddle-to-branch pipe weld when the pressure-retaining weld is inaccessible due to a reinforcement saddle.

Evaluation: The Code requires that a surface examination be performed on branch connection welds greater than NPS 4. Due to the reinforcement saddle design, there is no access to the pressure-retaining branch connection weld, therefore, the Code-required examination is impractical to perform. The licensee proposed a surface examination of the reinforcement saddle fillet welds when the pressure-retaining branch connection welds are inaccessible. The proposed surface examination would detect any cracking that may propagate through the reinforcement saddle from the underlying branch connection weld. Imposition of the Code requirement on the licensee would cause a burden because the system would have to be redesigned and the branch connections would have to be replaced. The proposed surface examination of the reinforcement saddle fillet welds, along with the VT-2 visual examination performed in conjunction with the Class 2 System Pressure Tests, provides reasonable assurance of the continued structural integrity of the Class 2 branch connection welds.

Conclusion: The surface examination of the subject Class 2 branch connection welds is impractical to perform at Dresden Station, Units 2 and 3. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.2.2 Request for Relief No. CR-08 (Part 2 of 2), Paragraph IWC-2430, Expansion Criteria for Welds Governed by Generic Letter 88-01 and NUREG-0313, Rev. 2

Code Requirement: Section XI, Paragraph IWC-2430 requires that:

(a) Additional examinations be performed when indications exceed the acceptance standards of IWC-3000. The examinations shall include an additional number of components (or areas) within the same examination category, approximately equal to the number of components (or areas) examined initially.

(b) If these additional examinations detect further indications exceeding the acceptance standards of IWC-3000, the remaining similar components (or areas) within the same examination category shall be examined to the extent specified in Table IWC-2500-1.

Licensee's Code Relief Request: The licensee requested relief from the additional examination requirements of IWC-2430 for all Class 2, full penetration, circumferential and branch pipe connection welds in austenitic stainless steel piping that is NPS 4 or larger and contains reactor coolant at a temperature greater than 200°F during power operation.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

Each of the subject welds is included in the augmented inspection program required by Generic Letter (GL) 88-01 (Reference 12) and NUREG-0313, Rev. 2 (Reference 13). This program governs examination methods, examination frequency, and sample expansion. The sample expansion requirements of this program are designed such that additional examinations are limited to welds that have the same susceptibility to intergranular stress corrosion cracking (IGSCC) as the weld in which the flaw was found. This methodology ensures that welds at a high risk for cracking are examined during the refueling outage, while not requiring expenditure of the man-rem and outage time associated with examining additional low-risk welds.

In many instances, the examinations performed to meet the requirements of GL 88-01 are also used to meet the requirements of ASME Section XI. In these cases it is not practical to apply the expansion criteria of both GL 88-01/NUREG-0313 and ASME Section XI when unacceptable IGSCC flaw indications are identified.

Licensee's Proposed Alternative Examination: The licensee proposed to perform the sample expansions as required by GL 88-01 and NUREG-0313, Rev. 2, when unacceptable IGSCC flaw indications are identified in the subject welds.

Evaluation: When unacceptable IGSCC flaw indications are identified, the Code requires that an additional number of components (or areas) within the same examination category, approximately equal to the number of components (or areas) examined initially, be examined. NUREG-0313 states that an additional sample of the welds in the appropriate category (Categories A, B, and C) should be inspected, approximately equal in number to the original sample. The additional sample should be similar in distribution (pipe size, system, and location) to the original sample.

The licensee has requested to use the sample expansion criteria of NUREG-0313 for selecting additional examination areas. The NUREG-0313 sample expansion methodology is a systematic approach to aid in determining potential failure trends since the sample is selected from components with similar characteristics. In addition, the structure of the NUREG-0313 scheduling criteria essentially doubles the number of welds receiving volumetric examination during the 10-year interval for those welds susceptible to IGSCC. This method tends to offset any reduction in the number of additional examinations that may be required under the sample expansion criteria if IGSCC is identified.

Conclusion: The licensee's proposed alternative will provide an acceptable level of quality and safety because the additional examination areas selected will more closely relate to the welds where IGSCC is detected. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized.

3.2.2.3 Request for Relief No. CR-12 (Part 2 of 2), Examination Category C-F-1, Items C5.11 and C5.12, Weld Overlay Repaired Weld Joints

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-F-1, Items C5.11 and C5.12 require 100% surface and volumetric examinations for pressure-retaining nozzle-to-safe end welds and piping welds greater than NPS 4 as defined by Figure IWC-2500-7.

Figure IWC-2500-7 requires the surface examination to include the weld and 1/2 inch of base metal on each side of the weld, and the volumetric examination to include the lower 1/3 of the weld and base metal 1/4 inch on each side of the weld.

Licensee's Code Relief Request: The licensee requested relief from examining the entire Code-required volume of weld overlay repaired joints.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

Weld overlay repairs are examined in accordance with the requirements delineated in GL 88-01 using the ultrasonic (UT) examination technique developed by the EPRI NDE Center. This technique is capable of detecting flaws in the weld overlay material and the outer 25% of the original pipe wall thickness. However, this technique cannot reliably detect flaws in the inner 75% of the original pipe wall thickness due to the unique acoustical properties of the weld overlay repairs.

Weld overlay repaired joints are sometimes inspected to satisfy the examination percentages required by ASME Section XI, Categories B-F, B-J, and C-F-1. In these cases, the examination volume required by Figures IWB-2500-8 or IWC-2500-7 of ASME Section XI cannot be satisfied.

Licensee's Proposed Alternative Examination: The licensee proposed to perform the ultrasonic examinations of weld overlay repairs in accordance with the requirements set forth in GL 88-01. Additionally, when scheduled examinations of weld overlay repairs are being applied to the percentages required by ASME Section XI, a surface examination will be performed on the entire weld overlay surface. Also, surface and volumetric examinations will be performed on at least one pipe diameter length but not more than 12 inches of any intersecting longitudinal welds, as measured from the edges of the weld overlay.

Evaluation: The Code requires that pressure-retaining nozzle-to-safe-end welds and piping welds NPS 4 and larger receive surface and volumetric examinations. The volumetric examination shall include the inner 1/3 volume of the weld and base metal 1/4 inch on each side of the weld.

Welds that have received weld overlay repair in accordance with the requirements delineated in GL 88-01 (Category E welds) are required to be inspected every other refueling outage. NUREG-

0313 states, "... the inspection method should provide positive assurance that cracks have not progressed into the overlay. It is also desirable that the inspection procedure be capable of detecting cracks that originally were deeper than 75% of the original wall thickness, or that have grown to be deeper than 75% of the original wall thickness..." This examination is in excess of the Code requirement and will assure that the weld overlays will continue to provide the necessary safety margin.

The licensee should continue to monitor new or improved examination techniques. As improvements are achieved, the licensee should adopt these techniques into the ISI examination procedures.

Conclusion: The proposed alternative examinations will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized.

3.2.3 Pumps (No relief requests)

3.2.4 Valves (No relief requests)

3.2.5 General (No relief requests)

3.3 Class 3 Components (No relief requests)

3.4 Pressure Tests

3.4.1 Class 1 System Pressure Tests

3.4.1.1 Request for Relief No. PR-15, Examination Category B-P, Definition of Pressure Retaining Boundary for System Leakage Test

NOTE: In the December 4, 1992 response to the NRC's request for additional information, the licensee withdrew Relief Request No. PR-15 as a result of the RAI.

3.4.2 Class 2 System Pressure Tests

3.4.2.1 Request for Relief No. PR-03, Examination Category C-H, Pressure Testing of the RPV Head Flange Seal Leak Detection System

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure tests and system hydrostatic tests of Class 2 components. Paragraph IWC-5210(a)(2) requires a system pressure test to be conducted during a system inservice test for pressure-retaining components within each system boundary that are required to function during normal plant operation.

Paragraph IWC-5210(a)(2) requires the pressure-retaining components within each system boundary to be subjected to a system hydrostatic pressure test.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required system pressure testing of the RPV Head Flange Seal Leak Detection System.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The RPV Head Flange Leak Detection Line is separated from the reactor pressure boundary by one passive membrane, a silver plated O-ring located on the vessel flange. A second O-ring is located on the opposite side of the tap in the vessel flange. This line indicates failure of the inner flange seal O-ring and is required during plant operation. Failure of the O-ring would result a high-level radioactive steam alarm in the control room. Failure of the inner O-ring is the only condition under which this line is pressurized.

The configuration of this system precludes hydrostatic testing while the vessel head is removed--the configuration of the vessel tap and the high test pressure required (1000 psig minimum) prevent the tap in the flange from being temporarily plugged. The opening in the flange is only 3/16 of an inch in diameter and is smooth walled, making a high-pressure temporary seal very difficult to achieve. Failure of this seal could eject the device used for plugging into the vessel.

The configuration also precludes hydrostatic testing with the vessel head installed because the seal prevents complete filling of the line, which has no vent. Additionally, a pneumatic test performed with the head installed is precluded by the configuration of the top head of the vessel. The top head contains two grooves for the O-rings. The O-rings are held in place by a series of retainer clips spaced 15° apart. The retainer clips are contained in a cavity in the top head. If a pressure test was performed with the head on, the inner O-ring would be pressurized in the direction opposite to normal operation, which would tend to push it into the recessed cavity that houses the retainer clips. The O-ring material is only 0.050 in. thick with silver plating 0.004 to 0.006 in. thick and could be damaged by this deformation into the recessed areas on the top head.

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

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

Licensee's Proposed Alternative Examination: The licensee proposed to perform a VT-2 visual examination on the line during vessel flood-up in a refueling outage. The hydrostatic head developed by the water above the vessel flange during flood-up will allow detection of any gross indications in the line. This examination will be performed with the frequency specified by Table IWC-2500-1 for an IWC-5221 system pressure test (once each inspection period).

Evaluation: The Code requires that system pressure tests be conducted for those systems required to operate during normal plant operation. The RPV Head Flange Leak Detection Line is pressurized only when the inner O-ring fails. To submit these O-rings to a pressure test would require pressurization in a direction opposite than that intended by the design. Such a pressure test would likely damage the O-rings. The design of this line, therefore, makes the Code-required system pressure tests impractical to perform. To perform the system pressure tests in accordance with the requirements, the RPV Head Flange Leak Detection System and the RPV flange would have to be redesigned, fabricated and installed.

The licensee has committed to perform a VT-2 visual examination on the RPV Head Flange Leak Detection Line during vessel flood-up. The proposed alternative will provide adequate assurance that unallowable inservice flaws have not developed in this line or that they will be detected and repaired prior to return to service.

Conclusion: The system pressure test required by Section XI for the subject Class 2 line is impractical to perform at Dresden Station because of the possibility of damage to the O-ring seals. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.2 Request for Relief No. PR-04, Paragraph IWC-5222(b), Hydrostatic Test of the Standby Liquid Control (SBLC) Tank

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure and hydrostatic tests of Class 2 components. IWC-5222(b) states that in the case of atmospheric storage tanks, the nominal hydrostatic pressure developed with the tank filled to its design capacity shall be acceptable as the system test pressure.

Licensee's Code Relief Request: The licensee requested relief from Code requirements for testing the Standby Liquid Control Tank at the design capacity level.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The tank level associated with the design capacity of the SBLC tank is above the overflow level of the tank. The design capacity is 12 ft-0 in. (Max. tank height), the overflow level is 11 ft-3 in. (5295 gal.) and the minimum level is 7 ft-7 3/4 in.

(3605 gal.). It is impossible to fill the tank to its design level due to a nonisolable overflow line. While the system could be taken out of service to perform the hydrostatic pressure test with the SBLC tank filled to its overflow level, it is impractical to fill the SBLC tank to a level above its normal operating level (greater than 3605 gallons) due to problems associated with disposing of the excess sodium pentaborate, and the tight limits on sodium pentaborate concentration.

The difference in test pressure (5.2 psig at overflow level vs. 3.5 psig at Technical Specification minimum level) is so slight that a test with the SBLC tank filled to the level permitted in the Technical Specification is essentially the same as a test with the SBLC tank filled to its overflow capacity.

Licensee's Proposed Alternative Examination: The licensee proposed that the SBLC tank, and associated unisolable piping in Test Block 11A1, will be visually examined (VT-2) with the SBLC tank level greater than or equal to the minimum level permitted by the Technical Specifications.

Evaluation: The Code requires that atmospheric storage tanks be filled to design capacity for the system hydrostatic test. The overflow level (11 ft-3 in.) for the SBLC tank is below design capacity (12 ft). The design of the SBLC tank, therefore, makes the Code-required hydrostatic pressure test impractical to perform. The licensee proposed to perform a VT-2 visual examination with the SBLC tank at or above the minimum level allowed by the Technical Specifications. This will provide a reasonable assurance of the continued structural integrity of the subject system because the difference in pressure, cited by the licensee, is only 1.7 psig (5.2 psig at overflow, 3.5 psig at minimum). The problems associated with pressure testing above the normal operating level and disposing of the excess sodium pentaborate represent a hardship.

Conclusion: The Code requirement to fill the SBLC tank to design capacity for hydrostatic testing is impractical for Dresden Station. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.3 Request for Relief No. PR-06, Paragraph IWA-5241(b), Alternate VT-2 Visual Examination for Isolation Condenser Tubes

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure and hydrostatic tests of Class 2 components. Paragraph IWA-5241(b) states that the VT-2 visual examination of inaccessible components shall consist of an examination of the surrounding area, including floor areas or equipment surfaces located underneath the components, for evidence of leakage.

Licensee's Code Relief Request: The licensee requested relief from performing a VT-2 visual examination of the Class 2 Isolation Condenser tubing during static and operational pressure testing.

Licensee's Basis for Requesting Relief: The licensee stated that:

"The ISI Class 2 Isolation Condenser tubing is located at the bottom of the Isolation Condenser, below a grating. This tubing is submerged by the shell side water whenever the Isolation Condenser is operable. A visual examiner cannot enter the Isolation Condenser during an operational or static pressure test, and even if an examiner could enter the Isolation Condenser, no meaningful visual examination could be performed because the tubes are submerged under water from the shell side."

Licensee's Proposed Alternative Examination: The licensee stated that the Isolation Condenser tubing is tested by monitoring the level in the shell side of the Isolation Condenser during performance of the RPV system pressure test, at which time the Isolation Condenser tube side is filled with water and pressurized to a minimum of 1000 psig. Any rise in the shell side level experienced during the tube side pressurization is attributed to tube leakage.

In addition, a heat removal capability test is performed once every five years on the Isolation Condenser. Any Isolation Condenser tube leakage would be detected by the radiation sensing elements in the shell side vent piping. Finally, an inspection of the Isolation Condenser internals is performed each refueling outage with the Isolation Condenser drained.

Evaluation: The Code requires that the surrounding area be examined for evidence of leakage for those components whose external surfaces are inaccessible for direct visual examination. In the case of the Isolation Condenser tubes, the surrounding area is full of water. The system design, therefore, makes this Code requirement impractical to perform at Dresden Station. Imposition of the Code requirement would cause a burden because it would require redesign and replacement of the subject system. The licensee's proposed alternative is to monitor the Isolation Condenser fluid level during pressure testing of the tubes. In addition, the radiation sensing elements in the shell side vent piping will detect excess radiation levels in the Isolation Condenser should leakage occur. This proposal will provide a reasonable assurance of the continued inservice structural integrity as leakage would be detected in sufficient time to perform corrective action.

Conclusion: Performance of the Code-required VT-2 visual examination during pressure testing is impractical. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.4 Request for Relief No. PR-09, Paragraph IWA-5241(b), Alternate Pressure Testing for Class 2 Low Pressure Coolant Injection Heat Exchanger Tubes

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure and hydrostatic tests of Class 2 components. Paragraph IWA-5241(b) states that the VT-2 visual examination of inaccessible components shall consist of an examination of the surrounding area, including floor areas or equipment surfaces located underneath the components, for evidence of leakage.

Licensee's Code Relief Request: The licensee requested relief from performing the VT-2 visual examination of the Class 2 Low Pressure Coolant Injection (LPCI) Heat Exchanger tubing during hydrostatic and operational pressure tests.

Licensee's Basis for Requesting Relief: The licensee stated:

"The tubing inside the LPCI Heat Exchanger is inaccessible. A visual examiner cannot enter the LPCI Heat Exchanger to perform an examination of the tubes during operational or hydrostatic pressure testing."

Licensee's Proposed Alternative Examination: The licensee stated that the tubing in the LPCI Heat Exchanger will be 100% eddy current tested (ET). Eddy current testing is superior to visual examination performed during a system pressure test because it can identify flaws that are not "through-wall". ET will be performed on the tubes in the LPCI Heat Exchangers once each refueling outage.

Evaluation: The Code requires that the surrounding area be examined for evidence of leakage for those components whose external surfaces are inaccessible for direct visual examination. The licensee's proposed alternative is to perform 100% eddy current testing on the tubes in the LPCI Heat Exchangers once each refueling outage. Eddy current testing is a volumetric examination method (for thin-walled tubes) that exceeds the Code requirement for VT-2 visual examination. If performed properly, ET will provide a mechanism for detecting and monitoring inservice degradation. This proposal will provide an acceptable level of quality for the heat exchanger tubes.

Conclusion: The ET examination will provide an acceptable level of quality and safety, therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized as requested.

3.4.2.5 Request for Relief No. PR-11, Paragraph IWA-5241(b), Alternate Testing for Core Spray (CS) and Low Pressure Coolant Injection (LPCI) Pump Motor Coolers

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure and hydrostatics test of Class 2 components. Paragraph IWA-5241(b) states that the VT-2 visual examination of inaccessible components shall consist of an examination of the surrounding area, including floor areas or equipment surfaces located underneath the components, for evidence of leakage.

Licensee's Code Relief Request: The licensee requested relief from performing the VT-2 visual examination of the LPCI and CS pump motor lube oil coolers during hydrostatic and operational pressure tests.

Licensee's Basis for Requesting Relief: The licensee stated:

"The coils of the LPCI and CS pump motor lube oil coolers are inside the motor housings and cannot be examined during a hydrostatic or operational pressure test."

Licensee's Proposed Alternative Examination: In lieu of a VT-2 visual examination of the cooler coils, the licensee has proposed to perform a pneumatic test by capping one end of the cooler supply and pressurizing the coil to 85 psig. The flow of air required to maintain this pressure will be measured after a 10-min hold time. Any measured flow will be attributed to tube leakage. The cooling coils in the LPCI and CS pumps will only be considered acceptable if no leakage is detected.

Evaluation: The Code requires that the surrounding area be examined for evidence of leakage for those components whose external surfaces are inaccessible for direct visual examination. The coils of the LPCI and CS pump motor lube oil coolers are inside the motor housings and cannot be examined during pressure tests. The Code-required VT-2 visual examination is, therefore, impractical to perform. The licensee proposed a pneumatic flow test be performed in lieu of the system pressure tests. The flow meter typically used in this type of application at Dresden (as stated in the August 13, 1993 response to the NRC request for additional information) will provide a measurement of flow as low as 0.08 scfh with an accuracy of ±0.02 scfh. This represents the first marked graduation on the flowmeter. Flows lower than 0.08 scfh can be detected by the lifting of the flowmeter ball off its lower seat, but can not be quantified. Any leakage detected would be documented as unacceptable. This proposal will provide a reasonable assurance of the continued operational readiness and integrity of the cooling coils in the LPCI and CS pumps.

Conclusion: The VT-2 visual examination of the LPCI and CS cooling coils is impractical to perform. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.6 Request for Relief No. PR-12, Paragraph IWC-5222(a), Alternate Testing for High Pressure Coolant Injection (HPCI) Turbine and Connected Steam Inlet and Discharge Piping

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure and hydrostatic tests of Class 2 components. Paragraph IWC-5222(a) states that the system hydrostatic test pressure shall be at least 1.25 times the system pressure, P_{sv}, for systems with a design temperature above 200°F. It also states that the system pressure, P_{sv}, shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested (or Design Pressure, P_d, if overpressure protection is not provided).

Licensee's Code Relief Request: The licensee requested relief from performing a hydrostatic pressure test of the HPCI Turbine and associated steam supply and discharge piping in Test Block 23B1.

Licensee's Basis for Requesting Relief: The licensee states:

"The HPCI Turbine and HPCI Stop Valve shafts utilize a labyrinth design to provide a steam seal at the shafts (see Figure PR-12.1*). The labyrinth seals reduce the pressure in the steam and, eventually, steam and condensate are collected by low pressure collection piping that is routed to the gland seal condenser. This low pressure piping can not be isolated from the turbine shaft and/or the stop valve shaft seals. During a static test this piping would experience the same pressure as the HPCI Turbine. Because this seal leak collection piping is of a much lower design pressure, a hydrostatic test at the HPCI Turbine design pressure could result in damage to the leak collection piping."

*Figure PR-12.1 is not included in this document.

Licensee's Proposed Alternative Examination: The licensee proposed to perform a system functional test in lieu of the system hydrostatic test required once each interval.

Evaluation: The Code-required system hydrostatic test pressure is 1.25 times the system pressure for systems with a design temperature above 200°F. The licensee proposes a system functional test in lieu of the hydrostatic pressure test for the subject system. Performance of the hydrostatic test to the Code-required test pressure could damage the labyrinth seals on the HPCI Turbine and HPCI Stop Valve shafts and is, therefore, impractical.

The licensee is using Code Case N-498, "Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems," to perform a pressure test at nominal operating pressure with the appropriate hold times in lieu of the system hydrostatic test. However, as stated in Technical Approach and Position Number PT-01 of the Dresden Third Interval ISI Program Plan,

"When a system (or portion of a system) is not pressurized during a system functional test, or when a system can not be run long enough to meet the appropriate hold time, then a separate hydrostatic test will be performed on that system."

The licensee is indirectly requesting relief from the hold time requirement of Code Case N-498.

Conclusion: The Code-required hydrostatic test is impractical to perform and the system functional test will provide a reasonable assurance of the continued inservice structural integrity of the subject piping because the test will be performed at operating pressure. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.4.2.7 Request for Relief No. PR-17, Paragraph IWA-5241(b), Alternate Testing for HPCI Lube Oil Cooler and HPCI Gland Seal Condenser Tubing

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during system pressure and hydrostatic tests of Class 2 components. Paragraph IWA-5241(b) states that the VT-2 visual examination of inaccessible components shall consist of an examination of the surrounding area, including floor areas or equipment surfaces located underneath the components, for evidence of leakage.

Licensee's Code Relief Request: The licensee requested relief from performing the VT-2 visual examination of the HPCI Lube Oil Cooler and the HPCI Gland Seal Condenser tubing during hydrostatic and operational pressure tests.

Licensee's Basis for Requesting Relief: The licensee stated:

"The tubes of the HPCI Lube Oil Cooler provide a pressure boundary between the ISI Class 2 cooling water supply and the non-classed lube oil supply which circulates through the shell side of the heat exchanger. The tubing in the gland seal condenser provides a boundary between the gland seal cooling water and the turbine gland seal steam. The tubes in both of these heat exchangers cannot be visually examined during system operation or during a hydrostatic pressure test."

Licensee's Proposed Alternative Examination: In lieu of a VT-2 visual examination of the HPCI Lube Oil Cooler tubing, the licensee proposed the use of oil analysis on the HPCI lube oil to detect evidence of water leakage from the tubes. To emulate the worst case conditions, the cooling water system will be run for 10 min, with no pressure on the lube oil system, just prior to drawing the sample for the oil analysis. This will provide a higher differential pressure across the tubes than would be experienced during normal operation (normally the system runs with the lube oil at a higher pressure than the cooling water). The tubes in the lube oil cooler will only be considered acceptable if no water is detected in the oil sample. Oil analysis is capable of detecting a water content as low as .01%. This percentage of water in the filled oil reservoir would represent a leakage of approximately 0.4 mL/min over a 10 min cooling pump run.

In lieu of a VT-2 visual examination of the Gland Seal Condenser tubing, the licensee proposed to monitor the level in the Gland Seal Condenser hotwell with the auxiliary cooling water pump running and no steam being supplied to the turbine for evidence of water leakage from the tubes. Any increase in hotwell level will be attributed to leakage in the HPCI Gland Seal Condenser tubing. A minimum 10 min hold time will be observed for this test.

The licensee stated that these tests will be performed once each period to meet the requirements in Table IWC-2500-1 for IWC-5221 and IWC-5222 tests.

<u>Evaluation</u>: The Code requires a VT-2 visual examination of the HPCI Lube Oil Cooler and Gland Seal Condenser tubing during pressure testing. Component design, however, prevents accessibility for performance of the required examinations, making the Code requirement impractical at Dresden Station. To perform the examinations to the extent required by the Code, these two heat exchangers would have to be redesigned.

The licensee's proposed alternative involves analysis of the HPCI lube oil and hotwell level monitoring in the Gland Seal Condenser. The oil analysis is capable of detecting a water content as low as .01%; any increase in Gland Seal Condenser hotwell level will be attributed to leakage. These alternatives will provide a reasonable assurance of the continued inservice structural integrity of the subject components because both methods can furnish qualitative leakage information.

Conclusion: The Code-required VT-2 visual examination of the HPCI Lube Oil Cooler and Gland Seal Condenser tubing is impractical at Dresden Station. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.3 Class 3 System Pressure Tests

3.4.3.1 Request for Relief No. PR-05, Paragraph IWD-5223(b), Alternate Test Level for Isolation Condenser (Shell Side) Hydrostatic Test

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B requires a VT-2 visual examination during system functional and hydrostatic tests of Class 3 pressure-retaining components. Paragraph IWD-5223(b) states that in the case of atmospheric storage tanks, the nominal hydrostatic pressure developed with the tank filled to its design capacity shall be acceptable as the system test pressure.

Licensee's Code Relief Request: The licensee requested relief from the requirements for testing the shell side of the Isolation Condenser at the design capacity level.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

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

Although the shell side of the condenser is designed for 25 psig, the system is normally operated with the Isolation Condenser water at a level between 5 and 7 ft (Technical Specifications require a minimum level of 11,300 gallons, which corresponds to a level of approximately 4 ft). The licensee feels that it is impractical to fill the Isolation Condenser to the top because it would require an additional 20,000 gallons to fill (assuming an initial level of 20,000 gals.). This water would have to be drained and processed as radwaste. In addition to the water processing requirements, filling the Isolation Condenser to the top would require a temporary plant alteration to disable the high-level switch on the Isolation Condenser.

The 3.0 psig difference in pressure between the Isolation Condenser filled to the top vs. the minimum operating level is so slight that a test with the Isolation Condenser filled to the normal operating level is essentially the same as a test with the Isolation Condenser filled to the top.

Licensee's Proposed Alternative Examination: The licensee proposed that the Isolation Condenser and associated piping in Test Block 13A2 will be VT-2 visually examined with the level between 5.0 and 7.0 feet.

Evaluation: The Code requires that atmospheric storage tanks be filled to design capacity for the system hydrostatic test. As stated by the licensee, the Isolation Condenser does not have a design capacity level. Because the Isolation Condenser is a horizontal vessel 12 ft in diameter that is vented to the atmosphere, it is impractical to achieve design pressure with a static head. The licensee proposes to perform a VT-2 visual examination with the Isolation Condenser filled to normal operating level. The difference in pressure cited by the licensee is 3.0 psig (filled vs. minimum operating level). The problems associated with pressure testing above the normal operating level and processing of the radwaste represent a hardship.

Conclusion: The Code requirement to fill the Isolation Condenser to the top for hydrostatic testing is impractical for Dresden Station. The licensee's proposed testing provides reasonable assurance of operational readiness for the subject system because the difference in test pressure is only 3 psig. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.3.2 Request for Relief No. PR-07, Examination Category D-B, Item D2.10, Pressure Testing Frequency for the Isolation Condenser Shell Side Vent Line

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B, Item D2.10 requires that a system functional pressure test (IWD-5222) be conducted to verify operability in systems (or components) not required to operate during normal plant operations. This test must be performed once each inspection period.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required system functional pressure test once each inspection period.

Licensee's Basis for Requesting Relief: The licensee stated:

"The Isolation Condenser is vented to the outside of the reactor building through a nonisolable 32" diameter line (see Figure PR-07.1*). The only time that this vent line experiences a flow condition is during the actual operation of the Isolation Condenser. The only scheduled surveillance in which the Isolation Condenser System is operated is the Isolation Condenser heat removal capability test, which is performed once every five years.

*Figure PR-07.1 is not included in this document.

It is impractical to perform this test more frequently. Past performance of this test has resulted in low level release of contamination outside the reactor building through the Isolation Condenser vent line. In addition, the condenser is designed for a limited number of operational cycles. More frequent operation of the system will contribute to the reduction of life of the Isolation Condenser. Note that the performance of an Isolation Condenser heat removal capability test every five years conforms to the requirements stated in the Technical Specifications."

Licensee's Proposed Alternative Examination: The licensee proposed to visually examine the Isolation Condenser vent line twice in the third interval (every 5 years) as opposed to three times (once each inspection period).

Evaluation: The Code requires a system functional test to be performed each inspection period. The Technical Specifications require an Isolation Condenser heat removal capability test to be performed once every five years. The potential for low-level releases of contamination during performance of the additional (third) test creates a hardship without a compensating increase in the level of quality and safety. In addition, the system was designed for a limited number of operating cycles, therefore, a lower testing frequency conserves the system's life. The licensee's alternative, performing the system testing at the Technical Specification frequency (twice per interval), will provide reasonable assurance of the system's operational readiness because this vent line only experiences flow during operation of the Isolation Condenser.

Conclusion: Pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that the proposed limited examination be authorized.

3.4.3.3 Request for Relief No. PR-08, Paragraph IWA-5265(b), Hydrostatic Testing at 106% of the Specified System Test Pressure

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B requires a VT-2 visual examination during system functional and hydrostatic tests of Class 3 pressure-retaining components. Paragraph IWA-5265(b) requires a pressure-measuring instrument to be connected to a point in the pressure boundary, such that the imposed pressure on any component, including static head, will not exceed 106% of the specified test pressure in the system. Paragraph IWD-5223(a) states that the system hydrostatic test pressure shall be at least 1.10 times the system pressure, P_{sv}, for systems with design temperatures of 200°F or less.

Licensee's Code Relief Request: The licensee requested relief from the Code-required hydrostatic test pressure for systems where the elevation change causes the pressure at lower elevations to exceed 106% of the required test pressure.

Licensee's Basis for Requesting Relief: The licensee stated:

"Due to the relatively low design pressure and large elevation change in the subject systems, it is impossible to pressurize the highest elevation in the Test Block to the specified test pressure without pressurizing the lower elevations above 106% of this pressure.

In order to adhere to the limitations of IWA-5265(b) and to allow margin for pressure control, it will be necessary to test the upper elevations of the piping at a reduced pressure. This reduced pressure testing will only be performed when no other isolation is available that would reduce the elevation change experienced in a Test Block."

Licensee's Proposed Alternative Examination: The subject Test Blocks will be hydrostatically tested such that the pressure at the lowest point in the Test Block will equal 105% (±1%) of the Code-required test pressure (1.10 x P_{sv}).

Evaluation: The Code states that the imposed pressure on any component, including static head, will not exceed 106% of the specified test pressure. If the test boundary high point undergoes the hydrostatic test at a pressure as close to the Code-required test pressure as possible without exceeding 106% of system test pressure at the test boundary low point, the Code requirements are met. This is illustrated by Code Interpretation XI-1-89-66.

Conclusion: Because the intent of the Code is being met, relief is not required.

3.4.3.4 Request for Relief No. PR-10, Paragraph IWD-5223(a), Reduced Test Pressure for the Containment Cooling Service Water (CCSW) Side of the Low Pressure Coolant Injection (LPCI) Heat Exchanger

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B requires a VT-2 visual examination during system functional and hydrostatic tests of Class 3 pressure-retaining components. Paragraph IWD-5223(a) states that the system hydrostatic test pressure shall be at least 1.10 times the system pressure, P_{sv}, for systems with a design temperature of 200°F or less. It also states that the system pressure, P_{sv}, shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested (or Design Pressure, P_d, if overpressure protection is not provided).

Licensee's Code Relief Request: The licensee requested relief from performing a Code-required hydrostatic test of the tube side of the LPCI heat exchanger at a pressure equal to the system relief valve setpoint for Test Blocks 15J3 and 15J4 for each unit.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The design pressure for the CCSW piping, including the piping up to the nozzle on the heat exchanger, is 300 psig. This design pressure represents the maximum total dynamic head capacity for the CCSW pumps. The LPCI heat exchanger, however, was purchased with a tube side design pressure (maximum allowable working pressure) of 375 psig. Because the heat exchanger is an ASME Section VIII pressure vessel, it is required to have a relief device with a capability of preventing the pressure in the heat exchanger from rising more than 10% above its maximum allowable working pressure. To meet this requirement, the heat exchanger has a relief valve with a set point of 393 psig. No other relief valve is located within the boundary of piping that will be pressurized during this test.

The licensee's interpretation of the Code requirement is that the hydrostatic testing of the test block would have to be performed at a minimum pressure of 432.3 psig, 1.44 times the design pressure of the piping attached to the heat exchanger. Because the design pressure of the piping represents the maximum dynamic head capacity of the CCSW pumps, a test performed at 1.10 times this pressure would adequately challenge the piping and the heat exchanger, without exceeding the limits for pressurization set forth in Section XI (based on P_d) for the piping attached to the heat exchanger.

Licensee's Proposed Alternative Examination: The licensee stated that a hydrostatic test will be conducted at a pressure not less than 1.10 times the design pressure of the piping attached to the LPCI heat exchanger (330 psig).

Evaluation: The Code requires that the system hydrostatic test be performed at a pressure at least 1.10 times the system pressure. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. The CCSW piping has a design pressure of 300 psig. To test this system to a pressure significantly above the design pressure of the system's "weakest link" is impractical. Imposition of the Code requirement would necessitate redesigning the CCSW system piping and would cause a burden on the licensee.

The proposed alternative is to conduct a system hydrostatic test at a pressure not less than 1.10 times the design pressure of the piping attached to the LPCI heat exchanger (330 psig). This provides a reasonable assurance of the continued inservice integrity of the subject system because the test is performed at 1.10 times the design pressure of the system's weakest link.

Conclusion: Pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.3.5 Request for Relief No. PR-13, Paragraph IWD-5223(a), Alternate Testing for Local Instrumentation Requiring Isolation During System Hydrostatic Testing

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B requires a VT-2 visual examination during system functional and hydrostatic tests of Class 3 pressure-retaining components. Paragraph IWD-5223(a) states that the system hydrostatic test pressure shall be at least 1.10 times the system pressure, P_{sv}, for systems with a design temperature of 200°F or less. It also states that the system pressure, P_{sv}, shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested (or Design Pressure, P_d, if overpressure protection is not provided).

Licensee's Code Relief Request: The licensee requested relief from performing a Code-required hydrostatic test of the following instruments.

Unit 2

INSTRUMENT NUMBER	TEST BLOCK NUMBER
PI 2-3941-32	39B1
PI 2-3941-31	39I1
PI 2-3941-30	39I1

Unit 2/3

INSTRUMENT NUMBER	TEST BLOCK NUMBER
PI 2/3-3941-32	39B2
PI 2/3-3941-31	39E2
PI 2/3-3941-30	39E2

Unit 3

INSTRUMENT NUMBER	TEST BLOCK NUMBER
PI 3-3941-32	39B1
PI 3-3941-31	39I1
PI 3-3941-30	39I1

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The instruments listed above have a maximum gauge indication or maximum working pressure less than the test pressure required during hydrostatic testing. To prevent damage to these instruments, they must be isolated during hydrostatic tests. None of these instruments perform a safety function. However, they do provide a pressurization boundary during normal system operation. All of the instruments have root valves available, but these valves are normally open and do not have means for automatic closure.

Licensee's Proposed Alternative Examination: The licensee proposed to perform a VT-2 visual examination on the instruments listed during a system functional test. This visual examination will be of the piping from the instrument up to and including the instrument root valve.

Evaluation: The system hydrostatic test shall be at a pressure 1.10 times the system pressure for systems with a design temperature of 200°F or less. The licensee proposes a system functional test in lieu of the hydrostatic pressure test for the subject instruments. Performance of the hydrostatic test to the Code-required test pressure could damage the instruments and is, therefore, impractical. To perform the hydrostatic test at the

Code-required test pressure, the instrumentation would have to be replaced, causing a burden on the licensee.

Conclusion: It is concluded that the Code-required hydrostatic pressure test of the subject instrumentation is impractical. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted with the understanding that the remainder of the instrumentation lines (up to the isolable instrument root valve) will receive the Code-required hydrostatic test.

3.4.3.6 Request for Relief No. PR-16, Examination Category D-B, Item D2.10, Pressure Testing of Main Steam (MS) Safety and Relief Valve Discharge Piping

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B, Item D2.10 requires a System Pressure Test and/or a System Hydrostatic Test to be performed. IWD-5223(f) states that for safety or relief valve piping that discharges into the containment pressure suppression pool, a pneumatic test (at a pressure of 90% of the pipe submergence head of water) that demonstrates leakage integrity shall be performed in lieu of the system hydrostatic test.

Table IWD-2500-1 requires that a system functional test in accordance with IWD-5222 be performed once each period for all Class 3 piping.

Licensee's Code Relief Request: The licensee requested relief from performing a VT-2 visual examination of the Main Steam Relief Valve discharge piping once each period at nominal operating pressure, and from performing a pneumatic test at 90% submergence head on the same lines.

Licensee's Basis for Requesting Relief: The licensee stated:

"The discharge lines on the one Target Rock and four Electromatic relief valves for each Unit at Dresden discharge into the Suppression Chamber. The discharge lines terminate in a T-Quencher that is normally submerged. Each of the discharge lines also contains two vacuum breakers, one 8" diameter vacuum breaker and one 1" diameter vacuum breaker.

The physical design of the system prevents performance of a complete and meaningful pneumatic test (in accordance with IWD-5223(f)) for the following reasons:

- The Electromatic Relief Valve pilot assembly cannot be pressurized from the discharge side due to a labyrinth type seal on the stem of the pilot valve disc. This seal will not prevent the leakage of air from the discharge line and therefore, would prevent the performance of a flow make-up or pressure decay pneumatic test of the entire relief valve discharge line.

- The design of the Target Rock internals includes several seating surfaces that may provide a path for leakage when pressurized from the discharge line. Because no through wall leakage in piping is acceptable, the acceptance criteria for such a piping integrity test must be zero leakage (within the accuracy of the instruments used). The smallest seat leakage would cause a failure of the test. Since the purpose of the test is to determine the integrity of the relief valve discharge line and not the quality of the pilot valve seating surface, leakage in the Target Rock Valve pilot seats would give misleading test results.

- No test taps are currently available on the line to allow for the proper pressurization of the relief valve discharge line during testing and for the depressurization of the line upon completion of testing.

- The vacuum breakers are not designed to provide a leak tight seal at such low pressures and therefore, provide another leakage path that would prevent the performance of a meaningful test.

In addition to the design restrictions which prevent complete testing, the test itself gives very little assurance of the integrity when one considers the test conditions. For Dresden Unit 2 and Unit 3, 90% of the T-Quencher submergence head corresponds to a pressure of approximately 4 psig. The design pressure of the relief valve discharge lines is 550 psig. Therefore, a test at 4 psig does not significantly challenge the piping.

Functional testing of the Main Steam Relief Valves is performed once each operating cycle by manually opening the relief valves with the reactor vessel at a pressure between 950 and 1000 psig. During this testing, the relief valve discharge line is challenged by a pressure much closer to the design pressure. The radiation levels in the drywell at the power levels associated with relief valve functional testing are prohibitive and prevent drywell entry by plant personnel. Therefore, a VT-2 examination cannot be performed during the pressurization of the line during relief valve functional testing. Although the line cannot be visually examined during functional testing, significant leaks in the line would be detected by an increase in drywell pressure during the test. In addition, a visual examination of the discharge line performed once each period would verify the integrity of the discharge line."

Licensee's Proposed Alternative Examination: The licensee proposed that a visual examination of the Relief Valve Discharge lines be performed once each inspection period. This examination will be performed to detect evidence of cracks, wear, corrosion, erosion, or physical damage on the surface of the piping and components that comprise the Main Steam Relief Valve Discharge System.

Evaluation: The Code states that a pneumatic test that demonstrates leakage integrity shall be performed in lieu of the system hydrostatic test once each interval, and a system functional test with associated VT-2 visual examination shall be performed once each period. The system design, however, prevents a complete and meaningful pneumatic test, and drywell conditions during power levels associated with relief valve functional testing prevent VT-2 visual examination. These Code requirements are, therefore, impractical at Dresden Station. To meet the Code requirements, the system would have to be redesigned, causing a burden on the licensee.

Functional testing of the Main Steam Relief Valves will assure an unobstructed flow, and the visual examination of the Relief Valve Discharge lines will detect evidence of leakage. This will provide a reasonable assurance of the continued structural integrity of the subject lines.

Conclusion: Based on the impracticality of complying with the Code requirements and considering the proposed testing, it is recommended that, pursuant to 10 CFR 50.55a(g)(6)(i), relief be granted as requested.

3.4.4 General

3.4.4.1 Request for Relief No. PR-01, Examination Categories B-P, C-H, and D-B, Alternate Pressure Testing Item Numbers

Code Requirement: Section XI, Table IW(B,C)-2500-1, Examination Categories B-P and C-H item numbers are subdivided into system pressure testing (operational) and system hydrostatic testing (static). Static and operational testing are further subdivided based on the type of component examined.

Class 3 pressure testing categories and item numbers are subdivided by system function.

Licensee's Code Relief Request: The licensee requested relief from categorizing the Class 1, 2, and 3 components in accordance with the item numbers found in Examination Categories B-P, C-H, and D-B for system pressure testing.

Licensee's Basis for Requesting Relief: The licensee stated:

"The organization of the ASME Section XI item numbers is not representative of the way in which system pressure testing is actually performed. All Class 1 and 2 components (i.e., vessels, piping, pumps, and valves) are tested concurrently when the Test Block is tested. The examination requirements for each component type identified in the Code are identical, so there is no need for separate "component type" based item numbers.

Similarly, the examination requirements for all Class 3 systems are identical so there is no need for separate system based item numbers.

Tracking and reporting inspections performed during pressure testing in accordance with the organization currently provided by the Code represents a hardship for the following reasons:

- A listing of components requiring inspection separated by category and item number, for Class 1 and Class 2 systems, would consist of separate line lists, valve lists, pump lists, and vessel lists. Because components are inspected during pressure testing in a "flow order", this type of list is of no use to an inspector trying to ensure that a comprehensive examination is performed in the field. The use of separate category and item numbers based on component type would require the use of five controlled lists; one for valves, one for piping, one for pumps, one for vessels, and the flow order walkdown checklist used by the inspector for documenting the extent of his examination. The administrative time required to control five lists, and to ensure that the four component lists agree with the flow order walkdown checklist the inspector uses represents a hardship without corresponding increase in quality. This can be illustrated by considering the reactor vessel hydrostatic test which includes inspection of approximately 500 valves and over 300 different lines. Utilizing one item number for all components of the same Class, as proposed by this relief request, does not change the level of quality or safety provided because it does not change any examination requirements. These requirements do not vary based on item number. Utilizing one item number would also facilitate auditing of the program by providing one controlled list, the inspectors walkdown checklist, for review to ensure that all components are being inspected.

- Section XI does not provide separate item numbers for hydrostatic testing and operational testing (system inservice and system functional testing) for Class 3 systems even though the requirements for these tests are very different. Because the current Code provides no differentiation between the two, in terms of item numbers, tracking and reporting of these tests by the current category and item number would not ensure that the proper requirements have been satisfied.

<u>Licensee's Proposed Alternative Examination</u>: The licensee proposed to use the following categories and item numbers to control the System Pressure Testing Program.

ISI CLASS	CATEGORY	ITEM NUMBER HYDROSTATIC	ITEM NUMBER OPERATIONAL
Class 1	B-P	B15.ST	B15.OT
Class 2	C-H	C7.ST	C7.OT
Class 3	D-B	D2.ST	D2.OT

Evaluation: The Code identifies specific item numbers under each of the pressure testing examination categories for administration of the program. The licensee would prefer to use a single item number to distinguish between operational and static pressure tests for each Code classification. It should be noted that input from the utilities was used in establishing Code categories, item numbers, and examination area descriptions to assure uniform reporting.

The administrative control of an ISI program can be as flexible as the licensee feels necessary, provided the tests and reporting requirements of the Code are met. The licensee could create a system to satisfy the Code using their own internal tracking system. Thus, the impracticality of meeting these Code requirements has not been identified.

Conclusion: Disagreement with a Code requirement is not justification for granting relief. Therefore, it is recommended that relief be denied.

3.4.4.2 Request for Relief No. PR-02, Paragraph IWB-5221(a), System Leakage Test Pressure for the Disassembly and Reassembly of Class 1 Mechanical Connections in the Reactor Drywell

Code Requirement: Section XI, Paragraph IWB-5221(a) states that the system leakage test following the opening and reclosing of a component in the system [IWA-5211(a)] shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated reactor power.

Licensee's Code Relief Request: The licensee requested relief from the requirements for the system leakage test pressure (100% rated reactor power) when performing the Code-required system leakage tests of reassembled, unisolable Class 1 mechanical connections located in the drywell.

Licensee's Basis for Requesting Relief: The licensee stated:

"The nominal operating pressure associated with 100% rated reactor power is 1005 psig. Near the end of each refueling outage, a system pressure test of all Class 1 pressure retaining components is conducted at 1005 psig.

Subsequent to the system pressure test conducted during a refueling outage, or during forced maintenance outages which can occur during an operating cycle, it may become necessary to disassemble and reassemble Class 1 mechanical connections that are located in the drywell and cannot be isolated from the reactor vessel. For these situations, the performance of a Class 1 system leakage test at 1005 psig would have a significant impact on the unit's critical path outage time and personnel exposure.

The normal Class 1 system pressure test, which is performed with the vessel flooded up, requires numerous equipment outages (e.g., approximately 380 valves must be taken out-of-service and Main Steam safety valves must be gagged). Performance of the equipment outages, coupled with the performance of the system leakage test, takes approximately 5 days (3 shifts per day) with a total personnel exposure of approximately 2.5 Man-Rem.

Performance of a system leakage test during normal startup is possible, however, the test can not be performed at 1005 psig. During unit startup, the Electro-Hydraulic Control System precludes a reactor pressure above 950 psig without significant increases in reactor power. In order to achieve a pressure of 1005 psig, the reactor would have to be at approximately 100% rated power. The radiation levels in the drywell at this power level are prohibitive, and prevent drywell entry by plant personnel.

A drywell entry to inspect for leakage can be performed at 920 psig, which is associated with approximately 15% reactor power. Performance of the leakage test in this manner would have an insignificant impact on the ability to detect leakage from a reassembled mechanical connection. It would also significantly reduce the personnel exposure and critical path outage time required for the test."

Licensee's Proposed Alternative Examination: The licensee proposed to perform a system leakage test at 920 psig (approximately 15% reactor power) during unit startup when an unisolable Class 1 mechanical connection in the drywell has been disassembled and reassembled either: 1) subsequent to performance of the system pressure test conducted near the end of each refueling outage; or 2) during a forced maintenance outage in the course of an operating cycle.

Evaluation: Paragraph IWB-5221(a) requires that system leakage tests be performed at a test pressure not less than the nominal operating pressure associated with 100% rated reactor power. The licensee performs the system leakage test near the end of each refueling outage at the Code-required pressure. The licensee has not provided an explanation of how the performance of the pressure test following a refueling would differ from a system pressure test at operating pressure following the reassembly of a Class 1 mechanical joint. It appears that relief is being requesting from a Code-required system pressure test on a generic basis. Relief from pressure tests associated with reassembled, nonisolable Class 1 mechanical connections should be addressed on a case-by-case basis.

Conclusion: The licensee has not provided the technical justification to support the impracticality of the Code requirement. Further, the proposed alternative examination does not provide the same level of assurance of system integrity as a test pressure equivalent to the system operating pressure. Therefore, it is recommended that relief be denied.

3.4.4.3 Request for Relief No. PR-14, Paragraph IWA-4700(a), Alternate Testing for ISI Class 1 and 2 Repaired/Replaced Components

Code Requirement: Section XI, Paragraph IWA-4700(a) requires an elevated pressure hydrostatic test to be performed after welded repair/replacement of Code Class 1, 2, and 3 components, except those exempted by IWA-4700(b).

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required elevated pressure hydrostatic tests on Class 1 and 2 repaired/replaced components.

Licensee's Basis for Requesting Relief: The licensee stated:

"Elevated pressure hydrostatic tests are difficult to perform and often represent a true hardship. Some of the difficulties associated with elevated pressure testing include the following:

- Hydrostatic testing often requires complicated or abnormal valve line-ups in order to properly vent, fill and isolate the component requiring testing.
- Relief valves with setpoints lower than the hydrostatic test pressure must be gagged or removed and blind flanged. This process requires the draining and refilling of the system.
- Valves that are not normally used for isolation (e.g., normally open pump discharge valves) are often required to provide pressure isolation for an elevated pressure hydrostatic test. These valves frequently require time consuming seat maintenance in order to allow for pressurization.
- The radiation exposure required to perform a hydrostatic pressure test is high (in comparison to operational pressure testing) due to the large amount of time required to prepare the volume for testing (i.e., installing relief valve gags, performing appropriate valve line-ups, etc).

The difficulties encountered in performing a hydrostatic pressure test are prohibitive when weighed against the benefits. Industry experience, which is corroborated by Dresden Station's experience, shows that most through wall leakage is detected during system operation as opposed to during elevated pressure tests such as ten-year system hydrostatic tests.

Little benefit is gained from the added challenge to the piping system provided by an elevated pressure hydrostatic test (when compared to an operational test), especially when one considers that the piping stress experienced during a hydrostatic test does not include the quite significant stresses affiliated with the thermal growth and dynamic loading associated with design basis events.

These arguments are supported by the adoption of Code Case N-498, "Alternate Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division 1". This relief request is a natural extension of that Code Case."

Licensee's Proposed Alternative Examination: The licensee proposed to perform a VT-2 visual examination with the Class 1 or 2 repaired/replaced component pressurized to nominal operating pressure. This visual examination will be performed after nominal operating pressure has been held for 4 hours for insulated components and 10 minutes for noninsulated components.

Evaluation: The Code requires that a system hydrostatic pressure test be performed after welding on the pressure-retaining boundary, except as exempted by IWA-4700(b). Based on existing code cases, a repair hydrostatic test may be deferred until a more convenient time during the interval; however, in no case can the repair hydrostatic test be eliminated. The licensee is suggesting generic relief from a Code requirement. If a repair/replacement penetrates the pressure boundary, the system hydrostatic pressure test is required to provide assurance of structural integrity.

Conclusion: Based on the generic nature of this relief request, with no systems or components being specifically identified, it is recommended that relief be denied.

3.5 General

3.5.1 Ultrasonic Examination Techniques

3.5.1.1 Request for Relief No. CR-04, Appendix III, Paragraph III-3411, Calibration Block Material Specification Requirements

Code Requirement: Section XI, IWA-2232 states that ultrasonic examination shall be conducted in accordance with Appendix I.

Appendix I, I-2200 states that ultrasonic examination of vessel welds less than 2 inches thick and all piping welds shall be conducted in accordance with Appendix III, as supplemented by Appendix I.

Appendix III, Paragraph III-3411 requires calibration blocks to be fabricated from the same material specification as the piping being joined by the weld. It also states that if material of the same specification is not available, material of similar chemical analysis, tensile properties, and metallurgical structure may be used.

Licensee's Code Relief Request: The licensee requested relief from the Appendix III, Paragraph III-3411, requirements for calibration block material specifications.

Licensee's Basis for Requesting Relief: The licensee stated:

"Several of the calibration blocks currently being used at Dresden Station lack the documentation necessary to demonstrate compliance with the material specification requirements of Appendix III. This is because the documentation requirements existing at the time of their fabrication did not require traceability to the material's chemical or physical certification. Consequently, the only documentation available for these existing calibration blocks is verification of the appropriate P-number grouping.

It would be impractical to fabricate a new set of calibration blocks in order to satisfy the documentation requirements of the current Code. Existing records, which indicate the appropriate P-number grouping, provide adequate assurance that the blocks will establish the proper ultrasonic calibration and sensitivity. In addition, the blocks meet all other requirements of Appendices I and III."

Licensee's Proposed Examination: The licensee stated that when using existing calibration blocks that lack the appropriate documentation, a comparison will be made between the attenuation of the calibration block and the material being examined.

Evaluation: The material specification documentation required by the 1989 Edition was not required by the original fabrication code. The procurement of calibration blocks of the same materials would be difficult, if not impossible, making the Code requirement impractical. The original calibration blocks were fabricated based on P-number groupings. The licensee has committed to compare the attenuation of the calibration block with that of the material being examined. However, a comparison of material velocities should also be performed. With this additional comparison, adequate assurance will be provided that the existing blocks will establish the proper ultrasonic calibration and sensitivity.

Conclusion: The procurement of new calibration blocks to satisfy current Code requirements is impractical for Dresden Station and imposition of this requirement would create a burden on the licensee. In addition, public health and safety will not be endangered by allowing the continued use of the existing calibration blocks. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted provided a comparison of material velocities and attenuation is completed during calibration.

3.5.1.2 Request for Relief No. CR-09, Paragraph IWA-2311(b), Appendix VII Ultrasonic Examination Personnel Qualification Requirements

Code Requirement: Section XI, Paragraph IWA-2311(b) requires that the training, qualification, and certification of ultrasonic examination (UT) personnel complies with the requirements specified in Appendix VII.

Appendix VII addresses requirements for the employer's written practice, qualification of ultrasonic examiners, qualification records, and the minimum content of initial training courses for the ultrasonic examination method.

Licensee's Code Relief Request: The licensee requested relief from the Appendix VII requirements for the qualification of nondestructive examination personnel for ultrasonic examination.

Licensee's Basis for Requesting Relief: The licensee stated:

"Appendix VII represents a dramatic change from previous Code editions and current industry practices in the requirements for qualification of UT personnel. For instance, new training programs must be developed and taught by trained instructors, employer's written practices must be completely rewritten, examination question banks must be developed, and specimen banks of at least 15 specimens (with 5 containing actual or simulated flaws) must be developed and purchased.

Implementation of this Appendix will require a substantial industry effort. Although the industry is currently working towards compliance with Appendix VII, full implementation is still on-going. In fact, since Appendix VII allows for the use of specimens prepared for UT performance demonstrations per Appendix VIII, many NDE vendors are developing these two programs simultaneously in order to avoid purchasing dual specimens.

In order to properly implement Appendix VII criteria, the Commonwealth Edison Company is in the process of establishing an internal program to ensure compliance. The Commonwealth Edison Company commits to having their program in place by December 31, 1994, at which time Dresden Station will fully comply with the requirements of Appendix VII. Until this time, Dresden will maintain the current levels of quality and safety by continuing to invoke all other requirements of IWA-2300 for the qualification of ultrasonic examination personnel."

Licensee's Proposed Alternative Examination: Until December 31, 1994, Dresden Station's UT personnel will be qualified in accordance with the requirements of IWA-2300, with the exception of IWA-2311(b). Additionally, personnel performing UT on IGSCC susceptible welds will be qualified in accordance with the latest EPRI guidelines.

Evaluation: The Code requires that training, qualification, and certification of ultrasonic examination personnel comply with the requirements specified in Appendix VII. The licensee is requesting that these requirements be postponed until December 31, 1994, due to the hardship associated with implementation. The licensee will use ultrasonic examination personnel qualified in accordance with the requirements of IWA-2300, with the exception of IWA-2311(b) (implementation of Appendix VII).

Dresden Station has chosen to use the 1989 Edition and is, therefore, one of the initial plants required to implement Appendix VII. Simultaneous development of Appendix VII and Appendix VIII would be economically advantageous. To require full compliance with these contemporary qualification requirements without sufficient time allotted for implementation would result in hardship without a compensating increase in the level of quality and safety.

Conclusion: It is concluded that implementation of the Appendix VII requirements for the qualification of ultrasonic examination personnel would result in hardship or unusual difficulty without simultaneous implementation of Appendix VIII. Allowing the licensee until December 31, 1994 will provide sufficient time to implement Appendix VII. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that the proposed alternative be authorized as requested only until December 31, 1994.

3.5.2 Exempted Components (No relief requests)

3.5.3 Other

3.5.3.1 Request for Relief No. CR-06, Examination Category F-A, Items F1.10 through F1.70, Component Support Item Numbers

Code Requirement: Section XI, Table IWF-2500-1, Examination Category F-A, Items F1.10 through F1.70 require a VT-3 visual examination of component supports as defined by Figure IWF-1300-1.

Licensee's Code Relief Request: The licensee requested relief from using the Code item numbers that appear in the 1989 Edition, Table IWF-2500-1, Examination Category F-A.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The purpose of this relief request is to improve the method of tracking the inservice inspection of Class 1, 2 and 3 component supports by simplifying the identification of code items as listed in the 1989 Edition. The licensee feels that the organization of the ASME Section XI item numbers is not representative of the way in which component support examinations are actually performed. Each of the portions and attributes identified in Table IWF-2500-1 are considered to be part of the component support assembly, and are examined concurrently. In addition, the examination requirements for each of these portions and attributes are identical, so there is no need for separate item numbers. The numbering system listed in the 1989 Edition creates an additional administrative burden that is an inefficient use of ISI resources. Making these changes to the item numbers will not affect the examination requirements or acceptance criteria.

The licensee has committed to inspecting 100% of the component supports and integral attachments within their ISI boundaries. This commitment far exceeds the safety and quality requirements of the Code. Changing the code item numbering system will improve the tracking mechanisms needed to meet this commitment. In addition, Dresden Station has established computer tracking capabilities that will further assist in the monitoring of component support inspections. The combination of the computer tracking system and the numbering system stated in this relief request will simplify the maintenance of the ISI Program and improve the quality of internal and external audits.

<u>Licensee's Proposed Alternative Examination</u>: The licensee proposed to use the following item numbers to identify component supports:

Class 1 Component Supports: F1.CS
Class 2 Component Supports: F2.CS
Class 3 Component Supports: F3.CS

The proposed item numbers meet the intent of the Code because the examination requirements, examination method, acceptance standard, extent, and frequency of examination remain unchanged.

<u>Evaluation</u>: Table IWF-2500-1 is divided into seven item numbers under one examination category for administration of the ISI program. Each code item number describes a portion or attribute of a component support. The licensee would prefer to use three item numbers to distinguish between the Code classifications of integral attachments. This request is seeking relief from administrative requirements of the Code. It should be noted that input from the utilities was used when establishing code categories, item numbers, and examination area descriptions to assure uniform reporting.

The administrative control of an ISI Program can be as flexible as the licensee feels necessary, provided the tests and reporting requirements of the Code are met. The licensee can create a system to satisfy the Code using their own internal tracking system. Thus, the impracticality of meeting these Code requirements has not been identified.

<u>Conclusion</u>: Disagreement with a Code requirement is not justification for granting relief. Therefore, it is recommended that relief be denied.

3.5.3.2 <u>Request for Relief No. CR-10, Examination Category D-B, Items D2.20 through D2.60, Integral Attachment Item Numbers</u>

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B, Items D2.20 through D2.60 require a VT-3 visual examination of integral attachments as defined by Figure IWD-2500-1.

Licensee's Code Relief Request: The licensee requested relief from using the code item numbers that appear in the 1989 Edition, Table IWD-2500-1, Examination Category D-B.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

The purpose of this relief request is to improve the method of tracking the inservice inspection of Class 3 integral attachments by simplifying the identification of code items as listed in the 1989 Edition. The licensee feels that the organization of the ASME Section XI item numbers is not representative of the way in which integral attachment examinations are actually performed. Class 3 integral attachments are examined concurrently with their corresponding component support, regardless of the support type. Additionally, the examination requirements for each of these integral attachments of each support type are identical, so there is no need for separate item numbers. The numbering system listed in the 1989 Edition creates an additional administrative burden that is an inefficient use of ISI resources. Making these changes to the item numbers will not affect the examination requirements or acceptance criteria.

The licensee has committed to inspecting 100% of the component supports and integral attachments within their ISI boundaries. This commitment far exceeds the safety and quality requirements of the Code. Changing the code item numbering system will improve the tracking mechanisms needed to meet this commitment.

In addition, Dresden Station has established computer tracking capabilities that will further assist in the monitoring of integral attachment inspections. The combination of the computer tracking system and the numbering system stated in this relief request will simplify the maintenance of the ISI Program and improve the quality of internal and external audits.

It is stated that the proposed alternative item numbers meet the intent of the Code because the examination requirements, examination method, acceptance standard, extent, and frequency of examination remain unchanged.

Licensee's Proposed Alternative Examination: The licensee proposed to use item number "D2.IA" to identify all Class 3 integral attachments.

Evaluation: The Code identifies six specific item numbers under Examination Category D-B for administration of the ISI program. The licensee would prefer to use a single item number to distinguish between the different types of Class 3 integral attachments. It should be noted that input from the utilities was used when establishing code categories, item numbers, and examination area descriptions to assure uniform reporting.

The administrative control of an ISI Program can be as flexible as the licensee feels necessary, provided the tests and reporting requirements of the Code are met. The licensee can create a system to satisfy the Code using their own internal tracking system. Thus, the impracticality of meeting these Code requirements has not been identified.

Conclusion: Disagreement with a Code requirement is not justification for granting relief. Therefore, it is recommended that relief be denied.

3.5.3.3 Request for Relief No. CR-11, Articles IW(A,B,C)-4000, IW(A,B,C)-5000, and IW(A,B,C)-7000, Use of 1989 Addenda for Repairs, System Pressure Tests or ISI Requirements for Snubbers, and Replacements

NOTE: In the December 4, 1992 response to the NRC's request for additional information, the licensee withdrew Relief Request No. CR-11 pending approval of the 1989 Addenda.

3.5.3.4 Request for Relief No. CR-16, Article IWA-4000, Exemption of Piping, Valves and Fittings NPS 1 and Smaller, and Their Associated Supports

Code Requirement: Section XI, Paragraph IWA-4700 exempts welded repairs on the pressure-retaining boundary of component connections, piping, and associated valves that are NPS 1 and smaller from hydrostatic testing.

Licensee's Code Relief Request: The licensee requested relief to exempt piping, valves, and fittings NPS 1 and smaller, and their associated supports, from the requirements of Article IWA-4000.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized as follows.

Paragraph IWA-7400 exempts small-bore piping components (NPS 1 and smaller) from Section XI replacement requirements, while IWA-4700 exempts small-bore piping components from hydrostatic testing after repairs. However, Article IWA-4000 (Repair Procedures) does not specifically identify the items that are exempt from the requirements of the Article.

The licensee feels that application of the IWA-4000 requirements to piping, valves and fittings NPS 1 and smaller (including requirements for repair plans, NIS-2 forms, etc.) creates an additional administrative burden that does not provide a compensating increase in the level of quality or safety. This is illustrated by the fact that IWA-7400 would allow the Owner to cut out and replace piping, valves and fittings NPS 1 and smaller without applying any Code requirements.

Licensee's Proposed Alternative Examination: To ensure that existing quality and safety levels are maintained, repair activities on piping, valves and fittings NPS 1 and smaller, and their associated supports, will be conducted in accordance with the Commonwealth Edison Company Quality Assurance Program, which implements the criteria of 10 CFR 50, Appendix B.

Evaluation: IWA-4110(b) states that the rules and requirements of this Article shall apply to the attaching of items to be used for replacement (as defined in IWA-7110) to the system where such attachment is by welding. IWA-7110 states, in part, "Replacement includes the addition of components, such as valves, and system changes, such as rerouting of piping, within the scope of this Division." The licensee's contention that the Owner could cut out and replace piping, valves and fittings NPS 1 and smaller without applying any Code requirements is not in accordance with IWA-4110(b). Whenever a repair or replacement involves welding, the rules of IWA-4000, Repair Procedures, apply.

Conclusion: Based on the above, it is recommended that relief be denied.

5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.

2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:
   1989 Edition
   1974 Edition through Summer 1975 Addenda

3. *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 0, dated February 18, 1992.

4. NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, Section 3.2.2, Appendix A, "Classification of Main Steam Components other than the Reactor Coolant Pressure Boundary for BWR Plants," Section 5.2.4, "Reactor Coolant Boundary Inservice Inspection and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components," July 1981.

5. Letter, dated October 6, 1992, B. L. Stiegel (NRC) to T. J. Kovach (Commonwealth Edison Company), containing request for additional information on the Third 10-Year Interval ISI Program Plan.

6. Letter, dated December 4, 1992, P. L. Piet (CECo) to T. E. Murley (NRC), containing the response to the NRC's request for additional information and Revision 1 to the *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan.*

7. Letter, dated June 23, 1993, J. F. Stang (NRC) to D. L. Farrar (Commonwealth Edison Company), containing request for additional information on the Third 10-Year Interval ISI Program Plan.

8. Letter, dated August 13, 1993, P. L. Piet (CECo) to T. E. Murley (NRC), containing the response to NRC request for additional information.

9. *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 2, dated August 13, 1993.

10. Letter, dated January 28, 1992, R. Barrett (NRC) to T. Kovach (CECo) regarding the use of the 1989 Edition of the ASME Section XI Code.

11. Regulatory Guide (RG) 1.26, *Quality Group Classification and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants*, Revision 3, February 1976.

12. NRC Generic Letter 88-01, *NRC Position on Intergranular Stress Corrosion Cracking in BWR Austenitic Stainless Steel Piping*, January 25, 1988.

13. NUREG-0313, *Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping*, Revision 2, January 1988.

14. NUREG-0619, *BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking*, November 1980.

15. NRC Regulatory Guide 1.150, *Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations*, Revision 1, February 1983.

16. NUREG/CR-3052 (Closeout of IE Bulletin 80-07), *BWR Jet Pump Assembly Failure*, November 1984.

4. CONCLUSIONS

Pursuant to 10 CFR 50.55a(g)(6)(i), it has been determined that certain inservice examinations cannot be performed to the extent required by Section XI of the ASME Code. In those cases where the licensee has demonstrated that specific Section XI requirements are impractical, it is recommended that relief be granted. The granting of relief will not endanger life, property, or the common defense and security, and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. In the case of Request for Relief No. CR-04, it is recommended that relief only be granted with the conditions stated in the evaluation.

Pursuant to 10 CFR 50.55a(a)(3), it is concluded that in certain cases, the licensee's proposed alternative to the Code-required examination provides an acceptable level of quality and safety. In these cases, it is recommended that the proposed alternative be authorized. The alternative for Request for Relief No. CR-09 should only be considered effective until December 31, 1994.

For Requests for Relief Nos. CR-06, CR-10, CR-16, PR-01, PR-02, and PR-14, it is concluded that the licensee has not provided sufficient information to support the determination that the Code requirement is impractical, and that requiring the licensee to comply with the Code requirement would not result in hardship. Therefore, relief is denied. Requests for Relief Nos. CR-07, CR-11, CR-13, and CR-15, were withdrawn by the licensee and deleted from the ISI Program Plan. It has also been determined that for Request for Relief No. PR-08, relief is not required.

This technical evaluation has not identified any practical method by which the licensee can meet all the specific inservice inspection requirements of Section XI of the ASME Code for the existing Dresden Nuclear Power Station, Units 2 and 3. Compliance with all the required Section XI inspections would necessitate redesign of a significant number of plant systems, procurement of replacement components, installation of the new components, and performance of baseline examinations for these components. Even after the redesign efforts, complete compliance with the Section XI examination requirements probably could not be achieved. Therefore, it is concluded that the public interest is not served by imposing certain provisions of Section XI of the ASME Code that have been determined to be impractical. Pursuant to 10 CFR 50.55a(g)(6), relief is allowed from the requirements that are impractical to implement, or alternatively, pursuant to 10 CFR 50.55a(a)(3), alternatives to the Code-required examinations may be authorized provided that either (i) the proposed alternatives provide an acceptable level of quality and safety or that (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety.

The licensee should continue to monitor the development of new or improved examination techniques. As improvements are achieved, the licensee should incorporate these techniques in the ISI program plan examination requirements.

The review of the *Dresden Nuclear Power Station, Units 2 and 3, Third 10-Year Interval Inservice Inspection Program Plan*, Revision 2, the licensee's response to the NRC's request for additional information, and the recommendations for granting relief from the ISI examination requirements that have been determined to be impractical has been completed. The review results showed compliance with the Code, except for the issues discussed in paragraph 2.2.2 of this report. The licensee should review these items and make changes to the ISI Program where appropriate. These changes should include the volumetric and surface examinations required by the Code for Class 2 piping systems for the portions of the main steam system between the outboard containment isolation valves and the turbine stop and bypass valves. In addition, the portion of the RHR system feeding the RPV head spray should also receive the Code-required Class 2 volumetric and surface examinations.