



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REGARDING THE
SECOND 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF NO. RR-1-TYP-2-B5.40-1, REV. 0
FOR
BEAVER VALLEY POWER STATION, UNIT NO. 1
DUQUESNE LIGHT COMPANY
OHIO EDISON COMPANY
PENNSYLVANIA POWER COMPANY
DOCKET NO. 50-334

1.0 INTRODUCTION

The Technical Specifications (TSs) for Beaver Valley Power Station, Unit No. 1 (BVPS-1), state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i).

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in the 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Beaver Valley Power Station, Unit No. 1 (BVPS-1) second 10-year inservice inspection (ISI) interval is the 1983 edition through Summer 1983 Addenda.

By letter dated March 25, 1998, the licensee proposed alternatives contained in the Request for Relief No. RR-1-TYP-2-B5.40-1, Rev. 0, for Beaver Valley Power Station, Unit No. 1.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering and Environmental Laboratory (INEEL), has evaluated the information provided by the licensee in support of the licensee's proposed alternatives contained in Request for Relief No. RR-1-TYP-2-B5.40-1, Rev. 0, for BVPS-1. Based on the results of the review, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) attached.

Request for Relief RR-1-TYP-2-B5.40-1, Rev. 0: The ASME Code, Section XI, Table IWB-2500-1, Examination Category B-F, requires a 100% volumetric and surface examination of Pressurizer Nozzle-To-Safe End Butt Welds as defined by figure IWB-2500-8.

9810230068 981019
PDR ADOCK 05000334
G PDR

ENCLOSURE

In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination of Pressurizer Nozzle-To-Safe End Welds RC-98-1E-02, RC-99-1-E-03, and RC-104-1-E-01 for impracticality. These welds received 64.55%, 84.42%, and 72.84% of the Code-required examination, respectively.

The licensee's proposed alternative to the examination requirement is to perform the complete surface examination and to perform a modified ultrasonic examination, due to the search unit lift-off caused by the nozzle-to-safe end outside diameter configuration, to the maximum extent practical using a 45 ° refracted longitudinal angle and a supplemental 60 ° refracted longitudinal angle for the volumetric examination. These angles represent the most current technology available for this examination and result in the maximum coverage allowed by the joint design and materials involved. The percentage of the examination limitation has been noted on the licensee examination reports and in the outage summary report.

Pressurizer nozzle-to-safe end welds require 100% volumetric and surface examination during each inspection interval. However, the configuration of the subject nozzle-to-safe end welds causes transducer liftoff, which limits ultrasonic examination coverage to between 64.55% and 84.42%. The Code-required 100% examination is, therefore, impractical to achieve. The licensee has supplemented the 45 ° refracted longitudinal angle scan with a 60 ° refracted longitudinal angle scan, which increased the examination coverage by at least 15%. Implementing a refracted longitudinal angle greater than 60 ° is not considered effective due to the thickness/depth of the welds. In addition, the licensee has completed the Code-required surface examination. To achieve the Code-required volumetric examination coverage, the pressurizer nozzles would have to be redesigned and modified. Imposition of this requirement would cause a significant burden on the licensee.

The licensee has performed the volumetric examination to the maximum extent practical. These examinations, in addition to the surface examination of the nozzle-to-safe end welds, provide reasonable assurance that the structural integrity will be maintained and the presence of degradation will be detected using the stated alternative. Based on the impracticality of meeting the Code coverage requirements for the subject welds, and the reasonable assurance provided by modified volumetric examination performed in conjunction with the 100% surface examination completed, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSION

The staff evaluated the licensee's submittal and concluded that complete examination coverage to the extent required by the Code is impractical for certain inservice examinations at BVPS-1. The licensee has submitted information to substantiate its position of impracticality of the Code-required volumetric examination coverage for Pressurizer Nozzle-To-Safe End Welds RC-98-1-E-02, RC-99-1-E-03, and RC-104-1-E-01. The proposed alternative provides reasonable assurance of structural integrity. Therefore, the staff concludes that Request for Relief RR-1-TYP-2-B5.40-1 is granted and the alternative imposed for the current interval pursuant to 10 CFR 50.55a(g)(6)(i). The relief granted is authorized by law and will not endanger life or 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.

Principal Contributors: D. Collins
G. Hatchett

Date: October 19, 1998

TECHNICAL LETTER REPORT
ON THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF 1-TYP-2-B5.40-1 (REV. 0)
FOR
DUQUESNE LIGHT COMPANY
BEAVER VALLEY POWER STATION, UNIT 1
DOCKET NUMBER: 50-334

1. INTRODUCTION

By letter dated March 25, 1998, the licensee, Duquesne Light Company, submitted Request for Relief 1-TYP-2-B5.40-1 (Rev. 0) seeking relief from the requirements of the ASME Code, Section XI, for the Beaver Valley Power Station, Unit 1. This relief request is for the second 10-year inservice inspection (ISI) interval. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject request for relief is in the following section.

2. EVALUATION

The information provided by Duquesne Light Company in support of the request for relief from Code requirements has been evaluated and the bases for disposition is documented below. The Code of record for the Beaver Valley Power Station, Unit 1, second 10-year ISI interval, which ended September 20, 1997, was the 1983 Edition through Summer 83 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code.

Request for Relief No. 1-TYP-2-B5.40-1 (Rev. 0), Examination Category B-F, Item B5.40, Pressurizer Nozzle-To-Safe End Welds

Code Requirement—Examination Category B-F, Item B5.40 requires a 100% volumetric and surface examination as defined by Figure IWB-2500-8.

Licensee's Code Relief Request—In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination of Pressurizer Nozzle-to-Safe End Welds RC-98-1-E-02, RC-99-1-E-03, and RC-104-1-E-01. These welds received 64.55%, 84.42%, and 72.84% of the Code-required examination, respectively.

Licensee's Basis for Requesting Relief (as stated)—

"The ultrasonic examination of these welds was limited, to the extent noted above, due to the search unit lift-off caused by the nozzle to safe end outside diameter (OD) configuration. The change in diameter between the nozzle and the safe end results in an OD configuration that inhibits coverage from both the safe end and nozzle. See attached sketches for each weld¹. A 45° refracted longitudinal angle and a supplemental 60° refracted longitudinal angle were used for the UT examinations. Use of the 60° refracted longitudinal angle increased the coverage of examination by at least 15% for each weld. A higher refracted longitudinal angle was considered for this examination but was deemed ineffective at this depth. The examination volume calculations are based on the required examination volume illustrated in ASME Section XI, Figure IWB-2500-3. The limitations preventing coverage are inherent to the design of these nozzles. There are no current NDE methods that would appreciably increase the amount of the examination coverage.

"The surface examination can be performed on 100% of the required surface."

Licensee's Proposed Alternative Examination (as stated)—

"The alternative to the examination requirement is to perform the complete surface examination and to perform the ultrasonic examination to the maximum extent practical using the supplemental scan angle noted. These angles represent the most current technology available for this examination and result in the maximum coverage allowed by the joint design and materials involved. The percentage of the examination limitation has been noted on the examination reports and in the outage summary report."

Evaluation—Pressurizer nozzle-to-safe end welds require 100% volumetric and surface examination during each inspection interval. However, the configuration of the subject nozzle-to-safe end welds causes transducer lift-off, which limits ultrasonic examination coverage to between 64.55% and 84.42%. The Code-required 100% examination is, therefore, impractical to achieve. The licensee has supplemented the 45° refracted longitudinal angle scan with a 60° refracted longitudinal angle scan, which increased the examination coverage by at least 15%. Implementing a refracted longitudinal angle greater than 60° is not considered effective due to the thickness/depth of the welds. In addition, the licensee has completed the Code-required surface examination. To achieve the Code-required volumetric examination coverage, the pressurizer nozzles would have to be redesigned and modified. Imposition of this requirement would cause a significant burden on the licensee.

The licensee has performed the volumetric examination to the maximum extent practical. These examinations, in addition to the surface examination of the nozzle-to-safe end

¹ Sketches included in the licensee's submittal are not included in this report.

welds, provide reasonable assurance that any existing patterns of degradation would have been detected, if present. Therefore, based on the impracticality of the Code examination coverage requirements and the examinations performed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3. CONCLUSION

The INEEL staff evaluated the licensee's submittal and concluded that certain inservice examinations cannot be performed to the extent required by the Code at the Beaver Valley Power Station, Unit 1. The licensee has provided information to support the determination that the Code-required volumetric examination coverage for Pressurizer Nozzle-to-Safe End Welds RC-98-1-E-02, RC-99-1-E-03, and RC-104-1-E-01 is impractical. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).