September 6, 2000

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: QUAD CITIES, UNITS 1 AND 2 - RELIEF REQUEST CR-32 FOR THIRD 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NOS. MA7164 AND MA7165)

Dear Mr. Kingsley:

By letter dated October 29, 1999, Commonwealth Edison Company (ComEd) submitted a request for relief, CR-32, from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, for Quad Cities Nuclear Power Station, Units 1 and 2. The staff, with assistance from its contractor, the Idaho National Engineering and Environmental Laboratory (INEEL), has reviewed and evaluated the information provided by ComEd related to CR-32. The NRC staff adopts the evaluations and conclusions contained in the Technical Letter Report prepared by INEEL, as discussed in the enclosed Safety Evaluation.

Relief Request CR-32 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year inservice inspection interval, with the exception of the welds discussed below, because it would be impractical for ComEd to comply with the regulations and because the proposed alternatives provide reasonable assurance of structural integrity. Relief is denied for reactor pressure vessel base metal repair weld BMR-067-295 (Unit 1) because the request did not provide sufficient information to permit a staff review. Relief is denied for reactor pressure vessel nozzle-to-vessel welds N3A IRS (Unit 1), N1A IRS (Unit 1), N3A IRS (Unit 2) and N1A IRS (Unit 2) because ComEd intends to examine these welds later in the inspection interval.

If you have any questions about this review, please contact Stewart Bailey at (301) 415-1321.

Sincerely,

/RA/
Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-254 and 50-265

Enclosure: Safety Evaluation w/atts

cc w/encl: See next page

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*concur by memo; no major revisions **see previous page for concurrence

ACCESSION NO.: ML003747958

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUEST FOR RELIEF CR-32

FOR THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

COMMONWEALTH EDISON COMPANY

AND MIDAMERICAN ENERGY COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NUMBERS 50-254 AND 50-265

1.0 INTRODUCTION

Inservice Inspection (ISI) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME 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). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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 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 Code of record for the Quad Cities Nuclear Power Station, Units 1 and 2, third 10-year ISI interval is the 1989 Edition of the ASME Code.

By letter dated October 29, 1999, Commonwealth Edison Company (ComEd, or the licensee) requested approval of relief request CR-32, relating to volumetric and surface examination

coverage, for the third 10-year ISI interval for Quad Cities. The staff has reviewed and evaluated the licensee's request and their supporting information described below.

2.0 EVALUATION

The staff, with technical assistance from Idaho National Engineering and Environmental Laboratory (INEEL), has reviewed the information concerning Request for Relief CR-32. The review is divided into eight parts (A through H) according to the Code requirements and the unit. The staff adopts the evaluations and recommendations for granting or denying relief contained in the Technical Letter Report (TLR) prepared by INEEL, except the staff notes that the TLR incorrectly designates welds BMR-018-310 and BMR-067-295 as BRM-167-310 and BMR-167-295, respectively. Attachment 1 lists each weld covered by the relief request and the status of approval. The TLR is Attachment 2.

For Quad Cities, relief is granted from the inspection requirements which have been determined to be impractical to perform. Furthermore, the licensee's Request for Relief CR-32 provides reasonable assurance of structural integrity of the subject components. Relief is denied for reactor pressure vessel nozzle-to-vessel welds N3A IRS (Unit 1), N1A IRS (Unit 1), N3A IRS (Unit 2) and N1A IRS (Unit 2) because the licensee intends to examine these welds later in the interval and it is not appropriate for the staff to grant relief at this time. Relief is denied for reactor pressure vessel base metal repair weld BMR-067-295 (Unit 1) because the request did not provide sufficient information to permit an evaluation.

3.0 CONCLUSION

The request for relief, CR-32, from Code requirements for the Quad Cities ISI program has been reviewed by the staff with the assistance of its contractor, INEEL. INEEL's evaluation is contained in the TLR (Attachment 2). The staff has reviewed the TLR and adopts INEEL's evaluations and recommendations for granting relief and for denying relief. Attachment 1 provides a summary of the staff's evaluation for each weld covered by CR-32.

The staff concludes that Request for Relief CR-32, with the exceptions noted above, provides reasonable assurance of structural integrity of the subject components. The staff has determined that the inspection requirements are impractical and granting relief pursuant to 10 CFR 50.55a(g)(6)(i) 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. Request for Relief CR-32 is granted, with the exceptions noted above, for the third 10-year interval inservice inspection program plan.

Attachments: 1. Summary of Relief Requests
2. Technical Letter Report

Principal Contributor: T. McLellan

Date: September 6, 2000

SUMMARY OF RELIEF REQUESTS

Relief Request Number	INEEL TLR Sec.	System or Component	Exam Cat.	Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Disposition
CR-32, Part A	2.1	RPV	B-A	B1.51	Repair Welds: RPV BMR-167-305 RPV BMR-018-310 RPV BMR-067-295	Volumetric	Volumetric to extent practical	Granted (in part) pursuant to 10 CFR 50.55a(g)(6)(i). Denied for Weld RPV BMR-167-295
CR-32, Part B	2.2	RPV	B-D	B3.90 B3.100	Nozzle-to-vessel Welds: RPV N1A NOZ, RPV N2A NOZ RPV N2B NOZ, RPV N2C NOZ RPV N2D NOZ, RPV N2E NOZ RPV N3A NOZ, RPV N3B NOZ RPV N4A NOZ, RPV N4B NOZ RPV N4C NOZ, RPV N4D NOZ RPV N5A NOZ, RPV N6A NOZ RPV N7 NOZ, RPV N8A NOZ Nozzle IR Sections: RPV N1A IRS, RPV N2A IRS RPV N2B IRS, RPV N2C IRS RPV N2D IRS, RPV N2E IRS RPV N3A IRS, RPV N3B IRS RPV N5A IRS, RPV N6A IRS RPV N7 IRS, RPV N8A IRS	Volumetric	Volumetric to extent practical	Granted (in part) pursuant to 10 CFR 50.55a(g)(6)(i). Relief not granted for Nozzles RPV N3A IRS and RPV N1A IRS
CR-32, Part C	2.3	Class 1	B-F B-J	B5.130 B9.11	Dissimilar Metal Weld: CSB 14B-F16 Circumferential Piping Welds: CSB 14B-F16 JPI N8A-S3 RR 02-F1 RR 02H-F6 RR 02BS-F6 RHRA 10AD-F1 RHRB 10BD-F1 RWCU 12S-F24R	Volumetric	Volumetric to extent practical	Granted pursuant to 10 CFR 50.55a(g)(6)(i).
CR-32, Part D	2.4	Class 2	C-C	C3.20	Integral Attachment Welds: CRD 0318A-W-201A RHRB 1009B-W-211A	Surface	Surface to extent practical	Granted pursuant to 10 CFR 50.55a(g)(6)(i).
CR-32, Part E	2.5	Class 2	C-F-2	C5.51 C5.81	Circ. Piping Weld FWB 3204B-5 Circ. Branch Connection Weld RHRB 1016D-8	Volumetric and/or surface	Code-required exams to extent practical	Granted pursuant to 10 CFR 50.55a(g)(6)(i).
CR-32, Part F	2.6	RPV	B-D	B3.90 B3.100	Nozzle-to-vessel Welds: RPV N1A NOZ, RPV N2A NOZ RPV N2B NOZ, RPV N2C NOZ RPV N2D NOZ, RPV N2E NOZ RPV N3A NOZ, RPV N4A NOZ, RPV N4B NOZ RPV N4C NOZ, RPV N4D NOZ RPV N5A NOZ, RPV N6A NOZ RPV N7 NOZ, RPV N8A NOZ Nozzle IR Sections: RPV N1A IRS, RPV N2A IRS RPV N2B IRS, RPV N2C IRS RPV N2D IRS, RPV N2E IRS RPV N3A IRS, RPV N5A IRS	Volumetric	Volumetric to extent practical	Granted (in part) pursuant to 10 CFR 50.55a(g)(6)(i). Relief not granted for Nozzles RPV N3A IRS and RPV N1A IRS
CR-32, Part G	2.7	Class 1	B-F B-J	B5.130 B9.11	Dissimilar Metal Weld: CSA 14B-S8R Circumferential Piping Welds: RR 02-F1, RHRA 10AD-F3 RHRB 10BD-F1, RWCU 12S-F12R RWCU 12S-S29R	Volumetric	Volumetric to extent practical	Granted pursuant to 10 CFR 50.55a(g)(6)(i).
CR-32, Part H	2.8	Class 2	C-C	C3.20	Integral Attachment Welds: CRD 0318A-W-201A	Surface	Surface to extent practical	Granted pursuant to 10 CFR 50.55a(g)(6)(i).

ATTACHMENT 1

TECHNICAL LETTER REPORT
ON THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF CR-32
FOR
COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
DOCKET NUMBERS: 50-254 AND 50-265

1. INTRODUCTION

By letter dated October 29, 1999, the licensee, Commonwealth Edison Company, submitted Request for Relief No. CR-32 from the requirements of the ASME Code, Section XI, for the Quad Cities Nuclear Power Station, Units 1 and 2 third 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 Commonwealth Edison Company in support of the request for relief from Code requirements has been evaluated and the basis for disposition is documented below. The Code of record for the Quad Cities Nuclear Power Station, Units 1 and 2, third 10-year ISI interval, which end February 2003 and March 2003, respectively, is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

2.1 Request for Relief No. CR-32 (Unit 1), Part A, Examination Category B-A, Item B1.51 Reactor Pressure Vessel (RPV) Repair Welds

Code Requirement: Examination Category B-A, Item B1.51 requires 100% volumetric examination, as defined by Figures IWB-2500-1 and -2, for repair welds in the RPV beltline region.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code coverage requirements for the RPV beltline weld repairs listed below.

Table CR-32.1, Part A			
Cat/ Item	Component ID	Limitation	Coverage
B-A/ B.51	RPV BMR-167-305	Jet pump riser braces and guide rod	79.5% UT
	RPV BMR-018-310	Jet pump riser braces and guide rod	62.6% UT
	RPV BMR-067-295	Jet pump riser braces and guide rod	0% UT

Licensee's Basis for Requesting Relief (as stated):
"In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that the required "essentially 100%" coverage examination is impractical due to physical obstructions and limitations imposed by design, geometry and materials of construction for the components of TABLE CR-32.1 [paraphrased above] and TABLE CR-32.2 [Unit 2]

"Quad Cities Nuclear Power Station, Units 1 and 2, obtained Construction Permits CPPR-23 and CPPR-24, respectively, on February 15, 1967. The piping systems and associated components were designed and fabricated before the examination requirements of ASME Section XI were formalized and published. Since this plant was not specifically designed to meet the requirements of ASME Section XI, compliance is not feasible or practical within the limits of the current plant design.

"Physical obstructions imposed by design, geometry and materials of construction are typical of vessel appurtenances and sacrificial shield, insulation support rings, structural and component support members, adjacent component weldments in close proximity, unique component configurations and dissimilar metal weldments. Typical drawings or sketches are depicted in FIGURE CR-32.1 through FIGURE CR-32.5 [contained in the licensee's submittal].

"Improved examination techniques have been progressively upgraded during this interval to augment the required Section XI examinations. We have used the Electric Power Research Institute (EPRI), the Performance Demonstration Initiative (PDI), Inservice Inspection (ISI) vendors and other industry sources to encourage the development of and provide an awareness of improved examination techniques to enhance coverage and flaw detection commensurate with radiation dose reduction.

"ComEd examination procedures are revised on a continuing basis to incorporate proven techniques for a higher level of safety and quality as they become available. The examinations and techniques used today exceed the examinations conducted in the past on each component.

"All components received as a minimum, the required examination(s) applicable to the extent practical due to the limited or lack of access available. The examinations conducted, confirmed satisfactory results evidencing no unacceptable flaws present, even though "essentially 100%" coverage was not attained. ComEd has concluded that if any active degradation mechanisms were to exist in the subject welds, those degradations would have been identified in the examinations performed.

"Based on the above, with our earlier design, the underlying objectives of the Code required volumetric and surface examinations have been met. The examinations were completed to the extent practical and evidenced no unacceptable flaws present. Additionally, a VT-2 examination performed on the

subject components during system pressure test per examination category B-P each refueling outage and category C-H each period provides additional assurance that the structural integrity of the subject components is maintained."

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

Evaluation: The Code requires 100% volumetric examination of the subject repair welds. However, complete examination of these areas is limited by jet pump riser braces and guide rods. As supported by figures attached to the licensee's submittal, these restrictions limit access and make the Code coverage requirements impractical for the subject weld repairs. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined a significant portion (79.5% and 62.6%) of two of the three welds. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i) for Welds RPV BMR-167-305 and RPV BMR-167-310. For Weld RPV BMR-167-295, which received no examination coverage, the licensee has not adequately justified the limitations or provided an acceptable alternative to the Code examination requirements. Therefore, it is recommended that relief be denied for Weld RPV BMR-167-295.

2.2 Request for Relief No. CR-32 (Unit 1), Part B, Examination Category B-D, Items B3.90 and B3.100, Reactor Pressure Vessel (RPV) Nozzle-to-Vessel Welds and Inside Radius (IR) Sections

Code Requirement: Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination, as defined by Figure IWB-2500-7, for RPV nozzle-to-vessel welds and IR sections.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code coverage requirements for the welds and examination areas listed in Table CR 32.1, Part B below.

Table CR-32.1, Part B				
Cat/ Item	Component ID	Description	Limitation	Coverage
B-D B3.90	RPV N1A NOZ	Recirculation	Nozzle, radius blend and weld configuration	20.7% UT
	RPV N2A NOZ			24.78% UT
	RPV N2B NOZ			24.78% UT

Table CR-32.1, Part B				
Cat/ Item	Component ID	Description	Limitation	Coverage
	RPV N2C NOZ			40.26% UT
	RPV N2D NOZ			40.26% UT
	RPV N2E NOZ			40.26% UT
B-D B3.90 (con't)	RPV N3A NOZ	Main Steam	Nozzle, radius blend and weld configuration	21.43% UT
	RPV N3B NOZ			46.65% UT
	RPV N4A NOZ	Feed water	Nozzle, radius blend and weld configuration	26.71% UT
	RPV N4B NOZ			26.71% UT
	RPV N4C NOZ			26.71% UT
	RPV N4D NOZ			26.71% UT
	RPV N5A NOZ	Core Spray	Nozzle, radius blend and weld configuration	24.35% UT
	RPV N6A NOZ	Head Spray		43.07% UT
	RPV N7 NOZ	Head Vent		38.96% UT
	RPV N8A NOZ	Jet Pump Instrument	Nozzle, radius blend, weld config. and lower head weld	41.53% UT
B-D B3.100	RPV N1A IRS	Recirculation	Vessel, weld, radius blend and nozzle config.	0% UT
	RPV N2A IRS		Nozzle, radius blend and weld configuration	65.53% UT
	RPV N2B IRS			65.53% UT
	RPV N2C IRS			77.63% UT
	RPV N2D IRS			77.63% UT
	RPV N2E IRS			77.63% UT
	RPV N3A IRS	Main Steam	Vessel, weld, radius blend and nozzle config	0% UT
	RPV N3B IRS		Nozzle, radius blend and weld configuration	70.65% UT
	RPV N5A IRS	Core Spray	Nozzle, radius blend and weld configuration	63.91% UT
	RPV N6A IRS	Head Spray		82.69% UT
	RPV N7 IRS	Head Vent		72.81% UT

Table CR-32.1, Part B				
Cat/ Item	Component ID	Description	Limitation	Coverage
	RPV N8A IRS	Jet Pump Instrument	Nozzle, radius blend, weld config. and lower head weld	69.78% UT

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

"Units 1 and 2, System Reactor Pressure Vessel (RPV), Components (N1A IRS) and (N3A IRS) each received 0% coverage from the ultrasonic examination conducted during the first period of this interval, due to procedure inadequacies identified during our review for this relief request. Both components of both units will be reexamined as Proposed Alternate Examinations with updated procedures and techniques. The N3A IRS component will be examined during Q2R15 in January of 2000. The remaining components will be examined during the 3rd period of the current interval."

Evaluation: The Code requires 100% volumetric examination of the subject nozzle-to-vessel welds and nozzle IR sections. However, complete examination of these areas is limited by nozzle and vessel configuration (i.e. nozzle bore size and vessel wall thickness). These restrictions limit access and make the Code coverage requirements impractical for the subject examination areas. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined each nozzle-to-vessel weld and IR section to the extent practical with coverages as high as 70-80% for a number of the examination areas. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i) except for the IR sections of main steam nozzle N3A IRS and recirculation Nozzle N1A IRS which were not examined. Since the license plans to examine those later in the interval, relief should not be granted for those two nozzles at this time.

2.3 Request for Relief No. CR-32 (Unit 1), Part C, Examination Category B-F and B-J, Items B5.130 and B9.11, Dissimilar Metal Welds and Piping Welds

Code Requirement: Examination Category B-F, Item B5.130 requires 100% volumetric and surface examination, as defined by Figure IWB-2500-8, for dissimilar metal welds 4-inch NPS or larger. Examination Category B-J, Item B9.11 requires 100% surface and volumetric examination of circumferential welds in pressure-retaining piping NPS 4 or larger, as defined by Figure IWB-2500-8, -9, -10, and -11 each inspection interval.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code coverage requirements for the welds listed below.

Table CR-32.1, Part C				
Cat/ Item	Component ID	Description	Limitation	Coverage
B-F/ B5.130	CSB 14B-F16	CS Pipe to SS valve	Valve & weld config. and unique weld design	UT 66.05%
B-J/ B9.11	CSB 14B-F16	Penetration pipe	Penetration config.	UT 70.19%
	JPI N8A-S3	Reducer-Reducer	Component/weld config.	UT 75%
	RR 02-F1	Valve-Pipe	Valve config.	UT 69.53%
	RR 02H-F6	Pipe-Sweepolet	Sweepolet config.	UT 66.39%
	RR 02BS-F6	Tee-Valve	Component/weld config.	UT 70.72%
	RHRA 10AD-F1	Pipe-Tee	Component/weld config.	UT 66.48%
	RHRB 10BD-F1	Pipe-Tee	Component/weld config.	UT 70.32%
	RWCU 12S-F24R	Penetration pipe	Penetration config.	UT 83.24%

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

Evaluation: The Code requires 100% surface and volumetric examination for the subject piping welds and dissimilar metal weld. However, complete volumetric examination of these welds was limited by weld and/or component configuration. As supported by the licensee's figures and written description, these restrictions limit access and make the Code coverage requirements impractical for the subject welds. To meet the Code coverage requirements, design modifications would be necessary to

provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined a significant portion (>66%) of each of the subject welds along with complete surface examination. In addition, these welds are part of a larger population of similar welds that are being examined to the extent required by the Code. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.4 Request for Relief No. CR-32 (Unit 1), Part D, Examination Category C-C, Item C3.20, Integrally Welded Attachments to Piping

Code Requirement: Examination Category C-C, Item C3.20 requires 100% surface examination, as defined by Figure IWC-2500-5, for integrally welded attachments to piping.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required surface examination of the following integral attachment welds:

Table CR-32.1, Part D				
Cat/ Item	Component ID	Description	Limitation	Coverage
C-C C3.20	CRD 0318A-W-201A	Guide w/8 lugs welded to pipe	Welded support bracket & branch connection	MT 87.98%
C-C C3.20	RHRB 1009B-W-211A	Guide w/8 lugs welded to pipe	Welded support bracket & structural embed	MT 46.14%

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

Evaluation: The Code requires 100% surface examination for the subject integrally welded attachments. However, complete surface examination was limited by physical obstructions which restrict access and make the Code coverage requirements impractical for the subject welds. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined a significant portion (88% and 46%) of each of the integral attachment welds. In addition, these welds are part of a larger population of similar attachment welds that are being examined to the extent required by the Code. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.5 Request for Relief No. CR-32 (Unit 1), Part E, Examination Category C-F-2, Items C5.51 and C5.81, Circumferential Piping Welds and Circumferential Branch Connection Welds in Branch Piping

Code Requirement: Examination Category C-F-2, Item C5.51 requires 100% surface and volumetric examination, as defined by Figure IWC-2500-7 for circumferential piping welds ≥3/8-inch thick in piping > NPS 4. Item C5.81 requires 100% surface examination, as defined by Figures IWC-2500-9 to -13, inclusive, for circumferential branch connection welds in branch piping ≥ NPS 2.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required volumetric examinations of the following branch connection welds:

Table CR-32.1, Part E				
Cat/ Item	Component ID	Description	Limitation	Coverage
C-F-2 C5.51	FWB 3204B-5	Pipe-Valve	Valve config. & adjacent saddle weld	UT 86.84%
C-F-2 C5.81	RHRB 1016D-8	Pipe-Branch	Adjacent flanges	MT 86.7%

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

Evaluation: The Code requires 100% volumetric and/or surface examination of the subject branch connection welds. However, complete examination of these welds is limited by component configuration and/or adjacent obstructions. Therefore, the Code coverage requirements are impractical for these welds. To complete the examinations to the extent required by the Code, design modifications would be necessary. Imposition of the Code coverage requirements would result in considerable burden on the licensee.

The licensee has completed a significant portion (>86%) of the Code-required examinations. In addition, these welds are part of a larger sample of welds that are being examined to the extent of the Code. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Based on the impracticality of meeting the Code coverage requirements and the reasonable assurance provided by the examinations that were completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.6 Request for Relief No. CR-32 (Unit 2), Part F, Examination Category B-D, Items B3.90 and B3.100, Reactor Pressure Vessel (RPV) Nozzle-to-Vessel Welds and Inside Radius (IR) Sections

Code Requirement: Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination, as defined by Figure IWB-2500-7, for RPV nozzle-to-vessel welds and IR sections.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code coverage requirements for the welds and examination areas listed below.

Table CR-32.2, Part F				
Cat/ Item	Component ID	Nozzle Description	Limitation	Coverage
B-D B3.90	RPV N1A NOZ	Recirculation	Nozzle, radius blend and weld configuration	20.44% UT
	RPV N2A NOZ			25.95% UT
	RPV N2B NOZ			26.36% UT
	RPV N2C NOZ			25.95% UT
	RPV N2D NOZ			25.95% UT
	RPV N2E NOZ			26.36% UT
	RPV N3A NOZ	Main Steam	Nozzle, radius blend and weld configuration and adjacent flange	21.55% UT
	RPV N4A NOZ	Feed water	Nozzle, radius blend and weld configuration	45.3% UT
	RPV N4B NOZ			45.3% UT
	RPV N4C NOZ			45.3% UT
	RPV N4D NOZ			45.3% UT
	RPV N5A NOZ	Core Spray	Nozzle, radius blend weld configuration & insulation ring	23.74% UT

Table CR-32.2, Part F				
Cat/ Item	Component ID	Nozzle Description	Limitation	Coverage
	RPV N6A NOZ	Head Spray	Nozzle, radius blend and weld configuration	28.61% UT
	RPV N7 NOZ	Head Vent		38.95% UT
	RPV N8A NOZ	Jet Pump Instrument	Nozzle, radius blend, weld config. and lower head weld	57.67% UT
B-D B3.100	RPV N1A IRS	Recirculation	Vessel, weld, radius blend and nozzle config.	0% UT
	RPV N2A IRS		Nozzle, radius blend and weld configuration	61.23% UT
	RPV N2B IRS			71.69% UT
	RPV N2C IRS			61.23% UT
	RPV N2D IRS			71.69% UT
	RPV N2E IRS			77.63% UT
	RPV N3A IRS	Main Steam	Vessel, weld, radius blend nozzle config & adjacent weld	0% UT
	RPV N5A IRS	Core Spray	Nozzle, radius blend and weld configuration	63.9% UT
B-D B3.100 (con't)	RPV N6A IRS	Head Spray		87.8% UT
	RPV N7 IRS	Head Vent		75.26% UT
	RPV N8A IRS	Jet Pump Instrument	Nozzle, radius blend, weld config. and lower head weld	68.66% UT

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

"Units 1 and 2, System Reactor Pressure Vessel (RPV), Components (N1A IRS) and (N3A IRS) each received 0% coverage from the ultrasonic examination conducted during the first period of this interval, due to procedure inadequacies identified during our review for this relief request. Both components of both units will be reexamined as Proposed Alternate Examinations with updated procedures and techniques. The N3A IRS component will be examined during Q2R15 in January of 2000. The remaining components will be examined during the 3rd period of the current interval."

Evaluation: The Code requires 100% volumetric examination of the subject nozzle-to-vessel welds and nozzle IR sections. However, complete examination of these areas is limited by nozzle and vessel configuration (i.e. nozzle bore size and vessel wall thickness). These restrictions limit access and make the Code coverage requirements impractical for the subject examination areas. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined each nozzle-to-vessel weld and IR section to the extent practical with coverages as high as 70-80% for a number of the examination areas. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i) except for the IR sections of main steam nozzle N3A IRS and recirculation Nozzle N1A IRS which were not examined. Since the licensee plans to examine those later in the interval, relief should not be granted for those two nozzles at this time.

2.7 Request for Relief No. CR-32 (Unit 2), Part G, Examination Category B-F and B-J, Items B5.130 and B9.11, Dissimilar Metal Welds and Piping Welds

Code Requirement: Examination Category B-F, Item B5.130 requires 100% volumetric and surface examination, as defined by Figure IWB-2500-8, for dissimilar metal welds 4-inch NPS or larger. Examination Category B-J, Item B9.11 requires 100% surface and volumetric examination of circumferential welds in pressure-retaining piping NPS 4 or larger, as defined by Figure IWB-2500-8, -9, -10, and -11 each inspection interval.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code coverage requirements for the welds listed below.

Table CR-32.2, Part G				
Cat/ Item	Component ID	Description	Limitation	Coverage
B-F/ B5.130	CSA 14B-S8R	SS valve to CS Pipe	Valve & weld config. and unique weld design	UT 68.08%
B-J/ B9.11	RR 02-F1	Valve-Pipe	Valve config.	UT 83%
	RHRA 10AD-F3	Elbow-Valve	Valve config. & welded attachment	UT 87.4%
	RHRB 10BD-F1	Tee-Pipe	Tee config.	UT 78.1%
	RWCU 12S-F12R	Valve-Pipe	Valve/weld config.	UT 87.48%
	RWCU 12S-S29R	Pipe-Valve	Valve/weld config.	UT 35.21%

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

Evaluation: The Code requires 100% surface and volumetric examination for the subject piping welds and dissimilar metal weld. However, complete volumetric examination of these was limited by weld and/or component configuration. As supported by the licensee's figures and written description, these restrictions limit access and make the Code coverage requirements impractical for the subject welds. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined a significant portion (35-87%) of each of the subject welds along with complete surface examination. In addition, these welds are part of a larger population of similar welds that are being examined to the extent required by the Code. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.8 Request for Relief No. CR-32 (Unit 2), Part H, Examination Category C-C, Item C3.20, Integrally Welded Attachments to Piping

Code Requirement: Examination Category C-C, Item C3.20 requires 100% surface examination, as defined by Figure IWC-2500-5, for integrally welded attachments to piping.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required surface examination of the following integral attachment welds:

Table CR-32.1, Part H				
Cat/ Item	Component ID	Description	Limitation	Coverage
C-C C3.20	CRD 0318A-W-201A	Guide w/8 lugs welded to pipe	Welded support bracket & branch connection	MT 89.18%

Licensee's Basis for Requesting Relief:
As stated in Section 2.1 of this report.

Licensee's Proposed Alternative Examination (as stated):
"Quad Cities Nuclear Power Station Units 1 and 2 will revisit the subject components in TABLE CR-32.1 and TABLE CR-32.2 during the Fourth Inservice Inspection Interval with plans for increased coverage."

Evaluation: The Code requires 100% surface examination for the subject integrally welded attachment. However, complete surface examination was restricted by physical obstructions which limited access and made the Code coverage requirements impractical for the subject attachment. To meet the Code coverage requirements, design modifications would be necessary to provide access for examination. Imposition of the Code requirements would result in an undue hardship on the licensee.

The licensee has examined a significant portion (89%) of the integral attachment weld. In addition, this attachment is part of a larger population of similar attachments that are being examined to the extent required by the Code. As a result, any existing patterns of degradation would have been detected and reasonable assurance of the continued structural integrity has been provided. Therefore, 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 Quad Cities Nuclear Power Station, Units 1 and 2. For Request for Relief CR-32, Parts A-H, it is concluded that the Code requirements are impractical to meet in most cases, and relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i) with the exceptions noted below.

For repair Weld RPV BMR-067-295, which received no examination coverage, it is concluded that the licensee has not adequately justified the limitations or provided an acceptable alternative to the Code examination requirements. Therefore, it is recommended that relief be denied.

Further, examinations of IR sections for main steam nozzles RPV NA3 IRS (Unit 1 and 2) and recirculation nozzles NA1 IRS (Unit 1 and 2) have not yet been performed and are scheduled for the end of the current interval. Therefore, relief should not be granted at this time. Any limitations should be documented and resubmitted after the examinations are completed.