

TECHNICAL EVALUATION REPORT
QUAD CITIES NUCLEAR POWER STATION
UNITS 1 AND 2
INSERVICE INSPECTION PROGRAM

Submitted to:

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TECHNICAL EVALUATION REPORT
QUAD CITIES NUCLEAR POWER STATION UNITS 1 AND 2
INSERVICE INSPECTION PROGRAM

INTRODUCTION

The revision to 10 CFR 50.55a, published in February 1976, required that Inservice Inspection (ISI) Programs be updated to meet the requirements (to the extent practical) of the Edition and Addenda of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code* incorporated in the Regulation by reference in paragraph (b). This updating of the programs was required to be done every 40 months to reflect the new requirements of the later edition of Section XI.

As specified in the February 1976 revision, for plants with Operating Licenses issued prior to March 1, 1976, the regulations became effective after September 1, 1976, at the start of the next regular 40-month inspection period. The initial inservice examinations conducted during the first 40-month period were to comply with the requirements in editions of Section XI and addenda in effect no more than six months prior to the date of start of facility commercial operation.

The Regulation recognized that the requirements of the later editions and addenda of the Section XI might not be practical to implement at facilities because of limitations of design, geometry, and materials of construction of components and systems. It therefore permitted determinations of impractical examination or testing requirements to be evaluated. Relief from these requirements could be granted provided health and safety of the public were not endangered giving due consideration to the burden placed on the licensee if the requirements were imposed. This report provides evaluations of the various requests for relief by the licensee, Commonwealth Edison Company (CE), of the Quad Cities Nuclear Power Station, Units 1 and 2. It deals only with inservice examinations of components and with system pressure tests. Inservice tests of pumps and valves (IST programs) are being evaluated separately.

* Hereinafter referred to as Section XI or Code.



The revision to 10 CFR 50.55a, effective November 1, 1979, modified the time interval for updating ISI programs and incorporated by reference a later edition and addenda of Section XI. The updating intervals were extended from 40 months to 120 months to be consistent with intervals as defined in Section XI.

For plants with Operating Licenses issued prior to March 1, 1976, the provisions of the November 1, 1979, revision are effective after September 1, 1976, at the start of the next one-third of the 120-month interval. During the one-third of an interval and throughout the remainder of the interval, inservice examinations shall comply with the latest edition and addenda of Section XI, incorporated by reference in the Regulation, on the date 12 months prior to the start of that one-third of an interval. For Quad Cities Nuclear Power Station Units 1 and 2, the ISI program and the relief requests evaluated in this report cover the last 40 months of the current 120-month inspection interval, i.e., from October 18, 1979, and November 10, 1979, to February 18, 1983, and March 10, 1983,* respectively. The applicable version of Section XI is the 1974 Edition with Addenda through the Summer of 1975.

The November 1979 revision of the Regulation also provides that ISI programs may meet the requirements of subsequent code editions and addenda, incorporated by reference in paragraph (b) and subject to Commission approval. Portions of such editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. These instances are addressed on a case-by-case basis in the body of this report.

Finally, Section XI of the code provides for certain components and systems to be exempted from its requirements. In some instances, these exemptions are not acceptable to NRC or are only acceptable with restrictions. As appropriate, these instances are also discussed in this report.

References (1) to (7) listed at the end of this report pertain to previous transmittals on ISI between the licensee and the Commission. By letters of April 28 and November 24, 1976,^(1,3) the Commission provided general ISI guidance to all licensees. On September 10, 1976,⁽²⁾ the licensee responded to the guidance and submitted a proposal to amend Appendix A of the Technical

*We plan to verify these interval dates by obtaining a reference letter mentioned in licensee's response to the RAI.



Specifications. On April 18, 1979,⁽⁴⁾ the licensee submitted an additional amendment to its Technical Specifications regarding ISI, and on July 25, 1979,⁽⁵⁾ submitted its Inservice Inspection Program for Units 1 and 2. By letter of April 15, 1982,⁽⁶⁾ the Commission requested additional information to complete the review of the ISI program. This information was furnished by the licensee on June 15, 1982.⁽⁷⁾

From these submittals, a total of 15 requests (a) for relief from Code requirements, (b) for updating to a later code, and (c) for exemptions not necessarily acceptable to the Commission were identified. These exemptions are evaluated in the following sections of this report. In addition, one request for code exemption based on chemistry control was withdrawn by the licensee in Reference 7.

I. CLASS 1 COMPONENTS

A. Reactor Vessel

1. Relief Requests CR-1 and CR-2, Pressure Retaining Welds, Categories B-A and B-B, Items B1.1 and B1.2

Code Requirement

Category B-A (In Reactor Vessel Beltline Region):

Volumetric examination of the shell longitudinal and circumferential welds shall be performed and shall cover at least 10% of the length of each longitudinal weld, and 5% of the length of each circumferential weld, with the minimum length of weld examined equal to one wall thickness. The examination may be performed at or near the end of each inspection interval.

Category B-B (In Vessels):

Volumetric examinations shall be performed during each inspection interval and shall cover at least 10% of the length of each longitudinal shell weld and meridional head weld, and 5% of the length of each circumferential shell weld and head weld.

Code Relief Request

Relief is requested from the volumetric examination of the following reactor pressure vessel welds:

Category B-A Welds:

One circumferential and six longitudinal welds in the core beltline region.

Category B-B Welds:

Thirteen longitudinal welds and five circumferential welds in the shell sections and bottom head.

Proposed Alternative Examination

Currently, it is not feasible to perform the required volumetric examinations on these welds. Commonwealth Edison will, however, keep abreast of improvements in state-of-the-art NDE techniques that could provide a viable means of examination.

Licensee's Basis for Requesting Relief

Accessibility for examination of these welds was not provided for in the original plant design which occurred prior to the issuance of Section XI inservice inspection requirements.



Examination from the reactor vessel outer surface is precluded due to the close proximity to the biological shield wall and obstruction by the vessel insulation. The mirror type insulation consists of interlocking panels which were not designed to be easily removed at the weld locations. Furthermore, the annular dimensions between the shield wall and the insulation is not sufficient to allow direct access for personnel. Access through the biological shield wall is only provided at reactor vessel nozzle locations, however, there are no nozzle penetrations in the beltline region. Examination of the beltline region welds from inside the vessel is impeded by vessel internal design features. The core shroud, jet pumps, and various brackets welded to the vessel wall are not designed to be removed.

The bottom head welds cannot be examined because of the limited physical access, the inability to remove vessel insulation panels, and the interference from the forest of control rod drives and instrumentation penetrations.

Evaluation

Imposition of the Code requirements would necessitate the removal of portions of the concrete biological shield and the permanently installed insulation to perform the required examination of the welds listed from the vessel exterior. The vessel internals, shroud and jet pumps preclude volumetric examination of almost all the beltline weld volume from the vessel interior.

The reactor vessel is presently monitored for radiation damage in the beltline region by an acceptable surveillance program that conforms to 10 CFR 50, Appendix H, and a fracture toughness surveillance program that conforms to 10 CFR 50, Appendix G. In addition, the vessel was designed and fabricated in accordance with the rules of Section III of the 1965 Edition of the ASME Boiler and Pressure Vessel Code.

These examination requirements are impractical due to the existing design and geometry of the above welds. All reactor vessel closure head welds are fully accessible for examination as are the vessel and head-to-flange welds and the three longitudinal welds in the upper shell course.

To maintain the extent of examination, an alternative in-service inspection program would be required. The examination of the accessible Category B-B welds should be increased, to the extent possible, to achieve an examination sample equivalent to the Category B-A and B-B welds for which relief was requested. In addition, visual inspections of the identified welds for which code relief was requested, to the extent possible, could



be performed during system leakage and hydrostatic tests. Such examinations should furnish sufficient information to evaluate the structural reliability of the welds.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the welds discussed above, the Code requirements are impractical. It is further concluded that the alternative examinations discussed in the evaluation will provide necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from the volumetric examination of the identified welds with the following provisions:

- (a) The examinations of the accessible Category B-B welds are increased to achieve an examination sample equivalent to the Category B-A and B-B welds for which relief is requested.
- (b) Visual inspection of the accessible portions of the identified welds are conducted for evidence of leakage during system hydrostatic tests when performed as required by IWB-5000.

References

References 5, 6 and 7.



2. Relief Request CR-4, Interior Clad Surfaces of Reactor Vessels,
Category B-I-1, Items B1.13 and B1.14

Code Requirement

The examinations performed during each inspection interval shall cover 100% of the patch areas. The areas shall include at least six patches (each 36 sq. in.) evenly distributed in the closure head, and six patches (each 36 sq. in.) evenly distributed in accessible sections of vessel shell. The examination shall be (1) visual and surface or (2) volumetric for the closure head cladding, and visual for the vessel cladding.

Code Relief Request

Relief is requested from performing examinations of the closure head and vessel cladding patches.

Proposed Alternative Examination

None.

Licensee's Basis for Requesting Relief

Analysis has shown that flaws which initiate in the reactor vessel cladding, at locations other than nozzles, do not propagate through the clad-base metal interface. Therefore, their existence poses no threat to reactor vessel integrity. The nozzle areas are covered by the requirement to inspect the inner radii volumetrically to detect the presence of flaws which may have propagated into base metal. Accordingly, the ASME has completely eliminated the B-I-1 and B-I-2 examination categories from later editions of Section XI.

Performing these examinations only constitutes a needless exposure of personnel to radiation with no compensatory increase in safety. Quad Cities Station, therefore, will not perform the above mentioned examinations for the remainder of the present inspection interval. The examinations will not be required for subsequent intervals since the requirements have been deleted from the Code.

Evaluation

The 1977 Edition of Section XI has been referenced in 10 CFR 50.55a and inservice examinations may meet the requirements of this edition in lieu of those from previous editions with the following provisions:



- (a) Commission approval is required to update to the more recent edition (10 CFR 50.55a (g)(4)(iv)).
- (b) When applying the 1977 Edition, all of the addenda through Summer 1978 Addenda must be used.
- (c) Any requirement of the more recent edition which is related to the one(s) under consideration must also be met.

The requirements for examining closure-head cladding and vessel cladding are deleted from the 1977 Edition with addenda through Summer 1978.

Conclusions and Recommendations

Based on the above evaluation, relief from Code requirements should not be granted. Instead, pursuant to 10 CFR 50.55a(g)(4)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda for Category B-I-1 items. This approval would delete the requirement to examine these items.

References

Reference 5.

B. Pressurizer

Does not apply to BWRs.

C. Heat Exchangers and Steam Generators

No relief requests.



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D. Piping Pressure Boundary

1. Relief Request CR-5, Pressure Retaining Welds in Piping,
Category B-J, Item B4.5

Code Requirement

Volumetric weld examinations shall be performed during each inspection interval and shall cover all the area of 25% of the circumferential joints including the adjoining 1-ft. sections of longitudinal joints and 25% of the pipe branch connection joints.

Code Relief Request

Relief is requested from the volumetric examination of two inaccessible pressure-retaining piping welds. One weld is in the Control Rod Drive System (CRDS) on line number 0308-4", the other weld is in the Residual Heat Removal System (RHRS) on line number 1011-4".

Proposed Alternative Examination

No alternate or augmented examinations are feasible or necessary in this case. The examinations required by IWB-5000 will, however, be conducted in accordance with the Code.

Licensee's Basis for Requesting Relief

Two Class 1 piping welds are physically inaccessible for examination. The weld in the CRDS cannot be examined because of interference from a structural support. The weld in the RHRS is located just above the point at which the line penetrates the floor separating the reactor cavity and the drywell. The inaccessibility is due to the presence of a water barrier and sleeve arrangement. It is unlikely that these welds will be inspectable at any time during the plant life. Relief is, therefore, requested from performing the volumetric examination requirements of Section XI. The implications of this exemption are minimal due to the fact that safety margins inherent in the design of the subject welds are typical of those in all other welds in the Class 1 systems. Exempting these two welds from the total inspection sampling program will have negligible statistical significance.

Evaluation

The identified welds are completely inaccessible for either volumetric or surface examination. Hence, the Code required examinations are impractical for these welds.



The two welds are the only circumferential and longitudinal pipe welds in each of their respective systems, other than containment penetration welds, that will not be examined as required by the Code. In the CRDS, approximately 89%, and in the RHRS, approximately 93%, of all Category B-J welds will be examined as required by the Code. Overall, 95% of the approximately 470 Category B-J welds in each unit will be examined. Hence, the safety implications involved in not examining the two identified welds are minimal.

The licensee's commitment to visually examine the welds whenever pressure tests are conducted, as required by IWB-5000, should be accepted.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the welds discussed above, the Code requirements are impractical. It is further concluded that the alternative examination discussed above will provide necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from the volumetric examination of the identified welds, provided that the welds are visually examined when system leakage and hydrostatic tests are conducted as required by IWB-5000.

References

Reference 5.

2. Relief Request CR-6, Inaccessible Welds Inside Flued Heads,
Category B-J, Item B4.5

Code Requirement

Volumetric weld examinations shall be performed during each inspection interval and shall cover all of the area of 25% of the circumferential joints including the adjoining 1 ft. sections of longitudinal joints and 25% of the pipe branch connection joints.

Code Relief Request

Relief is requested from the volumetric examination of one pressure-retaining piping weld in each of the following primary containment penetration assemblies:

CRD RETURN - 0308-4" (1)

RHR - 1011-4", 1012A&B-16", 1025-20" (2)

Rx WATER CLEANUP - 1202-6" (3)

CORE SPRAY - 1403-10", 1404-10"

HPCI - 2305-10" (4)

MAIN STEAM 3001A,B,C,D-20"

FEEDWATER 3204A&B-18"

(1) CRD - Control Rod Drive

(2) RHR - Residual Heat Removal

(3) Rx - Reactor

(4) HPCI- High Pressure Coolant Injection

Proposed Alternative Examination

A visual inspection for evidence of leakage will be conducted during the system hydrotest of IWB-5000.

Licensee's Basis for Requesting Relief

As stated in 10 CFR 50.55a(g)(1) for plants whose construction permits were issued prior to January 1, 1971, components shall meet Section XI requirements to the extent



practical.' Since examination requirements for these welds did not exist at the time Quad Cities Station was designed, accessibility for their examination was not a prime consideration. Basic design constraints make it extremely impractical to examine the subject welds by volumetric or surface techniques. Commonwealth Edison feels that this constitutes a basis for relief from the volumetric examination requirements of Section XI.

The safety implications of this exemption are minimal due to the fact that the safety margins in the subject welds are typical of those in all welds in the applicable systems. Since the exempted welds represent only a small fraction of the total number of welds in these systems (15 out of 445), the statistical significance to the inspection sampling program due to exempting these welds is expected to be negligible.

Evaluation

The identified welds are completely inaccessible for volumetric or surface examination because the welds are located inside a containment penetration. Each primary containment penetration assembly, due to its design, leaves one pressure retaining piping weld inaccessible for examination by either surface or volumetric means. The welds can only be examined by inspecting for evidence of leakage during system hydrotests.

The initial design of the assemblies did not provide for accessibility for inservice examinations. If it is assumed, though, that the workmanship and quality assurance of the welding as well as the preservice examinations were adequate, then an examination of the first pressure boundary weld outside the containment should reflect service induced failures for that particular piping section. Thus, the first pressure boundary weld outside the containment on each of these process pipes could be volumetrically examined, where practical, over 100% of its length during each inspection interval. Such an examination would maintain sample size. Also, the licensee's commitment to conduct visual examinations at these penetrations should be accepted.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the welds discussed above, the Code requirements are impractical. It is further concluded that the alternative examination discussed in the above evaluation will provide necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from the volumetric examination of the identified welds with the following provisions:



- (a) The first pressure boundary weld outside the containment on each of these process pipes should be volumetrically examined, where practical, over 100% of its length during each inspection interval.
- (b) The proposed visual examinations should be performed on the containment penetration assemblies when leakage and hydrostatic tests are conducted in accordance with IWB-1220(c).

References

References 5, 6 and 7.



3. Relief Request CR-7, Pressure Retaining Branch Pipe Connection Welds, Category B-J, Items B4.6 and B4.7

Code Requirement

The examinations performed during each inspection interval shall cover all of the area of 25% of the circumferential joints including the adjoining 1 ft. sections of longitudinal joints and 25% of the pipe branch connection joints.

In the case of pipe branch connections, the areas shall include the weld metal, the base metal for one pipe wall thickness beyond the edge of the weld on the main pipe run, and at least 2 in. of the base metal along the branch run.

<u>Item No.</u>	<u>Examination</u>
B4.6, exceeding 6-inch diameter	Volumetric
B4.7, 6-inch diameter and under	Surface

Code Relief Request

Relief is requested from the examination of the following branch pipe connection welds in which reinforcement saddles are used:

<u>No. of Welds for which Relief is Requested</u>	<u>System</u>	<u>Line Size</u>	<u>Branch Pipe Connection Size</u>	<u>Examination Requirement</u>
1	Main Steam	20"	10"	Volumetric
2	Feedwater	18"	12"	Volumetric
1	Residual Heat Removal	20"	6"	Surface

Proposed Alternative Examination

A visual examination of these joints for evidence of leakage will be conducted during the pressure tests required by IWB-5000.

Licensee's Basis for Requesting Relief

The design of these Class 1 branch pipe connection welds calls for the use of reinforcement saddles. These saddles are fillet welded over the actual pressure retaining branch pipe to



main pipe weld, completely encasing it. The fabrication of these joints precludes any type of surface examination or meaningful volumetric examination. Additional assurance of the continued integrity of joints fabricated in this fashion is afforded by the fact that the reinforcement saddle strengthens the joint and reduces the stresses on the internal weld.

Evaluation

The identified welds are completely inaccessible for either volumetric or surface examination. Hence, the Code required examinations are impractical for these welds.

However, surface examinations of the fillet welds on the saddles could be performed as an alternative examination. This could provide additional information relative to service-induced stresses in the general location of the welds for which relief is requested.

In the Main Steam System, the identified weld is the only Category B-J weld in that system, other than containment penetration welds, that will not be examined as required by Code. In the Main Steam System, 93% of all Category B-J welds will be examined.

In the Feedwater System, the two identified welds are the only Category B-J welds in that system, other than containment penetration welds, that will not be examined as required by the Code. In the Feedwater System, 93% of all Category B-J welds will be examined.

In the Residual Heat Removal System, the identified weld is the only one of two Category B-J welds in that system, other than containment penetration welds, that will not be examined as required by Code. In the Residual Heat Removal System, 93% of all Category B-J welds will be examined.

Overall, 95% of the approximately 470 Category B-J welds in each unit will be examined. Hence, the safety implications involved in not examining the four identified welds are minimal.

The licensee's commitment to visually examine the welds whenever pressure tests are conducted, as required by IWB-5000, should be accepted.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the welds discussed above, the Code requirements are impractical. It is further concluded that the alternative examinations discussed above will provide necessary added assurance of structural reliability. Therefore, the following is recommended:



- (a) Relief should be granted from the volumetric examination of the identified welds.
- (b) Surface examination of the saddle fillet welds should be performed in lieu of the Code required examination.
- (c) Visual examination of the identified welds should be performed during leakage and hydrostatic tests when conducted as required by IWB-5000.

References

Reference 5.



Science Applications, Inc.

4. Relief Request CR-8, Integrally Welded Support Members for Piping, Valves and Pumps, Category B-K-1, Items B4.9, B5.4 and B6.4

Code Requirement

The volumetric examination performed during each inspection interval shall cover 25% of the integrally welded supports. The areas shall include the integrally welded external support attachments. This includes the welds to the pressure retaining boundary and the base metal beneath the weld zone and along the support attachment member for a distance of two support thicknesses.

Code Relief Request

Relief is requested from the volumetric examination of ten integrally welded external support attachments for piping, valves and pumps. Specifically, six are welded to the recirculation pump casings, two are welded to the bodies of recirculation valves 0202-5A and 5B, and two are welded to stainless steel crosses in the recirculation ring header piping.

Proposed Alternative Examination

Integrally welded support attachments will be surface examined in place of ultrasonic examinations.

Licensee's Basis for Requesting Relief

In the Class 1 system there are ten integrally welded supports whose support lugs are welded to cast stainless steel components. The high ultrasonic beam attenuation of the cast stainless steel base material and the weld geometry inhibit meaningful examination of the ten subject support attachments by either ultrasonic or radiographic methods. The substitution of a surface examination, however, would be sufficient to determine the integrity of these attachment welds and the surrounding base metal since flaws which would be expected to occur in these areas would originate from the outer surface.

Evaluation

Because of the weld design, i.e., fillet welds, ultrasonic examination required by the Code is impractical. As an alternative examination the licensee has committed to subject these welds to surface examination. Based on the loading conditions of these types of welds, any flaws would most likely be generated at the weld surface and thus be detectable by surface examination.



- Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the welds discussed above, the code requirements are impractical. It is further concluded that the alternative examination discussed above will provide necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from the volumetric examination of the identified welds, provided that the welds are surface examined.

References

Reference 5.



E. Pump Pressure Boundary

1. Integrally Welded Supports for Pumps, Category B-K-1, Item B5.4

The request for relief from volumetric examination of integrally welded supports for piping, valves and pumps (see I.D.4 of this report) applies here. Therefore, the following is recommended:

Relief should be granted from the volumetric examination of the six identified pump support welds, provided that the welds are surface examined.

2. Relief Request CR-9, Reactor Recirculation Pumps, Category B-L-2, Item B5.7

Code Requirement

Visual examination of pump internal pressure boundary surfaces.

One pump in each of the group on pumps performing similar functions in the system shall be examined during each inspection interval. The examinations may be performed at or near the end of the inspection interval.

Code Relief Request

Relief is requested from the visual examination of the internal surfaces of the reactor recirculation pump at the pressure boundary.

Proposed Alternative Examination

As standard maintenance practice dictates, when a pump of this type is disassembled for maintenance, examination of the pump internals and internal pressure boundary surfaces will be performed, to the extent practical.

Licensee's Basis for Requesting Relief

Each Quad Cities Unit has an ISI Class-1 recirculation pump in each of the two 28-inch diameter recirculation loops. These pumps function during normal reactor operation to provide forced recirculation through the core.

The basis for this relief request is predicated on the following two points:



- (a) To complete the subject examination, large expenditures of man-hours and man-rem are required with essentially no compensating increase in plant safety.
- (b) The structural integrity afforded by the pump casing material utilized will not significantly degrade over the lifetime of the pump.

Based on data compiled from an actual recirculation pump disassembly, it is expected that approximately 1000 man-hours and 50 man-rem exposure would be required to disassemble, inspect and reassemble one pump. Performing this visual examination under adverse conditions such as high dose rate (30-40 R/hr) and poor as-cast surface condition, realistically, provides little additional information as to the pump casing integrity.

The recirculation pump casing material, cast stainless steel (ASTM A351-CF-8), is widely used in the nuclear industry and has performed extremely well. The presence of some delta ferrite (typically 5% or more) imparts substantially increased resistance to intergranular stress corrosion cracking. The delta ferrite also results in improved pitting corrosion resistance in chloride containing environments.

Quad Cities Station has disassembled one pump for maintenance. This pump (Unit 2-2A-202) was disassembled to replace the pump bowl to cover gasket. While disassembled, the pump was visually inspected to the extent practical and no degradation of the pressure boundary surfaces was noted. This disassembly and inspection was completed in February 1978 which was approximately five years into the first Inspection Interval.

Commonwealth Edison feels that adequate safety margins are inherent in the basic pump design and that the health and safety of the public will not be adversely effected by performing the visual examination of the pump internal pressure boundary surfaces only when the pumps are required to be disassembled for maintenance.

Evaluation

The visual examination is to determine whether unanticipated severe degradation of the casing is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous experience during examinations of pumps at other plants has not shown any significant degradation of casings.

The disassembly of the reactor recirculation pumps to the degree necessary to inspect the internal pressure retaining surfaces is a major effort, involving large personnel exposures



and the generation of large amounts of radioactive waste. In view of the effort required to disassemble a pump, the information returned from visual examination of its internal surfaces would be marginal.

The licensee has committed to the concept of visual examination of the pump is disassembled for maintenance. Meanwhile, pressure and flow are monitored during pump operation to assess performance. This commitment by the licensee should be accepted. Under this commitment, a Unit 2 pump has already been disassembled and examined.

The visual examination of the internal pressure boundary may be performed at or near the end of the 10-year inspection interval.

The Code committee and the Electric Power Research Institute (EPRI) are undertaking a program to assemble and evaluate results of visual examinations of internal pump casing surfaces. Within the next two years, this program should provide a more definitive basis for the Code committee and NRC for upholding or modifying this Code requirement. Since so many licensees consider this requirement impractical and an undue burden, it is reasonable to postpone a decision to grant relief until at least preliminary results from that program become available. Since the end of the current inspection interval for Quad Cities Unit 1 is February 18, 1983, this may require extending the inspection interval by one year as permitted by IWA-2400(a).

Visual examination of the externals of the pump casing could also be conducted for leakage when pressure tests are performed as required by IWB-5000.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the Code required internal visual examination discussed above, a more definitive technical basis is needed. Therefore, the following is recommended:

- (a) Relief should not be granted at this time for Quad Cities Unit 1 from the visual examination of the internal surfaces of a reactor recirculation pump at the pressure boundary.
- (b) The licensee's proposal to perform a visual examination whenever the surfaces are made accessible because a pump is disassembled for maintenance purposes should be accepted.
- (c) Visual examination of the externals of the pump casings should be conducted for evidence of leakage when pressure tests are performed as required by IWB-5000.

References

References 5, 6 and 7.



F. Valve Pressure Boundary

1. Relief Request CR-3, Class 1 and 2 Bolting, Categories B-G-1, B-G-2, and C-D; Items B6.1 and B6.2, and C1.4, C2.4 and C4.2

Code Requirement

Category B-G-1: Pressure-Retaining Bolting, 2-Inches and Larger in Diameter

The areas shall include bolts, studs, nuts, bushings, washers, and threads in base material and flange ligaments between threaded stud holes.

The examination performed during each inspection interval shall cover 100% of the bolts, studs, nuts, bushings, and threads in base material and flange ligaments between threaded stud holes.

Bushings, threads, and ligaments in base material of flanges are required to be examined only when the connection is disassembled.

Bolting may be examined either in place under tension, when the connection is disassembled, or when the bolting is removed.

<u>Item No.</u>	<u>Components and Parts to be Examined</u>	<u>Examination Method</u>
B6.1	Valve Pressure Retaining Bolting, in place	Volumetric
B6.2	Valve Pressure Retaining Bolting, when removed	Volumetric and Surface

Category B-G-2: Pressure Retaining Bolting, Smaller Than 2-Inches in Diameter

The areas shall include bolts, studs, and nuts.

The visual examinations shall be performed during each inspection interval and shall cover 100% of the bolts, studs, and nuts.

Bolting may be examined either in place under tension when the connection is disassembled, or when the bolting is removed.

Category C-D: Pressure Retaining Bolting Exceeding 1 Inch in Diameter

The areas shall include bolts, studs, nuts, bushings, washers, and threads in base material and flange ligaments between threaded stud holes.



Visual examinations performed during each inspection interval shall cover 100% of the bolts, studs, nuts, bushings, and threads in base material and flange ligaments between threaded stud holes.

Nondestructive examinations shall be performed on 10% of the bolting in each joint, but not less than two bolts or studs per joint.

Bushings, threads, and ligaments in base material of flanges are required to be examined only when the connection is disassembled.

Bolting may be examined either in place under tension when the connection is disassembled, or when the bolting is removed.

<u>Item No.</u>	<u>Components and Parts to be Examined</u>	<u>Examination Method</u>
C1.4	Pressure Vessels Pressure Retaining Bolting	Visual and either Surface or Volumetric
C2.4	Piping Pressure Retaining Bolting	Visual and either Surface or Volumetric
C4.2	Valves Pressure Retaining Bolting	Visual and either Surface or Volumetric

Code Relief Request

Licensee requests permission to update to the 1977 Edition Summer 1978 Addenda of the Code for Categories B-G-1, B-G-2 and C-D.

Proposed Alternative Examination

Visual examinations will be performed as specified in the appropriate Code Category for the bolting shifted from Category B-G-1 to B-G-2. No alternate or augmented examinations are required for the bolting affected in Category C-D.

Licensee's Basis for Requesting Relief

This request for relief involves substitution of requirements from later Editions of the ASME Code. Adopting the more practical requirements from these later editions will provide continuity between the inspection program for this period and the program for subsequent intervals while reducing overall radiation exposure to inspection personnel. Plant safety margins will be unaffected by this change since modifications in the Code requirements are technically justified.



Evaluation

The 1977 Edition, Summer 1978 Addenda, of Section XI has been referenced in 10 CFR 50.55a and inservice examinations may meet the requirements of this edition in lieu of those from previous editions with the following provisions:

- (a) Commission approval is required to update to the more recent edition (10 CFR 50.55a(g)(4)(iv));
- (b) When applying the 1977 Edition, all of the addenda through Summer 1978 Addenda must be used;
- (c) Any requirement of the more recent edition which is related to the one(s) under consideration must also be met.

The requirements for examining Class 2 bolting 2-inches in diameter and less are deleted from the 1977 Edition with addenda through Summer 1978, but volumetric examination is substituted for visual examination of bolts and studs of larger diameters. Class 1 bolting exactly 2-inches in diameter is shifted from Category B-G-1 to Category B-G-2. This shift substitutes visual for volumetric (and in some cases, surface) examinations in virtually all instances, as shown in the above Code requirement.

Recommendations

Pursuant to 10 CFR 50.55a(g)(4)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda, for Category B-G-1, B-G-2, and C-D items. This approval would delete the requirement to examine Class 2 bolting 2-inches in diameter and less and would shift Class 1 bolting of exactly 2-inches in diameter from Category B-G-1 to B-G-2.

References

Reference 5.



2. Integrally Welded Supports for Valves, Category B-K-1,
Item B6.4

The request for relief of volumetric examination of integrally welded supports for piping, valves, and pumps (see I.D.4 of this report) applies here. Therefore, the following is recommended:

Relief should be granted from the volumetric examination of the two identified valve support welds, provided the welds are surface examined.

3. Relief Request CR-10, Internal Surfaces of Valves, Category
B-M-2, Item B6.7

Code Requirement

Visual inspection shall be performed on the internal pressure boundary surfaces, on valves exceeding 4-in. nominal pipe size.

One valve in each group of valves of the same constructional design, e.g., globe, gate, or check valve, manufacturing method and manufacturer that performs similar functions in the system shall be examined during each inspection interval.

The examinations may be performed at or near the end of the inspection interval.

Code Relief Request

Relief is requested from the visual examination of the internal surfaces at the pressure boundary of the Class 1 valves exceeding 4-inch diameter nominal pipe size.

Proposed Alternative Examination

An examination of the internal pressure boundary surfaces will be performed, to the extent practical, each time a valve is disassembled for maintenance purposes.

Licensee's Basis for Requesting Relief

In the Class 1 system there are 51 valves which are greater than four inches nominal pipe size. These valves vary in size, design and manufacturer but are all manufactured from either cast stainless steel or carbon steel. None of the valve body casings are welded.



The requirement to disassemble primary system valves for the sole purpose of performing a visual examination of the internal pressure boundary surfaces has only a very small potential of increasing plant safety margins and a very disproportionate impact on expenditures of plant manpower and radiation exposure.

Performing these visual examinations under such adverse conditions as high dose rates (10 R/hr) and poor as-cast surface condition, realistically, provides little additional information as to the valve casing integrity.

For approximately 20 percent of these valves, the reactor vessel core must be completely unloaded and the vessel drained to permit disassembly for examination.

The performance of both carbon and stainless cast valve bodies has been excellent in all BWR applications. Based on this experience and both industry and regulatory acceptance of these alloys, continued excellent service performance is anticipated.

A more practical approach that would essentially provide an equivalent sampling program and significantly reduce radiation exposure to plant personnel is to examine the internal pressure boundary of only those valves that require disassembly for maintenance purposes. This would still provide a reasonable sampling of primary system valves and give adequate assurance that the integrity of these components is being maintained.

Evaluation*

The disassembly of large valves to the degree necessary to inspect the internal pressure retaining surfaces (bodies) is a major effort in terms of exposure of personnel. To do this disassembly solely to perform a visual examination of the internal body is impractical. The visual examination specified is to determine whether unanticipated severe degradation of the body is occurring due to phenomena such as erosion or corrosion.

The licensee has committed to the concept of visual examination each time a valve is disassembled for maintenance. This commitment by the licensee should be accepted. Under this commitment, the licensee has already examined at least one valve in seven out of nine valve groups for Unit 1, and in eight out of nine valve groups for Unit 2.

* Since the licensee is so close to the end of his interval, he has been asked to submit a more specific relief request on these valves.



The visual examination of the internal pressure boundary may be performed at or near the end of the 10-year inspection interval. The first intervals for Quad Cities Units 1 and 2 end in February and March 1983, respectively. Therefore, the licensee will be in compliance with the Regulation up to that time. Now that the end of the interval is approaching, the licensee should submit a new relief request for each valve classification for which a valve has not been disassembled and examined.

For those valve classifications that require examination and for which valve maintenance has not occurred in an inspection interval, visual examinations should be performed on one valve in each such classification when the system pressure tests (IWA-5000) are conducted in accordance with the requirements for Category B-P.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the valves discussed above, there is not presently enough justification for granting relief from impractical code requirements. Therefore, the following is recommended:

- (a) Relief should not be granted at this time from visual examination of the internal pressure boundary surfaces on valves exceeding 4-in. nominal pipe size.
- (b) The licensee's proposal to perform the Code required examinations whenever the valves are opened for maintenance should be accepted.
- (c) During other inspection periods, the licensee should perform visual examinations for leakage when the system pressure tests (IWA-5000) are conducted in accordance with the requirements for Category B-P.
- (d) Now that the end of the inspection interval is approaching, the licensee should submit specific relief requests for each valve classification for which a valve has not been disassembled and examined in each unit.

References

References 5, 6 and 7.



II. CLASS 2' COMPONENTS

A. Pressure Vessels

1. Relief Request CR-11, Pressure Retaining Nozzle Welds in the RHR Heat Exchangers, Category C-B, Item C1.2

Code Requirement

Volumetric examination of 100% of the nozzle-to-vessel attachment welds, for the equivalent of one Residual Heat Removal (RHR) Heat Exchanger, shall be performed over the 40-year inspection interval.

Code Relief Request

Relief is requested from the volumetric examination of two of four nozzle-to-vessel welds on the two RHR Heat Exchangers each for Units 1 and 2.

Proposed Alternative Examination

A visual examination for evidence of leakage will be conducted in accordance with the Subsection IWC-5000 requirements.

Licensee's Basis for Requesting Relief

There are two 18" diameter nozzles in the Class 2 portion of each of the two RHR System Heat Exchangers that are fabricated with reinforcement saddles. These saddles are fillet welded over the actual pressure retaining nozzle-to-shell weld.

The fabrication of these nozzle-to-shell welds precludes any type of volumetric or surface examination. The design does, however, provide additional strength at the joint and results in lower stresses at the internal weld. Integrity of these joints will be monitored by periodic system pressure and hydrostatic tests.

The reinforcement saddles were fabricated with drilled vent holes. These holes provide a means to determine if the obstructed pressure retaining weld has developed any through wall defect. This vent hole will be observed during the required Section XI, IWC-5000 pressure tests. Commonwealth Edison Company feels that this inspection program provides for adequate margins of safety in the continued use of the heat exchangers.

Evaluation

The welds required to be examined are completely covered by a reinforcing ring that prevents a volumetric examination as required by the Code. The ring is welded to the



shell and to the nozzle with fillet welds. The licensee could perform a surface examination on the reinforcing ring welds which are completely accessible. Weld cracking of these outer fillet welds would be detected by the surface examination, and thus some measure of structural reliability of the pressure-retaining weld could be assessed.

Visual examinations of the welds during periodic hydrostatic testing would provide additional assurance that an adequate level of safety will be maintained.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the welds discussed above, the code requirements are impractical. It is further concluded that the alternative examinations discussed above will provide necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted based on the following provisions:

- (a) An alternative surface examination of the reinforcing ring welds is performed, and
- (b) Visual examination of the welds is performed during periodic hydrostatic testing in accordance with IWC-5000.

References

References 5, 6 and 7.



2. Class 2 Bolting, Category C-D, Item C1.4

The request to update to the 1977 Edition, Summer 1978 Addenda, for Class 1 and 2 bolting (see I.F.1 of this report) applies here. Therefore, the following is recommended:

Pursuant to 10 CFR 50.55a(g)(4)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda, for Category C-D items. This approval would delete the requirement to examine Class 2 bolting 2-in. in diameter and less.

B. Piping

1. Class 2 Bolting, Category C-D, Item C2.4

The request to update to the 1977 Edition, Summer 1978 Addenda, for Class 1 and 2 bolting (see I.F.1 of this report) applies here. Therefore, the following is recommended:

Pursuant to 10 CFR 50.55a(g)(v)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda, for Category C-D items. This approval would delete the requirement to examine Class 2 bolting 2-in. in diameter and less.

C. Pumps

No relief requests.



D. Valves

1. Class 2 Bolting, Category C-D, Item C4.2

The request to update to the 1977 Edition, Summer 1978 Addenda, for Class 1 and 2 bolting (see I.F.1 of this report) applies here. Therefore, the following is recommended:

Pursuant to 10 CFR 50.55a(g)(4)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda, for Category C-D items. This approval would delete the requirement to examine Class 2 bolting 2-in. in diameter and less.

III. CLASS 3 COMPONENTS

No relief requests.



IV. PRESSURE TESTS

A. General

1. Relief Request CR-12, System Pressure Tests

Code Requirement

IWA-5210(a): The pressure-retaining components shall be visually examined while the system is under the hydrostatic test pressure and temperature. The test pressure and temperature shall be maintained for at least four hours prior to the performance of the examinations.

IWA-5220(a): The system hydrostatic test pressure shall be at least 1.25 times the system design pressure (P_D) and conducted at a test temperature not less than 100°F except as may be required to meet the test temperature requirements of IWA-5230.

IWD-5200(a): The system test pressure shall be at least 1.10 times the system design pressure.

Code Relief Request

Licensee requests permission to adopt the following pressure testing requirements:

- (a) The requirements of IWC&D-5200(a)* in the 1974 Edition of the ASME Code, Section XI will be replaced with the following: The system hydrostatic test pressure shall be at least 1.10 times the system pressure P_{SV} for systems with design temperature of 200°F or less, and at least 1.25 times the system pressure P_{SV} for systems with design temperature above 200°F. The system pressure P_{SV} is defined as the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested.
- (b) The following requirements regarding the holding time after pressurization (before visual examination) will be adopted for clarity:
 - (1) System Leakage Tests - no holding time required after attaining test pressure and temperature conditions.
 - (2) System Functional Tests - 10 minutes after attaining the system operating pressure.

*Subarticles IWC-5220 and IWD-5200 are the only paragraphs under Articles IWC-5000 and IWD-5000, respectively.



- (3) System Inservice Tests - no holding time required, provided the system has been in operation for at least 4 hours.
- (4) System Hydrostatic Tests - 4 hours after attaining the test pressure and temperature conditions for insulated systems, and 10 minutes for noninsulated systems or components.
- (5) System Pneumatic Tests - 10 minutes after attaining the test pressure.

Proposed Alternative Examination

No alternate or augmented examinations are necessary in this case.

Licensee's Basis for Requesting Relief

The pressure retaining components within each system boundary are subject to system pressure tests. These test requirements are not only an important part of inservice inspection but also demand clarity in their application. The hydrostatic test requirements in the 1974 Edition of Section XI are not as definitive as in later editions and addenda of the Code and for this reason, misinterpretation or misapplication could occur.

The later editions of the Code have revised various requirements regarding these system pressure tests which Quad Cities Station feels are more practical to implement. This request for relief involves the substitution of requirements from later Editions of the ASME Code. Substituting these more definitive and practical requirements will not only provide continuity between the inspection program for this period and the program for subsequent intervals, but will also help reduce radiation exposure to inspection personnel. Plant safety margins will be unaffected by these substitutions since modification in the Code requirements are technically justified.

Evaluation

The 1977 Edition of the Section XI has been referenced in 10 CFR 50.55a and inservice examinations may meet the requirements of this edition in lieu of those from previous editions with the following provisions:

- (a) Commission approval is required to update to the more recent edition (pursuant to 10 CFR 50.55a(g)(4)(iv));
- (b) When applying the 1977 Edition, all of the addenda through Summer 1978 Addenda must be used;



- (c) Any requirement of the more recent edition which is related to the one(s) under consideration must also be met.

The terms of the licensee's Code relief request are covered verbatim in the Summer 1978 Addenda, 1977 Edition, as follows:

- (a) for system hydrostatic test by Subparagraphs IWC-5222(a) and IWD-5223(a),
(b) for test condition holding time by Paragraph IWA-5213.

The use of Paragraph IWA-5213 invokes various types of tests for which other requirements are discussed in other parts of Subsubarticle IWA-5210 and elsewhere in Subsection 5000 rules. To be consistent with criterion (c) above on updating, the licensee should adopt all Subsection 5000 rules for system pressure tests.

Recommendations

Based on the above evaluation, relief from Code requirements should not be granted. Instead, pursuant to 10 CFR 50.55a (g)(4)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda, for all Subsection 5000 rules. This approval would not only cover the intent of the licensee's request for relief, but would clarify and simplify all the requirements for system pressure tests.

References

Reference 5.

- B. Class 1 System Pressure Tests
No relief requests.
- C. Class 2 System Pressure Tests
No relief requests.
- D. Class 3 System Pressure Tests
No relief requests.



V. GENERAL

A. Ultrasonic Examination Techniques

1. Relief Request CR-13, Calibration Blocks

Code Requirement

I-3121 Block Selection:

Material from which the block is fabricated shall be from one of the following: (1) the component prolongation, or (2) (when it is not possible to fabricate the block from material taken from the component) from a material of a specification included in the applicable examination volumes of the component. The acoustic velocity and attenuation of such a block shall be demonstrated to fall within the range of straight beam longitudinal wave velocity and attenuation found in the component.

Code Relief Request

Licensee requests relief from the requirement of documentation to specify traceability of the reactor vessel calibration block material to a material specification.

Proposed Alternative

All future calibration blocks will be fabricated from material having the appropriate documentation as required by the Code in effect at the time of procurement.

Licensee's Basis for Requesting Relief

Quad Cities Station currently utilizes a reactor vessel calibration block which lacks documentation consistent with the requirements of current editions of the Code. The documentation requirements existing at the time of its fabrication did not require traceability to the material's chemical or physical certifications. As a result, the only documentation available for the existing block is verification of the appropriate P-number grouping.

Previous inservice inspections have been performed utilizing the above mentioned block and its use would provide continuity in the ISI Program. It would be impractical to fabricate a new calibration block in order to satisfy the documentation requirements of the current Code. Existing records which indicate the appropriate material P-grouping provide adequate



assurance that the block will establish the proper ultrasonic calibration and sensitivity.

Evaluation*

The licensee does not have documentation to demonstrate the traceability to the material's chemical or physical certifications. The calibration block has been used for previous inservice inspections, hence the records to date are based on this block. Records exist which verify the appropriate P-number grouping for the block. This provides assurance that the block will establish the proper ultrasonic calibration and sensitivity.

It would be impractical to fabricate a new calibration block to satisfy the documentation requirements of the Code, as it would require abandoning all previous data accumulated from the earlier inservice inspections.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the calibration block discussed above, the Code requirements are impractical. It is further concluded that the alternative discussed above will provide necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from the Code required method of calibration block fabrication, provided the method proposed by the licensee is adopted.

References

References 5, 6 and 7.

*This evaluation was based on the revised CR-13 as outlined in Reference 7. This revision has not yet been received. The anticipated revision excludes piping calibration blocks.



2. Relief Request CR-14, Ultrasonic Recording Sensitivity,
Class 1 and Class 2

Code Requirement

ASME Code Section XI (1974 Edition), Paragraph IWA-2232, Ultrasonic Examination: "Ultrasonic examination shall be conducted in accordance with the provisions of Appendix I. Where Appendix I (I-1200) is not applicable, the provisions of Article 5 of Section V shall apply."

ASME Code Section V (1974 Edition), Paragraph T-537, Evaluation of Indications: "All indications which produce a response greater than 20% of the reference level shall be investigated to the extent that the operator can evaluate the shape, identity, and location of all such reflectors in terms of the acceptance-rejection standards of the referencing Code Section."

Code Relief Request

Relief is requested from recording all responses greater than 20% of the reference level when ultrasonically examining all pressure-retaining welds in piping.

Proposed Alternative Examination

For examinations conducted to the requirements of Article 5 of Section V, the recording level shall be 50% of the reference level and all indications exceeding 100% of the reference level shall be investigated to the extent that the operator can determine the shape, identity and location of all such reflectors in terms of the acceptance-rejection standards of Section XI.

Licensee's Basis for Requesting Relief

The rules of Article 5 of Section V recommend that UT indications which produce a response greater than 20% of the reference level be investigated to the extent that the operator can evaluate the shape, identity and location of all such reflectors in terms of the acceptance-rejection standards of Section XI.

The ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition through Summer 1975 Addenda states that the provisions of Article 5 of Section V shall apply where Appendix I is not applicable. However, in later editions of Section XI, the rules of Article 5, Section V were amended such that only reflectors producing a response greater than 50% of the



reference level are to be recorded, and that all reflectors producing a response greater than 100% of the reference level shall be investigated to the extent that the operator can determine the shape, identity and location of all such reflectors in terms of the acceptance-rejection standards of Section XI.

As a result of the "noise" level in the typical UT response and the weld geometries present, no meaningful information is obtained from indications producing responses less than 50% of the reference level. Therefore, adopting the more current and practical requirements of Section XI is justified. In fact, the requirement to record these non-relevant indications results in excessive examination times and personnel radiation exposures. It is felt that the levels for recording and evaluating indications specified in the later Codes are adequate and sufficiently reliable in detecting flaws.

Evaluation

Recording and evaluating indications at 20% of the reference level is impractical for the following reasons:

- (1) The welded joints in nuclear piping frequently contain Code-allowable wall thickness differences (12% of nominal thickness) as well as some weld drop-through, counterbore taper, crown height, etc. These conditions generate an extremely large number of geometric reflectors which produce UT indications greater than 20% of the reference level.
- (2) Weld metal in stainless steel piping contains reflectors due to the metallurgical structure which produce a large number of UT indications.
- (3) All examination personnel experience radiation exposure during inservice examinations. The Section V requirement to record and evaluate UT indications at the 20% level places an unnecessary burden on the limited number of experienced and qualified examiners available to the Owner.

The 1977 Edition of Section XI has been referenced in 10 CFR 50.55a and inservice examinations may meet the requirements of this edition in lieu of those from previous editions with the following provisions:

- (a) Commission approval is required to update to the more recent edition (pursuant to 10 CFR 50.55a(g)(4)(iv));
- (b) When applying the 1977 Edition, all of the addenda through Summer 1978 Addenda must be used;
- (c) Any requirement of the more recent edition which is related to the one(s) under consideration must also be met.

Updating to the 1977 Edition (Summer 1978 Addenda), Paragraph IWA-2232 is acceptable with one additional requirement. This paragraph includes the following:

- (1) For examination of welds, reflectors that produce a response greater than 50% of the reference level shall be recorded. (IWA-2232(c)(1))
- (2) For examination of welds, all reflectors which produce a response greater than 100% of the reference level shall be investigated to the extent that the operator can determine the shape, identity, and location of all such reflectors in terms of the acceptance-rejection standards of IWA-3100(b). (IWA-2232(c)(2))
- (3) The size of reflectors shall be measured between points which give amplitudes equal to 100% of the reference level. (IWA-2232(c)(3)).

In addition, indications of 20% of reference level or greater which are interpreted to be a crack must be identified and evaluated to the rules of Section XI.

The licensee's request for relief is covered by Subparagraphs IWA-2232(c)(1) and (2) above.

Recommendations

Based on the above evaluation, relief should not be granted. Instead, pursuant to 10 CFR 50.55a(g)(4)(iv), approval should be granted to update to the requirements of the 1977 Edition, Summer 1978 Addenda, for Paragraph IWA-2232, with the additional provision that indications 20% of reference level or greater which are interpreted to be a crack, must be identified and evaluated to the rules of Section XI.

References

Reference 5.

B. Exempted Components

1. Code Exemption 4, IWC-1220(a), Components Exempted from Examination Based on Pressure and Temperature

Code Requirement

1974 Edition Section XI - IWC-1220(a): The following components may be exempted from the examination requirements of IWC-2520:

- (a) Components in systems where both the design pressure and temperature are equal to or less than 275 psig and 200°F, respectively.

1977 Edition Section XI (Summer 1979 Addenda) - IWC-1220(b):

The following components shall be exempted from the inservice examination requirements of IWC-2500:

- (b) Components of systems or portions of systems, other than Residual Heat Removal Systems and Emergency Core Cooling Systems, that are not required to operate above a pressure of 275 psig (1900 kPa) or above a temperature of 200°F (93°C).

Exemption

Exemption from examination of piping welds in the Residual Heat Removal System (RHRS) and Emergency Core Cooling Systems (ECCS) is claimed according to IWC-1220(a), 1974 Edition of Section XI.

Evaluation

Paragraph IWC-1220(b) of Section XI, 1977 Edition, Summer 1978 Addenda, does not permit the exemption from examination of components in the ECCS and the RHRS that operate below 275 psig or below 200°F. Hence, low operating pressure and temperature is not an acceptable basis for exempting ECCS and RHRS components from inservice examination.

Components in the RHRS and the ECCS cannot be exempted under IWC-1220(a). It is required that a representative sample of welds on these components be examined.



Conclusions and Recommendations

Based on the above evaluation, it is concluded that components in the RHRS and ECCS should not be exempted. The licensee should include a representative sample of welds on the RHRS and ECCS components in the Inservice Inspection Program.

References

Reference 5.

C. Other

None.



REFERENCES

1. D. L. Ziemann (NRC) to R. L. Bolger (CE), Quad Cities Station Units 1 and 2, April 28, 1976.
2. R. L. Bolger (CE) to B. C. Rusche (NRC), Quad Cities Station Units 1 and 2, Technical Specifications for Facility Operating Licenses, DPR-29 and DPR-30 to Incorporate Requirements of 10 CFR 50.55a, NRC Docket Nos. 50-254 and 50-265, September 10, 1976.
3. D. L. Ziemann (NRC) to R. L. Bolger (CE), Quad Cities Station Units 1 and 2, November 24, 1976.
4. C. Reed (CE) to Director NRR (NRC), Quad Cities Station Units 1 and 2 Proposed Amendment to Facility Operating Licenses Nos. DPR-29 and DPR-30 Regarding Inservice Inspection, April 18, 1979.
5. R. F. Janecek (CE) to Director NRR (NRC), Quad Cities Station Units 1 and 2 Inservice Inspection Program, NRC Docket Nos. 50-254 and 50-265, July 25, 1979.
6. D. B. Vassallo (NRC) to L. DelGeorge (CE), Quad Cities Nuclear Power Station, Units 1 and 2, April 15, 1979.
7. T. J. Rausch (CE) to D. B. Vassallo (NRC), Quad Cities Station Units 1 and 2, Response to NRC Request for Information Concerning Inservice Inspection, NRC Docket Nos. 50-254 and 50-265, June 15, 1982.



UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-254 AND 50-265

COMMONWEALTH EDISON COMPANY

NOTICE OF GRANTING RELIEF FROM ASME CODE SECTION XI

INSERVICE INSPECTION REQUIREMENTS

The U.S. Nuclear Regulatory Commission (the Commission) has granted relief from certain requirements of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to Commonwealth Edison Company, which revised the inservice inspection program for the Quad Cities Nuclear Power Station, Units 1 and 2, located in Rock Island County, Illinois. The ASME Code requirements are incorporated by reference into the Commission's Rules and Regulations in 10 CFR Part 50. The relief is effective as of the date of issuance.

This action provides relief from performing certain inspections as required by the ASME Code, Section XI that are impractical because of the facility design. Alternative inspections and testing will be performed where practicable.

The request for relief complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations. The Commission has made appropriate findings as required by the Act and the Commission's regulations in 10 CFR Chapter I, which are set forth in the letter granting relief and accompanying Safety Evaluation.

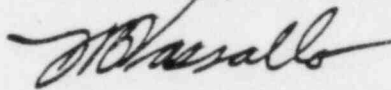
The Commission has determined that the granting of this relief will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

- 2 -

For further details with respect to this action, see (1) the letters from Commonwealth Edison Company dated July 25, 1979 and June 15, 1982, (2) the letter to Commonwealth Edison Company dated **MAY 19 1983**, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Moline Public Library, 504 17th Street, Moline, Illinois. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland, this 19th day of May 1983.

FOR THE NUCLEAR REGULATORY COMMISSION



Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing