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TECHNICAL EVALUATION REPORT

TECHNICAL EVALUATION REPORT ON THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN: DUQUESNE LIGHT COMPANY, BEAVER VALLEY POWER STATION, UNIT 1, DOCKET NUMBER 50-334

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EG&G Idaho

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Prepared for the U.S. NUCLEAR REGULATORY COMMISSION

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ABSTRACT

This report presents the results of the evaluation of the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, Revision 1, submitted August 11, 1989, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the Licensee has determined to be impractical. The Beaver Valley Power Station, Unit 1, Second 10-Year Interval ISI Program Plan is evaluated in Section 2 of this report 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 previous Nuclear Regulatory Commission (NRC) reviews. The requests for relief are evaluated in Section 3 of this report.

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Operating Reactor Licensing Issues Program,
Review of ISI for ASME Code Class 1, 2, and 3 Components

SUMMARY

The Licensee, Duquesne Light Company, has prepared the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, Revision 1, to meet the requirements of the 1983 Edition, Summer 1983 Addenda of the ASME Code Section XI except that the extent of examination for Code Class 1 piping welds is based on the 1974 Edition, Summer 1975 Addenda as permitted by 10 CFR 50.55a(b). The extent of examination for Code Class 2 piping welds has been determined by the ASME Code Case N-408, "Alternative Rules for Examination of Class 2 Piping." ASME Code Case N-408 has been approved for use by NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." The second 10-year interval began September 21, 1987 and ends September 21, 1997.

The information in the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan, Revision 1, submitted August 11, 1989, was reviewed. Included in the review were the requests for relief from the ASME Code Section XI requirements that the Licensee has determined to be impractical. As a result of this review, a request for additional information was prepared describing the information and/or clarification required from the Licensee in order to complete the review. The Licensee provided additional information in submittals dated April 20, 1990 and June 25, 1990.

Based on the review of the Beaver Valley Power Station, Unit 1, Second 10-Year Interval ISI Program Plan, Revision 1, the Licensee's responses to the Nuclear Regulatory Commission's request for additional information, and the evaluation of requests for relief from the Section XI examination requirements that have been determined to be impractical, it is concluded that the Beaver Valley Power Station, Unit 1, Second 10-Year Interval ISI Program Plan, Revision 1, with the exception of Request for Relief BV1-B9.31-1, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

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SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN:
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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 shall 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, Duquesne Light Company, has prepared the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, Revision 1, to meet the requirements of the 1983 Edition, Summer 1983 Addenda of the ASME Code Section XI except that the extent of examination for Class 1 piping welds is based on the 1974 Edition, Summer 1975 Addenda as permitted by 10 CFR 50.55a(b). The extent of examination for Code Class 2 piping welds has been determined by ASME Code Case N-408, "Alternative Rules for Examination of Class 2 Piping." ASME Code Case N-408 has been approved for use by NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." The second 10-year interval began September 21, 1987 and ends September 21, 1997.

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 justifications 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 determinations that Code requirements are impractical; alternatively, pursuant to 10 CFR 50.55a(a)(3), the licensee must demonstrate that either (i) the proposed alternatives would provide an acceptable level of quality and safety or that (ii) code compliance would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. The NRC may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life or 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.

The information in the Beaver Valley Power Station, Unit 1, Second 10-Year Interval ISI Program Plan, Revision 1 (Reference 3), submitted August 11, 1989, 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 March 1, 1990 (Reference 5), the NRC requested additional information that was required in order to complete the review of the ISI Program Plan. The requested information was provided by the Licensee in a letter dated April 20, 1990 (Reference 6). In this response, the Licensee withdrew four relief requests, revised three relief requests, and provided information with regard to augmented examinations, calibration blocks, and the exemption of welds in the containment heat removal (CHR) system. A complete set of Beaver Valley, Unit 1, isometric drawings showing the components, piping welds, and supports that Section XI of the ASME Code requires to be examined during the second 10-year inspection interval was also provided.

As a result of a telephone conversation with the Licensee on May 18, 1990, the Licensee forwarded additional revisions to the ISI Program in a submittal dated June 25, 1990 (Reference 7). In these revisions the Licensee withdrew nine relief requests, added two new relief requests, and included supplemental examination tables for Class 2 piping welds in the quench spray and recirculation spray systems (containment heat removal systems).

The Beaver Valley Power Station, Unit 1, Second 10-Year Interval ISI Program Plan is evaluated in Section 2 of this report 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 previous NRC 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, 1983 Edition, Summer 1983 Addenda. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

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

2.1 Documents Evaluated

Review has been completed on the following information provided by the Licensee:

(a) Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan, Revision 1, submitted August 11, 1989 (Reference 3);

(b) Letter (Reference 6), dated April 20, 1990, response to the NRC request for additional information dated March 1, 1990 (Reference 5);

(c) Revisions to the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program contained in the April 20, 1990 submittal (Reference 6);

(d) Letter (Reference 7), dated June 25, 1990, providing the additional information requested by the NRC in a telephone conference call on May 18, 1990; and

(e) Revisions to the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program contained in the June 25, 1990 submittal (Reference 7).

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 starting date of September 21, 1987, the Code applicable to the second interval ISI program is the 1983 Edition, Summer 1983 Addenda of the Code. As stated in Section 1 of this report, the Licensee has written the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan to meet the requirements of this Edition and Addenda of the Code, except that the extent of examination for Code Class 1 piping welds is based on the 1974 Edition, Summer 1975 Addenda as permitted by 10 CFR 50.55a(b) and the extent of examination for Code Class 2 piping welds has been determined by ASME Code Case N-408, "Alternative Rules for Examination of Class 2 Piping, Section XI, Division 1." ASME Code Case N-408 has been approved for use by NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (Reference 8).

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).

In the NRC request for additional information, the Licensee was requested to confirm that a representative sampling of welds in the containment heat removal (CHR) system will be examined during the second 10-year inspection interval. The Licensee responded that the CHR system at Beaver Valley is a part of the recirculation spray and quench spray systems. Piping welds in these CHR systems were not scheduled for ISI examination as the piping is greater than 4-inch nominal pipe size but less than 3/8-inch nominal wall

thickness. However, as a result of the May 18, 1990 conference call, the Licensee committed (Reference 7) to perform supplemental ISI examinations on a representative sampling of welds in the recirculation spray and quench spray systems.

Based on the review of the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan and the Licensee's commitment to examine CHR system welds, it has been determined that the sample size and weld selection have been implemented in accordance with Section XI of the ASME Code, ASME Code Case N-408, and 10 CFR 50.55a(b) and appear to be correct.

2.2.3 Exclusion Criteria

The criteria used to exclude components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, and IWD-1220, and 10 CFR 50.55a(b). ASME Code Case N-408 has been implemented, which provides alternative exemptions for Class 2 piping and replaces IWC-1220. The exclusion criteria have been applied by the Licensee in accordance with the Code as discussed in the ISI Program and appear to be correct.

2.2.4 Augmented Examination Commitments

In addition to the requirements as specified in Section XI of the ASME Code, the Licensee has committed to perform the following augmented examinations:

(a) The reactor coolant pump flywheel will be examined per NRC Regulatory Guide 1.14, "Reactor Coolant Pump Flywheel Integrity" (Reference 9);

(b) The reactor pressure vessel welds will be examined per NRC Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," Revision 1 (Reference 10); and

(c) Supplemental ISI examinations on a representative sampling of welds in the recirculation spray and quench spray systems.

2.3 Conclusions

Based on the review of the documents listed above, it is concluded that the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan, Revision 1, with the additional information and commitments submitted by the Licensee, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements that the Licensee has determined to be impractical for the second 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 Relief Request BV1-B1.20-1 (Rev. 1), Examination Category B-A, Reactor Pressure Vessel Head Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.20 requires a volumetric examination of the accessible lengths of the reactor pressure vessel (RPV) head welds as defined by Figure IWB-2500-3.

Licensee's Code Relief Request: Relief is requested from examining 100% of the following reactor pressure vessel head circumferential and meridional welds:

Lower Head	Closure Head
RC-R-1-C-9	RC-R-8-C-6
RC-R-1-L-10	RC-R-8-L-01
RC-R-1-L-11	RC-R-8-L-02
RC-R-1-L-12	RC-R-8-L-03
RC-R-1-L-13	RC-R-8-L-04
RC-R-1-L-14	
RC-R-1-L-15	
RC-R-1-C-16	

Licensee's Proposed Alternative Examination: During the 10-year interval, all accessible areas between the penetrations and the conduits will receive volumetric examination to the maximum extent practical.

Licensee's Basis for Requesting Relief: The examination of the welds in the lower head is restricted from inside the vessel by the location of the adjacent incore instrumentation penetrations.

Approximately 15 inches of each closure head meridional weld is accessible for volumetric examination. The remainder of each weld is enclosed within the pattern of the control rod drive mechanism (CRDM) penetrations. Furthermore, the closure head disc weld is completely enclosed within the pattern of the CRDM penetrations inside the shroud and is not accessible for examination.

Evaluation: The incore instrumentation penetrations, CRDM penetrations, and shroud prevent the subject RPV head welds from being fully examined. The lower and closure head design, therefore, make the volumetric examination of the subject welds impractical to perform to the extent required by the Code. The Code acknowledges these interferences by requiring only that the accessible lengths of these welds be examined. In order to examine these welds 100%, the lower and closure heads, and thus the reactor vessel, would have to be redesigned, fabricated, and installed. Imposition of a 100% volumetric examination would cause a burden that would not be compensated significantly by an increase in safety above that provided by the limited examination.

The Licensee has stated that the volumetric examination of these welds will be performed to the maximum extent practical. The percentage of the Code-required volumetric examination which the Licensee has committed to perform is consistent with plants of similar design. The limited volumetric examination will provide adequate assurance that unallowable inservice flaws have not developed in the welds or that they will be detected and removed or repaired prior to the return of the reactor vessel to service.

Conclusions: It is concluded that the Licensee is meeting the Code requirements by performing the volumetric examination on all accessible lengths of the subject welds. Therefore, relief is not required.

3.1.2 Pressurizer

3.1.2.1 Relief Request BV1-B3.120-1 (Rev. 1), Examination Category B-D, Pressurizer Nozzle Inside Radius Sections

NOTE: In the April 20, 1990 response to the NRC request for additional information, the Licensee withdrew Relief Request BV1-B3.120-1 (Rev. 1) based on an evaluation of specialized techniques and the determination that the required examinations can be performed with newly purchased qualification/calibration blocks and with specialized search units and procedures.

3.1.3 Heat Exchangers and Steam Generators

3.1.3.1 Relief Request BV1-B3.140-1 (Rev. 1), Examination Category B-D, Steam Generator Nozzle Inside Radius Sections

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.140 requires a 100% volumetric examination of the steam generator nozzle inside radius sections as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the following steam generator nozzle inside radius sections:

RC-E-1A-RADIUS-1H	RC-E-1A-RADIUS-1C
RC-E-1B-RADIUS-1H	RC-E-1B-RADIUS-1C
RC-E-1C-RADIUS-1H	RC-E-1C-RADIUS-1C

Licensee's Proposed Alternative Examination: Visual examination of the nozzle inside radius sections will be performed using remote video techniques on the interior surface.

Licensee's Basis for Requesting Relief: The Licensee states that the configuration of the nozzle to steam generator at the inner radius section is such that 100% interrogation by ultrasonic techniques is not possible for the following reasons: (a) constantly changing geometry on the outside surface will make it difficult to correlate the search unit position with the inside surface sound beam impingement point; (b) thickness variations in nozzle sections would require a unique calibration standard capable of encompassing the metal path required to reach the inner radius sensitivity reflectors representative of anticipated critical flaw size; and (c) as-welded clad surface and nozzle dam retaining rings cause spurious reflectors.

Evaluation: In the April 20, 1990 response to the NRC request for additional information, the Licensee discussed the attempts to perform the preservice examinations prior to licensing. The volumetric examination of the nozzle inside radius sections was considered impractical for the following reasons: (a) the as-cast surface does not permit consistent coupling, (b) the search unit movement was also obstructed by insulation attachment pads; and (c) a calibration standard is not available to encompass the constantly changing metal path, contact surface curvature, and the calibration reflector. (The only meaningful qualification/calibration standard envisioned would be an actual channel head of the same design with calibration reflectors installed in the Code-required volume.)

Based on review of the Licensee's submittals, including the sketch of the subject nozzles, a "best-effort" examination would not be sufficiently meaningful to justify the radiation doses associated with the examination. In order to examine the nozzle inside radius sections in accordance with the requirements, the steam generator nozzles, and thus the steam generators, would have to be redesigned, fabricated, and installed. Imposition of the requirement on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

Duquesne Light Company's proposed alternative is to perform a visual examination of the nozzle inside radius sections using remote video techniques on the interior surface. This examination will provide reasonable assurance that unallowable inservice flaws have not developed in the steam generator nozzle inner radius sections or that they will be detected and removed or repaired prior to the return of the steam generators to service.

Conclusions: It is concluded that the volumetric examination required by Section XI of the ASME Code for the steam generator nozzle inside radius sections is impractical to perform at Beaver Valley, Unit 1. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.3.2 Relief Request BV1-B5.70-1 (Rev. 2), Examination Category B-F, Steam Generator Nozzle-to-Safe End Butt Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-F, Item B5.70 requires both 100% volumetric and surface examinations of the steam generator nozzle-to-safe end butt welds as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of the following steam generator nozzle-to-safe end butt welds:

DLW-LOOP1-2-F-04	DLW-LOOP1-3-F-05
DLW-LOOP2-2-F-16	DLW-LOOP2-3-F-17
DLW-LOOP3-2-F-28	DLW-LOOP3-3-F-29

Licensee's Proposed Alternative Examination: None. The Code-required volumetric examination will be performed to the maximum extent practical and the Code-required 100% surface examination will be performed.

Licensee's Basis for Requesting Relief: The Licensee reports that the arrangements and details of the piping system and components are such that the volumetric examination, as required by the Code, is limited due to geometric configuration or accessibility. The surface on the pipe side of the weld, which is a cast elbow, is machined for a distance of approximately 3 inches from the surface edge of the weld. Ultrasonic examinations can be performed on the surface of the weld but are severely limited from the nozzle side by the rough as-cast surface. Surface examinations can be performed on 100% of the required area.

Evaluation: Due to the steam generator nozzle geometric configuration and as-cast surface, the subject welds cannot be fully examined. The steam generator nozzle design, therefore, makes the volumetric examination impractical to perform to the

extent required by the Code. In order to examine the welds in accordance with the Code requirement, the steam generator nozzles, and thus the steam generators, would require extensive design modifications. Imposition of the requirement on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

However, partial volumetric examinations of the nozzle safe end butt welds, in addition to the full Code-required surface examination, can and will be performed. Based on the reported limiting features, a significant percentage (60 to 70%) of the Code-required volume will be examined. These examinations will provide adequate assurance that unallowable inservice flaws have not developed in the nozzle-to-safe end welds or that they will be detected and removed or repaired prior to the return of the steam generators to service.

Conclusions: It is concluded that the volumetric examination of the subject steam generator nozzle-to-safe end welds is impractical to perform at Beaver Valley, Unit 1, to the extent required by Section XI of the ASME Code. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.4 Piping Pressure Boundary

3.1.4.1 Relief Request BV1-B9.11-1 (Rev. 1), Examination Category B-J, Class 1 Circumferential Piping Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.11 requires both 100% volumetric and

surface examinations of pressure retaining Class 1 piping welds (4-inch or greater nominal pipe size) as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from examining the following Class 1 piping welds to the extent required by the Code:

Weld Number	Code-required Volume Examinable	Code-required Surface Examinable
RC-71-1-S-04	60%	60%
DLW-LOOP1-9-F-42	71%	100%

Licensee's Proposed Alternative Examination: None. The Code-required volumetric and surface examinations will be performed to the maximum extent practical.

Licensee's Basis for Requesting Relief: Ultrasonic and surface examinations are limited on weld RC-71-1-S-04 due to welded attachments on the weld. Ultrasonic examination of weld DLW-LOOP1-9-F-42 is limited due to adjacent welded attachments. As identified above, the examinations will be performed to the maximum extent practical.

Evaluation: Welded attachments on and adjacent to the subject welds prevent the subject Class 1 piping welds from being fully examined. The system design, therefore, makes the required examinations of these welds impractical to perform to the extent required by the Code. In order to examine these welds in accordance with the requirements, the piping would require design modifications. Imposition of the requirements on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

A significant percentage of the Code-required examinations can and will be completed. Complete examinations that meet the

requirements of Section XI will be performed on welds of similar configuration using the same inspection techniques, equipment, and procedures as these partially inspected welds. Since the partially inspected welds will see the same operating and environmental conditions as the inspected welds, a reasonable assurance of the structural integrity of the welds for which relief is requested will be provided.

Conclusions: It is concluded that the required examinations of the subject Class 1 piping welds are impractical to perform at Beaver Valley, Unit 1, to the extent required by Section XI of the ASME Code. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.4.2 Relief Request BV1-B9.12-1 (Rev. 0), Examination Category B-J, Class 1 Longitudinal Elbow Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.12 requires both 100% surface and volumetric examinations of pressure retaining longitudinal welds in Class 1 piping systems, 4-inch and larger nominal pipe size, as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the following primary coolant loop longitudinal elbow welds:

DLW-LOOP1-4-L-01	DLW-LOOP1-4-L-02
DLW-LOOP1-5-L-03	DLW-LOOP1-5-L-04
DLW-LOOP2-4-L-01	DLW-LOOP2-4-L-02
DLW-LOOP2-5-L-03	DLW-LOOP2-5-L-04
DLW-LOOP3-4-L-01	DLW-LOOP3-4-L-02
DLW-LOOP3-5-L-03	DLW-LOOP3-5-L-04

Licensee's Proposed Alternative Examination: None. These welds will be receiving the Code-required surface examination and visual examination during the system pressure tests.

Licensee's Basis for Requesting Relief: The Licensee reports that the 90-degree elbows in the crossover leg of the reactor coolant system are fabricated in two halves from austenitic stainless steel castings welded together by the electroslag process. The structure of the material is such that ultrasonic examinations cannot be performed as required by the Code.

Evaluation: As the Licensee has stated, the materials of fabrication (cast austenitic stainless steel) and the welding process (electroslag) are not conducive to an effective ultrasonic examination. Because of the component/weld design, the Code-required volumetric examination of these electroslag longitudinal piping welds is impractical to perform. In order to perform the volumetric examination of the subject welds, the elbows would have to be redesigned, fabricated, and installed. Imposition of the requirement on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the Code-required surface examination. No major problems have been reported in the industry with regard to reactor coolant system elbows of this type. The Code-required surface examination of these welds will provide reasonable assurance of the continued inservice structural integrity.

Conclusions: It is concluded that the Code-required volumetric examination of the subject welds is impractical to perform at Beaver Valley, Unit 1. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.4.3 Relief Request BV1-B9.31-1 (Rev. 1), Examination Category B-J, Class 1 Branch Connection Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.31 requires both 100% volumetric and surface examinations of Class 1 branch connection welds as defined by Figures IWB-2500-9, -10, and -11.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of the following Class 1 branch connection welds:

Weld Numbers
DLW-LOOP1-7-S-05
DLW-LOOP2-1-S-03
DLW-LOOP3-1-S-04
DLW-LOOP3-7-S-06

Licensee's Proposed Alternative Examination: None. The Code-required 100% surface examination will be performed and the Code-required volumetric examination will be performed to the maximum extent practical.

Licensee's Basis for Requesting Relief: The Licensee reports that ultrasonic examination of these reactor coolant system branch nozzle connection welds is limited by both the configuration and the material type.

Evaluation: In the NRC request for additional information, the Licensee was advised that the staff has recently noted significant improvements in the techniques being used by other Licensees for the volumetric examination of branch connections. The Licensee was requested to discuss what efforts have been made to perform the Code-required volumetric examination from the branch connection side of the subject welds and list the percentage of the Code-required volumetric examination that can and will be performed for each of the subject welds.

In the April 20, 1990 response to the NRC request for additional information, the Licensee stated that specialized techniques are being evaluated that may allow meaningful examinations on these welds. However, it was requested that, until such a time when these techniques are demonstrated meaningful, the request for relief should still stand. If limitations are encountered during the examinations, the details of the limitations will be provided by the Licensee at that time. The Licensee stated that, if no limitations are encountered, the relief request will be withdrawn.

The Licensee has not provided sufficient information to justify the determination of impracticality. Until such time that the Licensee provides detailed technical justifications, relief should not be granted.

Conclusions: It is concluded that the Code requirement for volumetric examination of the subject welds has not been demonstrated to be impractical. Therefore, it is recommended that relief be denied.

3.1.5 Pump Pressure Boundary

3.1.5.1 Relief Request BV1-B12.10-1 (Rev. 1), Examination Categories B-L-1 and B-L-2, Class 1 Pump Casing Welds and Internal Surfaces

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-L-1, Item B12.10 requires a 100% volumetric examination of the Class 1 pump casing welds as defined by Figure IWB-2500-16. Examination Category B-L-2, Item B12.20 requires a VT-3 visual examination of Class 1 pump casing internal surfaces. These examinations can be deferred until the end of the interval.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the reactor coolant pump casing welds and from the VT-3 visual examination of the pump casing internal surfaces unless the pump is disassembled for maintenance during the interval. This request for relief is applicable for reactor coolant pumps RC-P-1A, RC-P-1B, and RC-P-1C.

Licensee's Proposed Alternative Examination: As an alternative to the volumetric examination of the casing welds, the exterior of the pump casing will be visually examined during pressure tests as required by IWB-5000 and a surface examination will be performed on the weld of the selected reactor coolant pump (RCP).

The VT-3 visual examination of the internal surfaces of the pump will be performed only when the pump is disassembled for maintenance.

Licensee's Basis for Requesting Relief: The required examinations of the RCP casing weld and casing internal surface require the complete disassembly of the RCP. Complete disassembly of an RCP would result in large expenditures of manpower and a substantial increase in radiation exposure. Also, possible damage to the pump could occur since these pumps were not designed for ease of disassembly in the field.

The volumetric examination of the casing weld is extremely difficult. The inherent coarse grain structure of ASTM A351 Grade CF8 material precludes meaningful ultrasonic examination with present technology. The combination of surface radiation levels and material thickness precludes use of conventional radiographic techniques, leaving only high-curie Cobalt 60 or MINAC as possible alternatives.

RCP casing examinations performed by other plants have shown no evidence of cracks or surface degradation.

Significant pump degradation would be detected by abnormalities in pump parameters, i.e., pump vibration, bearing temperature, and seal flow, and by RCS leakage.

The Licensee further states that, considering the technical difficulty, radiation exposure, cost, and possible damage resulting from pump disassembly, along with past industry results of RCP casing examinations and the continuously monitored pump parameters that would detect pump degradation, it is concluded that the required examinations will not provide a compensating increase in the level of safety to justify such examinations.

Evaluation: The examination requirement for internal surfaces of pumps necessitates complete disassembly of the pump. The disassembly of the reactor coolant pumps for the sole purpose of visual examination of the casing internal surfaces and volumetric examination of the pump casing weld is a major effort and requires many manhours from skilled maintenance and inspection personnel. In order to examine the internal surfaces and casing weld of a reactor coolant pump in accordance with the requirements, complete disassembly of the pump would be required which, in addition to the possibility of damage to the pump, would result in personnel receiving excessive radiation exposure. Therefore, the Code requirement is impractical. The visual examination is performed to determine if unanticipated degradation of the casing is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous experience during examination of similar pumps at other plants has not shown any significant degradation of pump casings. Imposition of the requirements on Duquesne Light Company would cause a burden that would not be

compensated significantly by an increase in safety above that provided by the proposed examination.

Duquesne Light Company's proposed alternative is as follows: (a) VT-3 visual examination of the internal surfaces of the pumps will be performed whenever the internal surfaces are made accessible due to disassembly for maintenance, (b) surface examination of the selected pump casing weld outside diameter will be performed, and (c) visual examination of the exterior of the pump casing will be performed during pressure tests as required by IWB-5000.

Later editions and addenda of the ASME Code ('88 Addenda) have eliminated disassembly of pumps for the sole purpose of performing examinations of the internal surfaces and state that the internal surface visual examination requirement is only applicable to pumps that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the pump casing, if the pump is disassembled for maintenance, is acceptable. Since no major problems have been reported in the industry with regard to pump casings, the Licensee's proposal will provide adequate assurance of the continued inservice structural integrity.

ASME Code Case N-481 states alternatives to the volumetric examination requirement for cast austenitic pump casings. It appears that the code case will be approved in Revision 9 of NRC Regulatory Guide 1.147, pending final review and evaluation by the NRC staff, for generic use with the stipulation that surface examination of the pump casing weld outside diameter be performed if the pump has not been disassembled during the interval. Since the Licensee's proposed alternative examination includes surface examination of the pump casing weld outside diameter, the supplemental requirement will be met. However, in addition to the Licensee's commitments, any

other requirements listed in Code Case N-481 should also be met and, if a pump is completely disassembled such that the weld is exposed and volumetric examination of the weld is possible, the Licensee should perform the volumetric examination. It should be noted that other Westinghouse plants that have requested this same relief have committed to perform the Code-required volumetric examination of the pump casing weld if the pump is disassembled for maintenance.

Conclusions: It is concluded that the disassembly of a pump for the sole purpose of inspections required by Section XI of the ASME Code is impractical to perform at Beaver Valley, Unit 1. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted provided that: (a) the requirements listed in ASME Code Case N-481 are also met, (b) the Code-required volumetric examination of the pump casing weld is performed whenever the pump is completely disassembled such that the weld is exposed and volumetric examination is possible, and (c) if the pump has not been disassembled, this fact should be reported by the Licensee in the ISI Summary Report at the end of the interval.

3.1.6 Valve Pressure Boundary

3.1.6.1 Relief Request BV1-B12.50-1 (Rev. 0), Examination Category B-M-2, Class 1 Valve Bodies

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-M-2, Item B12.50 requires a VT-3 visual examination of the internal surfaces of valve bodies exceeding 4-inch nominal pipe size. This examination is limited to one valve

within each group of valves that are of the same design and manufacturing method, and that perform similar functions in the system. This examination can be deferred until the end of the interval.

Licensee's Code Relief Request: Relief is requested from performing the required VT-3 visual examination of the subject valve bodies unless they are disassembled for maintenance.

Licensee's Proposed Alternative Examination: The VT-3 visual examination will be deferred until valve disassembly is required for maintenance.

Licensee's Basis for Requesting Relief: The Licensee reports that the design of the valves is such that disassembly is required to perform the examination. Based on past performance of these valves and the service history of stainless steel valves, the requirement to disassemble one valve of each design type for the purpose of visual examination has a small probability of identifying service-induced flaws or degradation. The Licensee further states that the required examination would result in unnecessary exposure and cost is therefore not justified.

Evaluation: The visual examination is performed to determine if unanticipated degradation of the valve body is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous experience during examination of similar valves at other plants has not shown any significant degradation of valve bodies.

The examination requirement for internal surfaces of valve bodies necessitates complete disassembly of the valve. The disassembly of the subject valves for the sole purpose of visual examination of the valve body internal surfaces is a major effort and requires many manhours from skilled

maintenance and inspection personnel. To examine the internal surfaces of a valve body in accordance with the requirements, complete disassembly of the valve is necessary which, in addition to the possibility of damage to the valve, could result in personnel receiving excessive radiation exposure. Imposition of this requirement on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

Duquesne Light Company has stated that the Code-required visual examination will be performed on the internal pressure boundary surface when valve disassembly is required for maintenance.

Later editions and addenda of the ASME Code (1988 Addenda) have eliminated disassembly of valves for the sole purpose of performing examinations of the internal surfaces and state that the internal surface visual examination is only for valves that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the valve body, when the valve is disassembled for maintenance, is acceptable.

Conclusions: It is concluded that the disassembly of a valve for the sole purpose of inspection is a significant burden at Beaver Valley, Unit 1, and that compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that relief be granted provided that, if the valve has not been disassembled, this fact should be reported by the Licensee in the ISI Summary Report at the end of the interval.

3.1.7 General (No relief requests)

3.2 Class 2 Components

3.2.1 Pressure Vessels

3.2.1.1 Relief Request BV1-IWC-C-A (Rev. 0), Non-Regenerative Heat Exchanger and Integrally Welded Attachments

NOTE: In the June 25, 1990 submittal, Relief Request BV1-IWC-C-A was withdrawn in response to the NRC's request for additional technical justification.

3.2.1.2 Relief Requests BV1-C1.10-1, BV1-C1.10-3, BV1-C1.20-1, and BV1-C1.20-2 (all Rev. 1), Examination Category C-A, Seal Water Heat Exchanger, Seal Water Return Filter, and Reactor Coolant Filter Shell and Head Welds

NOTE: In the June 25, 1990 submittal, Relief Requests BV1-C1.10-1, BV1-C1.10-3, BV1-C1.20-1, and BV1-C1.20-2 were withdrawn in response to the NRC's request for additional technical justification.

3.2.1.3 Relief Request BV1-C1.10-2 (Rev. 1), Examination Category C-A, Regenerative Heat Exchanger Shell Welds

NOTE: In the June 25, 1990 submittal, Relief Request BV1-C1.10-2 was withdrawn in response to the NRC's request for additional technical justification.

3.2.1.4 Relief Requests BV1-C1.10-4 and BV1-C1.20-3 (both Rev. 1), Examination Category C-A, Seal Water Injection Filter Head and Shell Welds

NOTE: In the June 25, 1990 submittal, Relief Requests BV1-C1.10-4 and BV1-C1.20-3 were withdrawn in response to the NRC's request for additional technical justification.

3.2.1.5 Relief Request BV1-C3.10-1 (Rev. 0), Examination Category C-C, Seal Water Injection Filter, Seal Water Injection Filter, Seal Water Heat Exchanger, and Reactor Coolant Filter Integrally Welded Attachments

NOTE: In the June 25, 1990 submittal, Relief Request BV1-C3.10-1 was withdrawn in response to the NRC's request for additional technical justification.

3.2.1.6 Relief Request BV1-CH-E-2-1 (Rev. 0), Examination Categories C-A and C-C, Non-Regenerative Heat Exchanger Welds and Welded Attachments

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-A, Items C1.10 and C1.20 require a 100% volumetric examination of pressure retaining welds in Class 2 vessels as defined by Figure IWC-2500-1. Examination Category C-C, Item C3.10 requires a 100% surface examination of integrally welded attachments to Class 2 vessels as defined by Figure IWC-2500-5.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of non-regenerative heat exchanger (NRHX) vessel welds C-1 and C-2 and from performing the Code-required surface examinations on the integrally welded attachments to the heat exchanger.

Licensee's Proposed Alternative Examination: None. The Code-required VT-2 visual examination will be performed during the system leak tests each 40-month period.

Licensee's Basis for Requesting Relief: The Licensee reports that the general radiation level in the area of the NRHX is 350 mRem/hr and contact readings are 2 Rem/hr. These readings are based on a May 8, 1990 survey. The manrem estimate to prepare, inspect, and reinstate these welds is projected by the Licensee to be 18.5 Rem.

The Licensee also reports that remote examination in this situation is not practical because of the configuration of the component (endcap-to-vessel, flange-to-vessel, supports, etc.) and that shielding is not practical since the source of radiation is the component to be examined.

The Licensee further states that the required examinations are of limited value because component geometry limits the volumetric examination of welds C-1 and C-2 to one side only. The endcap-to-vessel weld (C-1) cannot be examined from the endcap side and the flange-to-vessel weld (C-2) cannot be examined from the flange side. In addition, the proximity of the vessel supports, inlet and outlet nozzles and weld crown further limit the one-sided examination by limiting search unit approach distance.

Several mechanisms are available to detect leakage:

(a) The control room operators perform Operating Surveillance Test (OST) 1.6.2, "Reactor Coolant System Water Inventory Balance" every three days when the plant is operating at steady state conditions. Leakage through the subject welds would be detected by this OST.

(b) The inventory in the liquid waste system is logged daily. Since leakage from these welds would be collected by the liquid waste system, a through-wall leak would be apparent in this inventory. Radiation monitors within the liquid waste system would also detect any leakage from these welds.

(c) Monthly, the Radiological Control Department personnel enter the cubicle to perform radiation surveys. Seepage (not detectable by OST 1.6.2 or the liquid waste inventory) would be detected during this survey.

(d) OST 1.48.2, "High Energy Line and ECCS Inspection," is performed quarterly. This visually examines accessible high energy lines outside on containment for degradation of welds on high energy systems (the NRHX is included).

The NRHX is readily isolable should a leak occur. The NRHX has double-valve isolation from the primary system and is automatically isolated on a pressurizer low level signal. It could be easily isolated by the control room operators should one of the welds be discovered to be leaking.

Evaluation: We concur that the general radiation level in the area of the NRHX is significantly high and poses ALARA concerns. However, the Licensee's manrem estimate to prepare, inspect, and reinsulate these welds (18.5 Rem), as supplied in the Table attached to the relief request, seems to the reviewer to be significantly inflated. As an example, the surface examination (PT) of the four welded attachments was estimated to require two inspectors two hours of exposure in a 500 mR/hr field (a total estimated exposure of 2000 mR). Another example is the estimate of two carpenters needing six hours (for an estimated total exposure of 4200 mR) to construct scaffolding and two carpenters another three hours (2100 mR) to remove the scaffolding.

As the Licensee has stated, remote examination in this situation is not practical because of the configuration of the components, and shielding is not practical since the source of radiation is the component being examined. The Code-required volumetric examinations would be of limited value because of the component geometry.

Previous ultrasonic examinations performed on these welds during the first ten-year interval detected no recordable indications.

Based on the ALARA considerations and the component configurations as described above, the Code-required surface and volumetric examinations on the subject NRHX welds are impractical to perform. Because these welds are subject to routine monitoring during plant operation, weld degradation sufficient to cause a through-wall leak would be detected in a timely manner, and because the NRHX is readily isolable should a leak occur, reasonable assurance of continuing plant safety is maintained.

Conclusions: It is concluded that the Code-required volumetric examination of the subject non-regenerative heat exchanger welds and the Code-required surface examination of the subject integrally welded attachments are impractical to perform at Beaver Valley, Unit 1. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.1.7 Relief Request BV1-CH-E-3-1 (Rev. 0), Examination Category C-A, Regenerative Heat Exchanger Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-A, Items C1.10 and C1.20 require a 100% volumetric examination of pressure retaining welds in Class 2 vessels as defined by Figure IWC-2500-1.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of regenerative heat exchanger (RHX) welds 1 through 12.

Licensee's Proposed Alternative Examination: None. The Code-required VT-2 visual examination will be performed during the system leak tests each 40-month period.

Licensee's Basis for Requesting Relief: The Licensee reports that the general radiation level in the area of the RHX is between 500 mRem/hr and 2 Rem/hr. These readings are based on a September 4, 1989 survey. The manrem estimate to prepare, inspect, and reinstate these welds is projected by the Licensee to be 84 Rem.

The Licensee also reports that remote examination in this situation is not practical because of the configuration of the component (nozzles, supports, and welded attachment interferences) and that shielding is not practical since the source of radiation is the component to be examined.

The Licensee further states that the required examinations are restricted because of component geometry limitations. Weld crowns, nozzles, endcap curvature, welded attachments and vessel support structure all contribute to limiting weld volumetric examinations to varying degrees.

There are two mechanisms available to detect leakage:

(a) The control room operators perform Operating Surveillance Test (OST) 1.6.2, "Reactor Coolant System Water Inventory Balance," every three days when the plant is operating at steady state conditions. Leakage through the subject welds would be detected by this OST.

(b) The inventory in the liquid waste system is logged daily (log L3-11). Since leakage from these welds would be collected by the liquid waste system, a through-wall leak would be apparent in this inventory. The inventory is reviewed daily. Radiation monitors within the liquid waste system would also detect any leakage from these welds.

The RHX is readily isolable should a leak occur. The RHX has double-valve isolation from the primary system and is automatically isolated on a pressurizer low level signal. It could be easily isolated by the control room operators should one of the welds be discovered to be leaking.

Evaluation: We concur that the general radiation level in the area of the RHX is significantly high and poses ALARA concerns. However, the Licensee's manrem estimate to prepare, inspect, and reinstate these welds (84 Rem), as supplied in the Table attached to the relief request, appears to the reviewer to be somewhat inflated.

As the Licensee has stated, remote examination in this situation is not practical because of the configuration of the components, and shielding is not practical since the source of radiation is the component being examined.

Previous ultrasonic examinations performed on these welds during the first ten year interval detected no recordable indications.

Based on the ALARA considerations and the limitations to examination as described above, the Code-required volumetric examination of the subject RHX welds is impractical to perform. Because these welds are subject to routine monitoring during plant operation, weld degradation sufficient to cause a through-wall leak would be detected in a timely manner, and because the RHX is readily isolable should a leak occur, reasonable assurance of continuing plant safety is maintained.

Conclusions: It is concluded that the volumetric examination required by Section XI of the ASME Code for the subject regenerative heat exchanger welds is impractical to perform at Beaver Valley, Unit 1. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirements were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.2 Piping

3.2.2.1 Relief Request BV1-C5.11-1 (Rev. 2), Examination Category C-F-1, Pressure Retaining Class 2 Piping Circumferential Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-F-1, Item C5.11 requires both 100% volumetric and surface examinations of Class 2 pressure retaining circumferential piping welds as defined by Figure IWC-2500-7.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume (CRV) of the following three Class 2 circumferential piping welds:

Weld Number	CRV Examinable
SI-TK-2-E-01	63%
SI-TK-2-E-02	63%
SI-18-1-S-05	67%

Licensee's Proposed Alternative Examination: None. As identified above, the Code-required volumetric examination will be completed to the maximum extent practical. The Code-required 100% surface examination will be completed.

Licensee's Basis for Requesting Relief: Ultrasonic examinations of welds SI-TK-2-E-01, and -02 are limited due to the nozzle-to-safe-end-to-reducer configurations and adjacent weld surface contours.

Ultrasonic examination of weld SI-18-1-S-05 is limited due to weld crown and the concentric reducer configuration.

Evaluation: The fitting and weld configurations are such that the nozzle-to-safe-end-to-reducer welds listed above cannot be fully examined. Therefore, the volumetric examination is impractical to perform to the extent required by the Code. These components would have to be redesigned in order to examine the welds in accordance with the Code requirements. Imposition of the requirement on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

The Licensee has stated that the Code-required surface examination will be performed and that the volumetric examination will be performed to the maximum extent practical.

A significant percentage (63 to 67%) of the Code-required volume can and will be examined. These examinations will provide adequate assurance that unallowable inservice flaws have not developed in the subject welds or that they will be detected and removed or repaired prior to the return of the piping to service.

Conclusions: It is concluded that the volumetric examination of the subject nozzle-to-safe-end-to-reducer welds is impractical to perform at Beaver Valley, Unit 1, to the extent required by Section XI of the ASME Code. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.2.2 Relief Request BV1-C5.12-1 (Rev. 0), Examination Category C-F-1, Pressure Retaining Class 2 Piping Longitudinal Welds

NOTE: In the April 20, 1990 response to the NRC request for additional information, the Licensee withdrew Relief Request BV1-C5.12-1 (Rev. 0).

3.2.2.3 Relief Request BV1-C5.51-1 (Rev. 0), Examination Category C-F-2, Pressure Retaining Class 2 Piping Circumferential Welds

NOTE: In the April 20, 1990 response to the NRC request for additional information, the Licensee withdrew Relief Request BV1-C5.51-1 (Rev. 0).

3.2.2.4 Relief Request BV1-C5.52-1 (Rev. 0), Examination Category C-F-2, Pressure Retaining Class 2 Piping Longitudinal Welds

NOTE: In the April 20, 1990 response to the NRC request for additional information, the Licensee withdrew Relief Request BV1-C5.52-1 (Rev. 0).

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

3.3.1 Piping

3.3.1.1 Relief Request BV1-IWF-1 (Rev. 0), Integrally Welded Class 3 Piping Supports

Code Requirement: Section XI, Table IWF-2500-1, Examination Categories F-A and F-B both require VT-3 visual examinations of piping supports as defined by Figure IWF-1300-1.

Licensee's Code Relief Request: Relief is requested from performing the Code-required VT-3 visual examination of the following five piping supports:

FC-A-21
WR-R-287C
WR-R-290C
WR-R-135
WR-R-137

Licensee's Proposed Alternative Examination: None. However, if at a later date these supports become accessible due to

plant modification or maintenance activities, the Code-required visual examination will be performed.

Licensee's Basis for Requesting Relief: The Licensee reports that VT-3 visual examinations cannot be performed on supports WR-R-287C, WR-R-290C, WR-R-135, or WR-R-137 because they are buried in concrete.

Support FC-A-21 is located underwater in the spent fuel pool and is therefore inaccessible for direct visual examination.

Evaluation: The Code-required VT-3 visual examination cannot be performed because the subject supports are either located under water or are embedded in concrete. The Section XI figures describing examination requirements do not recognize the actual as-built configuration or concrete embedment that interferes with visual examination. Therefore, the Code-required examination is impractical to perform. Extensive plant modifications would be required in order to examine these supports in accordance with the Code. Imposition of the requirement on Duquesne Light Company would cause a burden that would not be compensated significantly by an increase in safety.

Conclusions: It is concluded that the VT-3 visual examination required by Section XI of the ASME Code for the subject piping supports is impractical to perform at Beaver Valley, Unit 1. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, considering the burden upon the Licensee that could result if the requirement were imposed on the facility. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.3.2 Pumps (No relief requests)

3.3.3 Valves (No relief requests)

3.3.4 General (No relief requests)

3.4 Pressure Tests (No relief requests)

3.5 General (No relief requests)

4. CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6), it has been determined that certain Section XI required inservice examinations are impractical to perform. In all cases for which relief is requested except Relief Request BV1-B9.31-1 (Rev. 1), Relief Request BV1-B12.50-1 (Rev. 0), and the withdrawn relief requests, the Licensee has demonstrated that specific Section XI requirements are impractical. For Relief Request BV1-B9.31-1 (Rev. 1), it is concluded that the Licensee has not provided information to support the determination that the Code requirement is impractical. For Relief Request BV1-B12.50-1 (Rev. 0), pursuant to 10 CFR 50.55a(a)(3)(ii), Code compliance would result in hardship or unusual difficulty without a compensating increase in safety. In response to the NRC's request for additional information, Relief Requests BV1-B3.120-1, BV1-IWC-C-A, BV1-C1.10-1, BV1-C1.10-2, BV1-C1.10-3, BV1-C1.10-4, BV1-C1.20-1, BV1-C1.20-2, BV1-C1.20-3, BV1-C3.10-1, BV1-C5.12-1, BV1-C5.51-1, and BV1-C5.52-1 were withdrawn and deleted from the ISI Program Plan. It is concluded that relief is not required for Relief Request BV1-B1.20-1.

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 Beaver Valley Power Station, Unit 1, facility. Requiring compliance with all the exact Section XI required inspections would require redesign of a significant number of plant systems, sufficient replacement components to be obtained, installation of the new components, and a baseline examination of 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), or alternatively 10 CFR 50.55a(a)(3), relief is allowed from these requirements which are impractical to implement if granting the 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.

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

Based on the review of the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan, the Licensee's response to the NRC's requests for additional information, and the recommendations for granting relief from the ISI examination requirements that have been determined to be impractical, it is concluded that the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan, with the exception of Relief Request BV1-B9.31-1 (Rev. 1), is acceptable and in compliance with 10 CFR 50.55a(g)(4).

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:
   1974 Edition through Summer 1975 Addenda
   1983 Edition through Summer 1983 Addenda

3. Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan, Revision 1, submitted August 11, 1989.

4. NUREG-0800, Standard Review Plans, 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 March 1, 1990, P. S. Tam (NRC) to J. D. Sieber [Duquesne Light Company (DLCo)], request for additional information on the ISI Program Plan.

6. Letter, dated April 20, 1990, J. D. Sieber (DLCo) to Document Control Desk (NRC), response to NRC's March 1, 1990 request for additional information on the ISI Program Plan.

7. Letter, dated June 25, 1990, J. D. Sieber (DLCo) to Document Control Desk (NRC), containing additional response to NRC's March 1, 1990 request for additional information on the ISI Program Plan.

8. Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 7, July 1989.

9. Regulatory Guide 1.14, "Reactor Coolant Pump Flywheel Integrity," Revision 1, August 1975.

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

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This report presents the results of the evaluation of the Beaver Valley Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, Revision 1, submitted August 11, 1989, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the Licensee has determined to be impractical. The Beaver Valley Power Station, Unit 1, Second 10-Year Interval ISI Program Plan is evaluated in Section 2 of this report 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 previous Nuclear Regulatory Commission (NRC) reviews. The requests for relief are evaluated in Section 3 of this report.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

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