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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
UNITS 1 and 2

INSERVICE INSPECTION PROGRAM
TECHNICAL EVALUATION REPORT

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TECHNICAL EVALUATION REPORT
INSERVICE INSPECTION PROGRAM

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INTRODUCTION

This report evaluates requests for relief from Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code* submitted to the Nuclear Regulatory Commission (NRC) by the licensee, Northern States Power Company (NSP), for the Prairie Island Nuclear Generating Plant, Units 1 and 2. The relief requests cover the second 120-month inspection interval starting December 16, 1983, for Unit 1 and December 21, 1984, for Unit 2. The requests are based upon the 1980 Edition of Section XI with addenda through the Winter of 1981, as specified in the applicable revision of 10 CFR 50.55a.

The rest of this introduction summarizes (a) the scope of this report, (b) the previous review of relief requests(1), and (c) the history of Prairie Island Nuclear Generating Plant, Units 1 and 2 since the earlier review.

The current revision to 10 CFR 50.55a requires that Inservice Inspection (ISI) programs be updated each 120 months to meet the requirements of newer editions of Section XI. Specifically, each program is to meet the requirements (to the extent practical) of the edition and addenda of the Code incorporated in the regulation by reference in paragraph (b) 12 months prior to the start of the current 120-month interval.

The regulation recognizes that the requirements of the later editions and addenda of the Code might not be practical to implement at facilities because of limitations of design, geometry, and materials of construction of components and systems. It, therefore, permits exceptions to impractical examination or testing requirements to be evaluated. Relief from these requirements can be granted, provided the health and safety of the public are not endangered, giving due consideration to the burden placed on the licensee if the requirements

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*Hereinafter referred to as Section XI or Code.

were imposed. This report only evaluates requests for relief dealing with inservice examinations of components and with system pressure tests. Inservice test programs for pumps and valves (IST programs) are being evaluated separately.

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 the Nuclear Regulatory Commission (NRC) or are only acceptable with restrictions. As appropriate, these instances are also discussed in this report.

In its previous Safety Evaluation Report dated November 14, 1980[1], NRC evaluated relief requests for Prairie Island Nuclear Generating Plant, Units 1 and 2, covering the first 120-month interval. The previous evaluation was based on submittals from the licensee dated October 15, 1976, for Unit 1[2] and October 12, 1977, for Unit 2[3]. An additional evaluation of a relief request related to pump casing welds was transmitted to the licensee on October 12, 1983[4]. On December 22, 1983, NPS submitted a new ISI program for the second 120-month interval which superseded all previous transmittals[5]. The relief requests contained in the December 22, 1983, submittal were based upon the 1980 Edition of Section XI of the Code, with addenda through Winter 1981. The Code edition and inspection intervals were in accordance with the revision of 10 CFR 50.55a applicable at the time.

Additional information was required to evaluate the revised NSP ISI plan, and a request for additional information was submitted to the licensee[6]. The licensee responded to the request by submitting additional information, withdrawing Relief Request No. 67 and providing revisions to some relief requests[7]. The relief requests contained in Reference 5, along with revisions contained in Reference 7, are evaluated in this report. All the relief requests are identical for both units except for Relief Request No. 50. Accordingly, all of the following evaluations apply to both units except for Relief Request No. 50, which is evaluated separately for each unit.

I. CLASS 1 COMPONENTS

A. Reactor Vessel

1. Relief Request No. 54, Reactor Vessel Support Lugs, Category B-H, Item B8.10

Code Requirement

Integrally welded attachments to the reactor vessel must be examined by volumetric or surface methods, as applicable, in accordance with IWB-2500-13, 14, and 15. Examination is limited to attachment welds joining the attachment to the pressure retaining membrane of the components and where the attachment base material design thickness is 5/8 inch or greater. Weld buildup on nozzles that serve as supports is excluded. The examination includes essentially 100% of the length of the weld to vessel and the integral attachment weld to a cast or forged integral attachment to the vessel, as applicable. One-hundred percent of the welding of each lug on the vessel is included in the examination. Deferral of the examination to the end of the interval is not permitted.

Code Relief Request

Relief is requested to defer inspection until near the end of the 10-year inspection period.

Proposed Alternative Examination

When the core barrel is removed from the reactor vessel, at or near the end of the inspection interval, the supports will be inspected 100%.

Licensee's Basis for Requesting Relief

As the result of the reactor vessel design, the two integrally welded supports are not accessible from the OD of the vessel. Ultrasonic examination through the vessel wall from the ID surface appears to be the only means of examination. This examination would require the core barrel to be removed to gain access to the vessel's ID surface.

Evaluation

The two integrally welded supports are not accessible for examination from outside the reactor vessel and are only accessible for examination from inside the reactor vessel when the core barrel is removed. Considering the cost, radiation exposure, and potential plant downtime, it is not practical to remove the core barrel to

implement inspection of the support lugs. The core barrel will be removed at or near the end of the inspection interval and the licensee has committed to examine the support lugs at that time. Since there is no published history of reactor vessel support lug failure for this or any other vessel design, deferral of the vessel support lug examination to the end of the interval should have no significant impact on plant safety.

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 will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted for deferral of inspection of the reactor vessel support lugs to the end of the interval when the core barrel is removed.

References

References 5 and 1.

B. Pressurizer

1. Relief Request No. 66, Nozzle Inner Radii, Category B-D, Item B3.120

Code Requirement

The nozzle-inside-radius section of Category B-D nozzles in the pressurizer must be examined volumetrically in accordance with IWB-2500-7(a)-(d) during each inspection interval. Category B-D nozzles include nozzles with full penetration welds to the vessel shell (or head) and integrally cast nozzles, but exclude manways and handholes either welded to or integrally cast in the vessel. If the examinations are conducted from inside the component and the nozzle weld is examined by the straight-beam ultrasonic method from the nozzle bore, the remaining examinations required to be conducted from the shell may be performed at or near the end of each inspection interval.

Code Relief Request

Relief is requested from the volumetric examination requirements of the nozzle inner radii.

Proposed Alternative Examination

The pressurizer spray nozzle may be susceptible to a thermal fatigue mechanism due to the potential for high cyclic temperature gradients; therefore, an attempt will be made to ultrasonically examine these inner radius areas. If service defects are detected by these examinations, the relief, surge, and safety nozzles shall be assessed for similar examinations. Meanwhile, if a more comprehensive technique is developed and qualified, it will be implemented.

Licensee's Basis for Requesting Relief

The Code required volume will not be examined, based on the following criteria:

(a) The pressurizer relief, surge, and safety nozzles do not experience high cyclic temperature gradients during normal operation, therefore, the conditions for producing a thermal fatigue mechanism are not applicable.

(b) Presently, there is no comprehensive inspection technique available, nor guidance for such in the ASME Code, which would provide a conclusive assessment of the Code required volumes of the inner radii, particularly since no preservice results are available for comparison.

(c) Upon consideration of the above factors, a best effort examination approach to these nozzle inner radius sections is not consistent with standard ALARA practices. An estimated 8 to 10 man-rem exposure rate over the interval, per unit, at the present radiation levels, would be experienced in attempting to perform such inconclusive examinations.

Evaluation

As the licensee has stated, currently available equipment and procedures for examination of nozzle inner radius sections are limited and generally applied on a best-effort basis. The inner radius sections most prone to cracking are those subjected to severe thermal cycling, and it is appropriate to emphasize inspection of these areas. Accordingly, the licensee has proposed a reasonable program for examination of nozzle inner radius sections on the pressurizer by implementing examination of the pressurizer spray nozzle which is subjected to thermal cycling. The remaining nozzles will be examined if indications are found in the spray nozzles. In addition, the licensee has agreed to broaden the scope of the inspections to include the other pressurizer nozzles if suitable examination techniques become available.

Conclusions and Recommendations

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

Relief should be granted from complete volumetric examination of pressurizer nozzle inner radii in accordance with IWB-2500-7, provided that:

(a) Best effort volumetric examinations of the pressurizer spray nozzle inner radii are conducted.

(b) The remaining pressurizer nozzles are examined if indications are detected in the spray nozzle.

References

References 5, 1, 6, and 7.

C. Heat Exchangers and Steam Generators

1. Relief Request No. 45, Pressure Retaining Welds in Other Than Reactor Vessels, Category B-B, Items B2.51 and B2.60

Code Requirement

Vessels 2 inches thick and over shall be examined in accordance with Article 4 of Section V as amended in IWA-2232.

Code Relief Request

Relief is requested to use the ultrasonic inspection procedure for pipe welds instead of the heavy wall vessel examination procedure for thin wall vessels. Specifically, relief is requested to use the procedures in Appendix III of Section XI for examination of vessels fabricated from piping components rather than Article 4 of Section V.

Proposed Alternative Examination

The examination procedures will comply with Appendix III of the 1980 Edition through the Winter 1981 Addenda of ASME Section XI as they apply to ultrasonic examination of pipe welds.

Licensee's Basis for Requesting Relief

The design service requirements for the regenerative heat exchanger and excess letdown heat exchangers resulted in the relatively small and thin wall vessels which permitted them to be fabricated from piping components. Therefore, ultrasonic inspection procedures for pipe welds would be more applicable than procedures for examination of heavy wall vessels.

Evaluation

The licensee has proposed an alternate examination which is to ultrasonically examine the regenerative heat exchangers and excess letdown heat exchanger in accordance with Appendix III of the 1980 Edition through the Winter 1981 Addenda of ASME Section XI.

The NSP procedure for ultrasonic examination of pipe welds utilizes a minimum of 1-1/2 node metal path examination. The required scanning area is defined as "the greater of 3t or 3 inches" from the toe of the weld on each side, to the extent practical, precluding any geometric limitations.

The Code required volume (CRV) for thin-walled components, as determined by Section XI, "the weld +1/2t either side," will be more than covered by the NSP piping procedure.

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 will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted for use of the pipe weld inspection procedure based on Appendix III of Section XI, 1980 Edition, with addenda through Winter 1981, for examination of the vessel welds in the regenerative heat exchangers and the excess letdown heat exchanger.

References

References 5, 1, 6, and 7.

2. Relief Request No. 66, Steam Generator Primary Inlet and Outlet and Regenerative Heat Exchanger Nozzles, Category B-D, Items B3.140 and B3.160

Code Requirement

The nozzle-inside-radius section of Category B-D nozzles in the steam generator and regenerative heat exchanger must be examined volumetrically in accordance with IWB-2500-7 during each inspection interval. Category B-D nozzles include nozzles with full penetration welds to the vessel shell (or head) and integrally cast nozzles, but exclude manways and handholes either welded to or integrally cast in the vessel. If the examinations are conducted from inside the component and the nozzle weld is examined by the straight beam ultrasonic method from the nozzle bore, the remaining examinations required to be conducted from the shell may be performed at or near the end of each inspection interval.

Code Relief Request

Relief is requested from the volumetric examination requirements of the nozzle inner radii.

Proposed Alternative Examination

The steam generator feedwater nozzles and the pressurizer spray nozzle may be susceptible to a thermal fatigue mechanism due to the potential for high cyclic temperature gradients; therefore, an attempt will be made to ultrasonically examine these inner radius areas. If service defects are detected by these examinations, steam generator primary inlet and outlet nozzles and the regenerative heat exchanger nozzles shall be assessed for similar examinations. Meanwhile, if a more comprehensive technique is developed and qualified, it will be implemented.

Licensee's Basis for Requesting Relief

Relief from examining the Code required volume is requested, based upon the following criteria:

(a) The steam generator primary inlet and outlet and regenerative heat exchanger nozzles do not experience high cyclic temperature gradients during normal operation; therefore, the conditions for producing a thermal fatigue mechanism are not applicable.

(b) Presently, there is no comprehensive inspection technique available, nor guidance for such in the ASME Code, which would provide a conclusive assessment of the Code required volumes of the inner radii, particularly since no preservice results are available for comparison.

(c) Upon consideration of the above factors, a best effort examination approach to these nozzle inner radius sections is not consistent with standard ALARA practices. An estimated 8 to 10 man-rem exposure rate over the interval, per unit, at the present radiation levels would be experienced in attempting to perform such inconclusive examinations.

Evaluation

As the licensee has stated, currently available equipment and procedures for examination of nozzle inner radius sections are limited and generally applied on a best effort basis. The inner radius sections most prone to cracking are those subjected to severe themal cycling, and it is appropriate to emphasize inspection of these areas. Accordingly, the licensee has proposed a reasonable program for examination of nozzle inner radius sections on the steam generator and pressurizer. The remaining steam generator and regenerative heat exchanger nozzles will be examined if indications are found in inspected nozzles. In addition, the licensee has agreed to broaden the scope of the inspections to include the other nozzles if suitable examination techniques become available.

Conclusions and Recommendations

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

Relief should be granted from complete volumetric examination of steam generator primary inlet and outlet and regenerative heat exchanger nozzle inner radii in accordance with IWB-2500-7, provided that:

(a) best effort volumetric examinations of the steam generator feedwater and pressurizer spray nozzle inner radii are conducted

(b) the remaining steam generator primary inlet and outlet and regenerative heat exchanger nozzles are examined if indications are detected in the steam generator nozzle.

References

References 5, 1, 6, and 7.

D. Piping Pressure Boundary

1. Relief Request No. 50 (Unit 1 Only), Safety Injection Low-Head Piping Welds, Category B-J, Item B9.11

Code Requirement

For circumferential welds with nominal pipe size 4 inches and greater, surface plus volumetric examinations in accordance with IWB-2500-8 shall be performed during each inspection interval, and shall include the following:

(a) All terminal ends in each pipe or branch run connected to vessels.

(b) All terminal ends and joints in each pipe or branch run connected to other components where the stress levels exceed the following limits under loads associated with specific seismic events and operational conditions.

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

(2) cumulative usage factor U of 0.4 .

(c) All dissimilar metal welds between combinations of:

(1) carbon or low alloy steels to high alloy steels,

(2) carbon or low alloy steels to high nickel alloys, and

(3) high alloy steels to high nickel alloys.

(d) Additional piping welds so that the total equals 25% of the circumferential joints in the reactor coolant piping system. This total does not include welds excluded by IWB-1220. These additional welds may be located in one loop (one loop is currently defined for both PWR and BWR plants in the 1980 Edition).

Code Relief Request

Relief is requested from the examination requirements for circumferential pipe welds in the safety injection low-head piping.

Proposed Alternative Examination

None.

Licensee's Basis for Requesting Relief

The piping is imbedded in concrete.

Evaluation

Access to volumetrically and/or surface examine these welds is restricted by not having access to the outside surface due to concrete. Alternatively, the area surrounding the inaccessible welds should be visually examined for leakage after a 4-hour hold at the pressure test requirements.

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 specified below will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from complete volumetric examination of safety injection low-head piping welds in accordance with IWB-2500-8, provided that:

All welds identified above as being inaccessible shall be visually inspected for leakage by observing the general area after a 4-hour hold at the pressure test requirements as stated in IWB-5000.

References

References 5, 1, 6, and 7.

E. Pump Pressure Boundary

1. Relief Request No. 63, Reactor Coolant Pump Casing Welds, Category B-L-1; and Pump Casings, Category B-L-2, Items B12.10 and B12.20

Code Requirement

Essentially 100% of the weld length of all the pump casing welds in one pump in each group of pumps performing similar functions in the system must be volumetrically examined in accordance with IWB-2500-16 during each interval. A supplementary surface examination of the pump casing welds may be performed as required in IWB-3518.1(d). Visual examination (VT-3) of the internal surfaces in one pump in each group of pumps performing a similar function in the system is also to be implemented in each interval. The visual examination may be performed on the same pump selected for volumetric examination of the welds.

Code Relief Request

Relief is requested from volumetric examination of the casing welds and visual examination of the internal surfaces for the reactor coolant pump.

Proposed Alternative Examination

As an alternate to the B-L-1 and B-L-2 examinations, NSP will do the following:

(a) Visually inspect the exterior of the pump casing during the hydrostatic pressure tests required by IWB-5000.

(b) Perform a surface examination of the external surface of the welds to the extent practicable.

(c) If maintenance or operational problems are encountered which require the disassembly of the pump, the pump's interior surface will be visually inspected. The need for performance of a volumetric examination will also be evaluated at that time.

Licensee's Basis for Requesting Relief

The licensee provided the following reasons as justification for the requested relief:

1. The radiation exposure for inservice inspection would more than double due to the pump inspection alone. The ISI radiation exposure for 1980, 1981, and 1982 were 42.2, 43.9, and 40.8 man-rem. Radiation exposure at other plants for the pump inspection ranged from 35 to 100 man-rem. A plant recently completed an inspection on the

same model pump as that of Prairie Island, during which the exposure was 46 man-rem, 10 of which were received to obtain a second radiograph. The first radiograph was not acceptable.

2. Additional exposure is received by personnel from the movement of the upper internals. The upper internals need to be placed in the reactor to minimize exposure and airborne contamination when the cavity and reactor coolant system is drained for the pump casing inspection. The upper internals need to be removed again for core reload.

3. The visual and/or volumetric examination will require complete disassembly of the pump. The pump manufacturer (Westinghouse) does not require or recommend pump disassembly to perform normal maintenance and inspections. There has been limited experience for personnel doing this task. Therefore, significant damage or degradation of the pump may result.

4. The estimated cost for the disassembly, inspection and assembly is approximately $500,000. This cost does not include additional loss in revenue if the outage is extended due to the inspection.

5. A visual inspection was performed on one RCP in 1982 when disassembled for repairs. The internal surface was visually inspected using an underwater TV camera. The pump casing was not drained. The inspection did not reveal any problems. The visual inspection was completed to the requirements of ASME Code Section XI.

6. The reactor coolant pumps at Prairie Island have additional monitoring equipment not originally supplied with the pump. The instruments monitor the shaft vibration, frame vibration, thrust position, phase monitoring, and locked rotor. It was this instrumentation which alerted the plant personnel to the 21 RCP problem in 1981.

7. The reactor coolant pump casing consists of two cast rings made from Type 316 stainless steel. This type of material is widely used in the nuclear industry and has performed well.

8. EPRI is conducting a study of inspection frequencies for the inservice inspection program. A portion of that study is directed at the reactor coolant pumps. The preliminary findings indicate the interval for reactor coolant pumps casing weld inspection could be increased without significant risk. EPRI will be issuing shortly a report on Research Project 2057. The report will discuss the reactor coolant pump casing weld inspection program. This report is titled "EPRI Report on Long-Term Inspection Requirements for Nuclear Power Plants Components."

Evaluation

The reactor coolant pumps at Prairie Island Units 1 and 2 are fabricated from two cast, Type 316 stainless steel rings joined together by one circumferential weld. The weld and internal surfaces of the pump are required to be volumetrically and visually examined, respectively. Volumetric examination of the weld by radiography and visual examination of the internal surfaces requires complete disassembly of the pump. The disassembly, examination preparation, and reassembly of the pump would cause maintenance and examination personnel to be exposed to high levels of radiation for extended periods of time. Volumetric examination of the casing weld by ultrasonic would produce unacceptable results because of the high ultrasound attenuation characteristics of cast material.

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 will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from volumetric examination of the pump casing welds and visual examination of the pump casing internal surfaces, provided that:

(a) The pump casing exterior is visually inspected during the hydrostatic test of the primary coolant system in accordance with IWB-5000.

(b) The pump casing welds and heat affected zone are subjected to a surface examination over 100% of the weld length.

(c) The pump interior surfaces are examined if the pump is disassembled for maintenance.

References

References 5, 1, and 4.

F. Valve Pressure Boundary

No relief requests.

G. General

1. Relief Request No. 52, Support Components, Categories F-A, F-B, F-C

Code Requirement

Plate and shell type supports (F-A), linear type supports (F-B), and component standard supports (F-C) shall be visually examined in accordance with IWF-1300-1 each inspection interval.

Code Relief Request

Insulation will not be removed for complete examination of all supports.

Proposed Alternative Examination

The insulation will be removed from a support component for further inspection whenever the connections and welds cannot be examined, or an abnormality is detected that may have been a result of a loss of support capability or inadequate restraint.

Licensee's Basis for Requesting Relief

Any loss of support capability or inadequate restraints can usually be detected through the inspection of the uninsulated portion of the support and the surrounding insulation. The governing codes and regulations used in the design and construction of those systems that are now classified as Class 2 and 3 did not require provisions for inspection access for these systems.

Thus, it would be an undue burden without compensating increase in safety to require insulation removal for support inspection.

Evaluation

The examination of supports to be conducted if relief is granted, will include all welds and mechanical connections for the required supports. Insulation will not be removed to examine support components which do not contain welds or mechanical connections. The insulation will be removed from a supported component for further inspections whenever an abnormality is detected that may have been a result of a loss of support capability or inadequate restraint. This approach should assure an adequate examination of support components.

Conclusions and Recommendations

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

Relief should be granted from complete visual examination of the Class 1 supports in accordance with IWF-1300-1, provided that:

The insulation must be removed sufficient to allow inspection of all mechanical connections, such as eyelets, bolts, adjustments, and locking devices. Any welds which might be on the support also require insulation removal to allow direct visual inspection of the weld.

References

References 5 and 1.

II. CLASS 2 COMPONENTS

A. Pressure Vessels

1. Relief Request No. 45, RHR Heat Exchangers, Category C-A, Item C1.10

This request for relief is essentially the same as previously discussed in Section I.C.1. Accordingly, based on the previous evaluation, it is concluded that for the welds discussed above, the Code requirements are impractical. It is further concluded that the alternative examination discussed previously will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted for use of the pipe weld inspection procedure based on Appendix III of Section XI, 1980 Edition, with addenda through Winter 1981, for examination of the vessel welds in the regenerative heat exchangers and the excess letdown heat exchangers.

References

References 5, 1, 6, and 7.

2. Relief Request No. 66, Main Steam and Accumulator Nozzles, Category C-B, Item C2.22

This request for relief is essentially the same as previously discussed in Section I.B.1 and I.C.2. Accordingly, based on the previous evaluation, it is concluded that for the areas discussed above, the Code requirements are impractical. It is further concluded that the alternative examination discussed previously will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from complete volumetric examination of main steam and accumulator nozzle inner radii in accordance with IWB-2500-7, provided that:

The nozzles for which relief is granted are examined if indications are found during examination of the pressurizer spray nozzles or the steam generator feedwater nozzles.

References

References 5, 1, 6, and 7.

B. Piping

1. Relief Request No. 50 (Unit 1 Only), Piping and Supports, Categories C-F and C-C, Items C5.11, C5.21, and C3.20

Code Requirement

For circumferential welds with nominal wall thickness greater than 1/2 inch (C5.21), surface plus volumetric examinations in accordance with IWC-2500-7 shall be performed during each inspection interval for 100% of each weld. For circumferential welds with a nominal wall thickness less than or equal to 1/2 inch, only surface examination is required (C5.11). The examinations under both items shall include:

(a) all welds at locations where the stresses under the loadings resulting from Normal and Upset plant conditions as calculated by the sum of Eqs. (9) and (10) in NC-3652 exceed 0.8 (1.2 S_n + S_A);

(b) all welds at terminal ends (see (e) below) of piping or branch runs;

(c) all dissimilar metal welds;

(d) additional welds, at structural discontinuities (see (f) below) such that the total number of welds selected for examination includes the following percentages of circumferential piping welds:

(1) none of the welds exempted by IWC-1220,
(2) none of the welds in residual heat removal and emergency core cooling systems,
(3) 10% of the main steam system welds 8-inch nominal pipe size and smaller,
(4) 25% of the welds in all other systems.

(e) terminal ends are the extremities of piping runs that connect to structures, components (such as vessels, pumps, valves), or pipe anchors, each of which act as rigid restraints or provide at least two degrees of restraint to piping thermal expansion;

(f) structural discontinuities include pipe weld joints to vessel nozzles, valve bodies, pump casings, pipe fittings (such as elbows, tees, reducers, flanges, etc. conforming to ANSI B16.9), and pipe branch connections and fittings;

(g) examination requirements are under development.

The welds initially selected for examination shall be re-examined over the service lifetime of the piping component. For welds in carbon or low alloy steels, only those welds showing reportable preservice transverse indications need to be examined for transverse reflectors.

For integrally welded attachments on components required to be examined under Category C-F or C-G and whose base material design thickness is 3/4 inch or greater, 100% of the weld length must be examined by surface methods in accordance with IWC-2500-5.

Code Relief Request

Relief from examination of the following components is requested.

System	Item	Identification
MAIN STEAM SYSTEM PIPING WELDS (ENCAPSULATED AT GUARD PIPE)		
31-MS-2	Welds	MS-160, 71, 72, 73, 74, 75, 76, 77, 78, 79
	Welds	MS-74 to 75, 76 to 77, 78 to 79
30-MS-2	Welds	MS-68, 70, 159, 108
	Welds	MS-159 to 160
6-MS-2	Welds	MS-108A, 134
31-MS-1	Welds	MS-14 to 15
30-MS-1	Welds	MS-51, 52W
	Welds	MS-182 to 183
6 MS-1	Welds	MS-51C, 62
MAIN STEAM SYSTEM SUPPORTS (ENCAPSULATED AT GUARD PIPE)		
31-MS-1	Supports	I
30-MS-1	Supports	J
31-MS-2	Supports	I, J, K
30-MS-2	Supports	E, F, G, L
FEEDWATER SYSTEM PIPING WELDS (ENCAPSULATED BY GUARD PIPE)		
16-FW-16	Welds	FW-202, 203, 204, 225, 205, 206, 207, 208, 209, 210, 211, 212, 219, 213, 214
FEEDWATER SYSTEM SUPPORTS (ENCAPSULATED AT GUARD PIPE)		
16-FW-16	Supports	L, LL, N, O, Q, R, S
CONTAINMENT SUMP B DISCHARGE PIPING WELDS (IMBEDDED IN CONCRETE)		
14-SI-33A	Welds	SI-11, 217, 12, 13
14-SI-34A	Welds	SI-14
14-SI-33B	Welds	SI-1, 217, 12, 13
14-SI-24B	Welds	SI-4
CONTAINMENT SUMP B DISCHARGE PIPING WELDS (IMBEDDED IN CONCRETE)		
14-SI-33A	Welds	SI-11, 217, 12, 13
14-SI-34A	Welds	SI-14
14-SI-33B	Welds	SI-4
14-SI-34B	Welds	SI-4

System	Item	Identification
CONTAINMENT SUMP B DISCHARGE SUPPORTS (IMBEDDED IN CONCRETE)		
14-SI-33A	Supports	A, B, C
14-SI-33B	Supports	A, B, C

Proposed Alternative Examination

None.

Licensee's Basis for Requesting Relief

The components specified are not accessible for examination.

Evaluation

Access to volumetrically and/or surface examine these welds is restricted by not having access to the outside surface due to the interference from steel plate or concrete. Alternatively, the area surrounding the inaccessible welds should be visually examined for leakage after a 4-hour hold at the pressure test requirements. In addition, the encapsulated supports should be visually examined (VT-3 and VT-4) in accordance with IWF-2500-1.

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 specified below will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from complete volumetric and surface examination of the specified welds in accordance with IWC-2500, provided that:

(a) All welds identifed above as being inaccessible shall be visually inspected for leakage by observing the general area after a 4-hour hold at the pressure test requirements stated in IWB-5000 and IWC-5000. This examination, and other volumetric inspections required by Section XI of similar systems which can be performed, will provide assurance that no degradation has occurred and the piping pressure boundary will remain structurally acceptable during the inspection interval.

(b) The encapsulated supports should be visually examined (VT-3 and VT-4) in accordance with IWF-2500-1.

References

References 5, 1, 6, and 7.

2. Relief Request No. 50 (Unit 2 Only), Piping and Supports, Categories C-F, C-C, F-A, F-B, and F-C, Items C5.11, C5.12, C5.21, C5.22, C5.31, and C3.20

Code Requirement

For circumferential welds with nominal wall thickness greater than 1/2 inch (C5.11), surface plus volumetric examinations in accordance with IWC-2500-7 shall be performed during each inspection interval for 100% of each weld. For circumferential welds with a nominal wall thickness less than or equal to 1/2 inch, only surface examination is required (C5.21). The examinations under both items shall include:

(a) all welds at locations where the stresses under the loadings resulting from Normal and Upset plant conditions as calculated by the sum of Eqs. (9) and (10) in NC-3652 exceed 0.8 ($1.2\ S_n + S_A$);

(b) all welds at terminal ends (see (e) below) of piping or branch runs;

(c) all dissimilar metal welds;

(d) additional welds, at structural discontinuities (see (f) below) such that the total number of welds selected for examination includes the following percentages of circumferential piping welds:

(1) none of the welds exempted by IWC-1220,
(2) none of the welds in residual heat removal and emergency core cooling systems,
(3) 10% of the main steam system welds 8-inch nominal pipe size and smaller,
(4) 25% of the welds in all other systems.

(e) terminal ends are the extremities of piping runs that connect to structures, components (such as vessels, pumps, valves), or pipe anchors, each of which act as rigid restraints or provide at least two degrees of restraint to piping thermal expansion;

(f) structural discontinuities include pipe weld joints to vessel nozzles, valve bodies, pump casings, pipe fittings (such as elbows, tees, reducers, flanges, etc. conforming to ANSI B16.9), and pipe branch connections and fittings;

(g) examination requirements are under development.

For longitudinal welds in piping less than or equal to 1/2 inch nominal wall thickness (C5.12), a surface examination covering 2.5t at the intersecting weld shall be conducted in accordance with IWC-2500-7. For longitudinal welds in piping greater than 1/2 inch in nominal wall thickness (C5.22), both a surface and volumetric examination covering 2.5t at the intersecting circumferential weld shall be conducted in accordance with IWC-2500-7.

For circumferential branch connection welds in piping greater than 4 inches nominal (C5.31), surface examinations covering 100% of each weld shall be conducted in accordance with IWC-2500-9 to -13, inclusive.

The welds initially selected for examination shall be re-examined over the service lifetime of the piping components. For welds in carbon or low alloy steels, only those welds showing reportable preservice transverse indications need to be examined for transverse reflectors.

For integrally welded attachments on components required to be examined under Categories C-F, C-G, C-C, F-A, F-B, and F-C and whose base material design thickness is 3/4-inch or greater (C3.20), 100% of the weld length must be examined by surface methods in accordance with IWC-2500-5.

Plate and shell type supports (F-A), linear type supports (F-B), and component standard supports (F-C) shall be visually examined in accordance with IWF-1300-1 each inspection interval.

Code Relief Request

Relief from examination of the following components is requested.

System	Item	Identification
MAIN STEAM SYSTEM PIPING WELDS (ENCAPSULATED BY GUARD PIPE)		
31-2MS-1	Welds	MS-19, MS-20
	Welds	MS-19 to MS-20
30-2MS-1	Weld	MS-22
	Welds	MS-185B, MS-185D
6-2MS-1	Weld	MS-33
	Welds	MS-166, 92, 93, 94, 95, 96, 97, 98, 99, 117, 170
	Welds	MS-165 to MS-166, MS-95 to MS-96 MS-97 to MS-98, MS-99 to MS-117
	Weld	MS-98B
30-2MS-2	Welds	MS-88, 89, 90, 91, 165, 100
	Welds	MS-89 to MS-90
	Welds	MS-183C, MS-183A
6-2MS-2	Weld	MS-11
MAIN STEAM SYSTEM PIPING SUPPORTS (ENCAPSULATED BY GUARD PIPING)		
30-2MS-1	Support	O
30-2MS-2	Supports	D, E, F, G, H
31-2MS-1	Supports	L, M, N
31-2MS-2	Supports	I, K, L, M, Q
FEEDWATER SYSTEM PIPING WELDS (ENCAPSULATED BY GUARD PIPE)		
16-2FW-16	Welds	FW-119, 120, 121, 122, 123, 124, 125, 126, 127, 185, 128, 129, 130W, 131, 132

System	Item	Identification
FEEDWATER SYSTEM PIPING SUPPORTS (ENCAPSULATED BY GUARD PIPE)		
16-2FW-16	Supports	A, B, C, D, E, F, G, H
CONTAINMENT SUMP A & B DISCHARGE PIPING WELDS (IMBEDDED IN CONCRETE)		
14-2SI-33B	Welds	1, 2, 3, 207
14-2SI-34B	Weld	4
14-2SI-33A	Welds	13, 14, 15
14-2SI-34A	Weld	16
CONTAINMENT SUMP A & B DISCHARGE (IMBEDDED IN CONCRETE)		
14-2SI-33B	Supports	A, B, C
14-2SI-33A	Supports	A, B, C

Proposed Alternative Examination

None.

Licensee's Basis for Requesting Relief

The components specified are not accessible for examination.

Evaluation

Access to volumetrically and/or surface examine these welds is restricted by not having access to the outside surface due to the interference from steel plate or concrete. Alternatively, the area surrounding the inaccessible welds should be visually examined for leakage after a 4-hour hold at the pressure test requirements. In addition, the encapsulated supports should be visually examined (VT-3 and VT-4) in accordance with IWF-2500-1.

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 specified below will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from complete volumetric and surface examination of the specified welds in accordance with IWC-2500, provided that:

(a) All welds identified above as being inaccessible shall be visually inspected for leakage by observing the general area after a 4-hour hold at the pressure test requirements stated in IWB-5000 and IWC-5000. This examination, and other volumetric inspections required by Section XI of similar systems which can be performed, will provide assurance that no degradation has occurred and the piping pressure boundary will remain structurally acceptable during the inspection interval.

(b) The encapsulated supports are visually examined (VT-3 and VT-4) in accordance with IWF-2500-1.

References

References 5, 1, 6, and 7.

C. Pumps

No relief requests.

D. Valves

No relief Requests.

E. General

1. Relief Request No. 52, Support Components, Categories F-A, F-B, and F-C

This request for relief is the same as the request discussed in Section I.G.1. Accordingly, based on the previous evaluation, it is concluded that for the supports discussed, the Code requirements are impractical. It is further concluded that the alternative examination discussed previously will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from complete visual examination of the Class 2 supports in accordance with IWF-1300-1, provided that:

The insulation is removed sufficient to allow inspection of all mechanical connections, such as eyelets, bolts, adjustments, and locking devices. Any welds which might be on the support also require insulation removal to allow direct visual inspection of the weld.

References

References 5 and 1.

III. CLASS 3 COMPONENTS

No relief requests.

IV. PRESSURE TESTS

A. General

No relief requests.

B. Class 1 System Pressure Tests

1. Relief Request No. 60, Class 1 Piping Between 31329 and VC-8-3, Category B-P, Items B15.50 and B15.51

Code Requirement

A system leakage test in accordance with IWB-5221 shall be conducted prior to startup following each refueling outage, and a system hydrostatic test shall be conducted at or near the end of each interval in accordance with IWB-5222.

Code Relief Request

Relief from pressure testing this section of piping is requested.

Proposed Alternative Examination

The section of piping will be given a surface examination each inspection interval.

Licensee's Basis for Requesting Relief

This section of piping is not isolatable from the RCS. Performing a leakage test at functional pressure causes pressurizer spray which causes a reduction in RCS pressure. Spraying water into the pressurizer from the auxiliary spray line is an abnormal operation. The spray line is designated for 10 such inadvertent operations.

Evaluation

Because of the design of the Auxiliary Spray System, piping between the motor-operated valve #31329 and check valve #VC-8-3 cannot be pressurized to the proper test pressure without bypassing the check valve or opening the motor-operated valve. It is impractical to pressurize this portion of the piping system at the frequency required by the Code because of the risk associated with the inadvertent operation of the pressurizer sprays. This section of piping is also examined by surface methods in accordance with the rules of IWB-2000.

Conclusions and Recommendations

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

Relief should be granted from pressure testing the spray system piping in accordance with IWB-5221 and -5222 provided that:

Surface examination of 100% of the piping welds is conducted in accordance with IWB-2000.

References

References 5 and 1.

C. Class 2 System Pressure Tests

1. Relief Request No. 29, Class 2 Piping, Category C-H, Items C7.10 and C7.20

Code Requirement

A system leakage test in accordance with IWC-5221 shall be conducted each period, and a system hydrostatic test in accordance with IWC-5222 shall be conducted at or near the end of each interval.

Code Relief Request

Relief is requested from testing the following piping at the pressures required by IWC-5000.

Components:

Safety Injection Piping unisolatable from Class 1 Piping (NF-39813)

Reactor Coolant System Piping 3/4" and smaller that is unisolatable from Class 1 Piping (NF-39807)

Residual Heat Removal System Piping unisolatable from Class 1 Piping (NF-39813)

RCP Seal Injection Piping 3/4" and smaller that is unisolatable from Class 1 piping (NF-39809)

RCP Seal Return Piping unisolatable from Class 1 (NF-39809)

Charging Line Piping unisolatable from Class 1 (NF-39809)

Sample System Piping unisolatable from Class 1 (NF-39807)

Proposed Alternative Examination

The piping will be tested to the Class 1 requirements, i.e.:

1. The unisolated portions of the Class 1 piping will be visually examined for evidence of leakage at the system nominal operating pressure in accordance with the requirement of IWB-5221. This inspection will be performed prior to startup following each reactor refueling outage.

2. The unisolated portions of the Class 2 piping will be hydrostatically tested when the Class 1 piping is tested.

Licensee's Basis for Requesting Relief

The piping is not isolatable from the Class 1 piping.

Evaluation

The Class 2 piping specified cannot be isolated from Class 1 piping for pressure testing. The licensee proposes to pressure test the Class 2 piping at the same time the Class 1 piping is pressure tested. Depending on the design temperature of the Class 2 piping, this would result in slightly reduced test pressures; however, the pressure test should still be adequate to confirm the structural integrity of the system.

Conclusions and Recommendations

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

Relief should be granted from pressure testing the specified Class 2 piping in accordance with IWC-5000, provided that:

(a) The specified piping is pressure tested in accordance with the requirements of IWB-5000.

(b) The licensee performs a visual examination for evidence of leakage on those portions of the above systems at the system nominal operating pressure in accordance with the requirements of IWB-5221. This examination shall be performed prior to startup following each reactor refueling outage.

References

References 5 and 1.

2. Relief Request No. 68, Steam Generator Secondary Side, Category C-H, Item C7.20

Code Requirement

A system hydrostatic test shall be conducted at or near the end of each interval in accordance with IWC-5222.

Code Relief Request

Relief is requested from using the 10-year hydrostatic test pressure as specified by IWC-5000.

Proposed Alternative Examination

The steam generator will be tested in accordance with IWB-5000 requirements.

Licensee's Basis for Requesting Relief

For the following reasons, the steam generator secondary sides, main steam line to the main steam isolation valves, the feedwater line inlets to the steam generators, the auxiliary feedwater inlet to the steam generators, and the steam generator blowdown lines from the steam generators (to the first isolation) are to be hydro-tested in accordance with Article IWB-5000 of the ASME Boiler and Pressure Vessel Code:

1. The maximum allowable secondary to primary pressure differential is 670 psig at 650°F. To avoid violation of the design differential, the Reactor Coolant System pressure would have to be elevated above 677 psig and to an over-pressure condition.

2. The main steam safety valves would not require gagging, thereby precluding any chance of overpressurizing the steam generator.

3. Since the steam generator is integrally tied to the Reactor Coolant System, it is logical as well as practical to test them at hot shutdown per IWB-5000 of the Code. This allows a hot hydro in lieu of cold hydro.

Evaluation

Hydrostatic testing of the steam generator secondary side and related piping would be done at 1.25 times the system pressure if implemented in accordance with IWC-5222. Pressurization of the secondary to this level would result in a differential pressure

between the primary and secondary side that was the reverse of normal operation and in excess of the maximum allowable differential by at least 7 psig. Excessive reverse pressure differential in the steam generator tubes is not a desirable system test. Hydrostatic testing of the secondary system in conjunction with the primary system hydrostatic tests as proposed by the licensee is an acceptable alternate test provided that the visual examinations required by IWC-5222 are conducted.

Conclusions and Recommendations

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

Relief should be granted from hydrostatic testing of the steam generator secondary piping in accordance with IWC-5222, provided that:

(a) The specified piping is hydrostatically tested in accordance with IWB-5000.

(b) The visual examinations required by IWC-5222 are conducted.

References

References 5 and 1.

D. Class 3 System Pressure Tests

1. Relief Request No. 28, Cooling Water Supply and Return Headers, Category D-A, Item D1.10

Code Requirement

A system hydrostatic test in accordance with IWD-5223 shall be conducted at or near the end of each interval.

Code Relief Request

Relief is requested from hydrotesting the piping each inspection interval as required by IWD-2410.

Proposed Alternative Examination

The Cooling Water System will be visually examined by every one-third of each inspection interval for conditions adverse to system operation. Additionally, the system is in constant operation and any leaks would be immediately known. Portions that are isolatable from the main headers will be pressure tested in accordance with the applicable requirements.

Licensee's Basis for Requesting Relief

The Cooling Water System design is such that Unit 1 and Unit 2 safeguards equipment is supplied from both sides of the cooling water system header. Consequently, the entire supply and return header must be in operation at all times to meet operating license requirements.

Evaluation

The cooling water system is in continuous operation, serving both units in order to meet licensing requirements. The main headers cannot be isolated from the system for pressure testing. Alternatively, the licensee has proposed that normal operational surveillance of the system would detect any leaks that developed. The isolatable portions of the Cooling Water System will be hydrostatically tested as required by the Code.

Conclusions and Recommendations

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

Relief should be granted from hydrostatic testing of the cooling water supply headers in accordance with IWD-5000, provided that:

(a) Operational surveillance of the system is maintained such that leaks will be detected.

(b) The headers are visually examined each one-third interval for conditions adverse to system operation.

References

References 5 and 1.

2. Relief Request No. 30, Diesel Generator Air and Cooling Water Piping, Category D-A, Item D1.10

Code Requirement

A system hydrostatic test in accordance with IWD-5223 shall be conducted at or near the end of each interval.

Code Relief Request

Relief is requested from hydrotesting portions of the Class 3 piping each inspection interval as required by IWD-2410. The Starting Air, Air Intake, and Cooling Water Piping associated with 11 and 12 diesel generator (NF-39822) are the specific systems affected.

Proposed Alternative Examination

The piping will be visually examined by every one-third of each inspection interval for conditions adverse to system operation. Additionally, the systems are in constant operation and any leaks would be immediately known. Portions that are isolatable from the diesel generators will be pressure tested in accordance with the applicable requirements.

Licensee's Basis for Requesting Relief

The piping is not isolatable from the diesel generators.

Evaluation

The diesel generator starting air, air intake, and cooling water piping cannot be isolated for hydrostatic testing. The licensee has proposed to visually examine the piping every one-third of each inspection interval for conditions adverse to system operation. Additionally, the systems are in constant operation and any leaks would be known. Portions that are isolatable from the diesel generators will be pressure tested in accordance with the applicable requirements.

Conclusions and Recommendations

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

Relief should be granted from hydrostatic testing of the specified piping in accordance with IWD-2410, provided that:

(a) Operational surveillance is maintained such that leaks will be detected.

(b) The piping is visually examined each one-third interval for conditions adverse to system operation.

References

References 5 and 1.

3. Relief Request No. 31, Diesel Cooling Water and Fuel Piping, Category D-A, Item D1.10

Code Requirement

A system hydrostatic test in accordance with IWD-5223 shall be conducted at or near the end of each interval.

Code Relief Request

Relief is requested from inspecting the fuel oil piping (visual examination or pressure test) as required by IWD-2410 (IWD-5223).

Proposed Alternative Examination

None.

Licensee's Basis for Requesting Relief

The tanks and most of the piping are underground and not accessible for testing and inspection. Any leakage from the fuel oil storage tanks will be detected during daily checks of the storage tanks levels. Also, each tank is annually tested for moisture content to further verify its integrity. Monthly checks of the diesel generator and diesel cooling water pump day tank levels and day tank alarms will indicate any problems in the fuel oil transfer piping system.

Evaluation

The fuel oil storage tanks and most piping are underground and therefore inaccessible for examination. Operational surveillance by the licensee on a daily, monthly, and yearly basis should provide adequate monitoring of the fuel systems.

Conclusions and Recommendations

Based on the above evaluation, it is concluded that for the fuel tanks and piping discussed above, the Code requirements are impractical. It is further concluded that the operational monitoring discussed will provide the necessary added assurance of structural reliability. Therefore, the following is recommended:

Relief should be granted from hydrostatic testing of diesel fuel tanks and piping in accordance with IWD-5223.

References

References 5 and 1.

V. GENERAL

1. Relief Request No. 48, UT Procedures for Bolts and Studs

Code Requirement

Ultrasonic examinations shall be performed in accordance with Article 5 of Section V when the provisions of Appendix III of Section XI do not apply.

Code Relief Request

Relief is requested to use the back reflection method for examination of bolts and studs for the reactor coolant pump flange bolting.

Proposed Alternative Examination

The items will be examined using the back reflection method correlated with an as-built sketch of the particular bolt or stud being examined. ASME Section XI will be used for evaluation criteria.

Licensee's Basis for Requesting Relief

The Section V technique utilizing the calibration test bar was not used for the baseline examinations and is not as sensitive to detect discontinuities as the presently applied back reflection method.

A qualification program was initiated by NSP and documented in the PI-ISI submittal for the first 10-year inspection interval. During the qualification test, it was demonstrated that the NSP-UT-4 procedure, which utilizes a back reflection technique for flaw evaluation, was a more sensitive examination than the technique specified in ASME Section V, Article 5, paragraph T-525.2 .

The results indicated that at the same nominal metal path, the NSP procedure was approximately 6db more sensitive than the ASME technique. In addition to the percent-of-DAC reporting level, the NSP procedure dictates that any reflector, regardless of amplitude, which is accompanied by a 50% loss of back wall reflection must be reported/evaluated. As poorer end reflecting surfaces are encountered, the NSP procedure tends to become a much more conservative approach to bolt and stud examination.

Evaluation

The licensee has developed, implemented, and documented a back reflection UT method for examination of reactor coolant pump flange bolts and studs. The method was successfully used during the first ISI interval. The method appears to be suitable and its continued use provides for comparison with previous inspections.

Conclusions and Recommendations

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

Relief should be granted provided that use of the NSP-UT-4 back reflection method for examination of reactor coolant pump studs and bolts is verified by the resident inspector.

References

References 5, 1, 6, and 7.

2. Relief Request No. 56, UT Calibration Blocks

Code Requirement

When using Appendix III of ASME Section XI, Winter 1982 Addenda, the basic calibration blocks shall be made from material of the same nominal diameter as those to be examined.

Code Relief Request

The licensee requests relief to use flat calibration blocks for pipes greater than 20-inches in diameter.

Proposed Alternative Examination

For surface curvature, the rules of Article 5 of Section V, 1980 Edition through Winter 1981 Addenda, will apply for examination of pipe welds and welds in components fabricated from piping. In addition, the other requirements of Appendix III basic calibration blocks will be met.

Licensee's Basis for Requesting Relief

A flat basic calibration block gives the same results as a block essentially the same curvature for components greater than 20-inches in diameter. Any difference in accuracy and sensitivity for ultrasonic examination when using a flat basic calibration block versus a curved-basic calibration block for components greater than 20 inches in diameter is within the accuracy of the test. NSP believes that compliance with Appendix III requirements for basic calibration block curvature would be an undue burden with no increase in public safety.

Evaluation

The rules provided in Section V for surface curvature are acceptable for examination of piping greater than 20 inches in diameter.

Conclusions and Recommendations

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

Relief should be granted to use Section V, Article 5 of the 1980 Edition, through Winter 1981 Addenda for curvature of calibration blocks.

References

References 5 and 1.

REFERENCES

1. R. A. Clark (NRC) to L. O. Mayer (NSP), Safety Evaluation Report by the Office of Nuclear Reactor Regulation Related to Amendment No. 43 to Facility Operating License No. DPR-42 and Amendment No. 37 to Facility Operating License No. DPR-60, Northern States Power Company, Prairie Island Nuclear Generating Plant, Unit No's. 1 and 2, Docket No's. 50-582 and 50-306, November 14, 1980.

2. Transmittal letter (NSP) to (NRC), Inservice Inspection Technical Specifications, Unit No. 1, October 15, 1976.

3. Transmittal letter (NSP) to (NRC), Inservice Inspection Technical Specifications, Unit No. 2, October 12, 1977.

4. J. R. Miller (NRC) to D. M. Musolf (NSP), Relief Request from the Inservice Inspection of Reactor Coolant Pump Casing Welds - Prairie Island Nuclear Generating Plant Units 1 and 2, October 12, 1983.

5. D. M. Musolf (NSP) to Director (NRR), Submittal of the 2nd 10-Year Inservice Inspection and Testing (ISI/IST) Program, Prairie Nuclear Generating Plant, December 22, 1983.

6. Request for Additional Information, March 23, 1984.

7. D. M. Musolf (NSP) to Director (NRR), Response to NRC Request for Supplemental Information on the Second Ten-Year ISI Program Request for Relief, June 11, 1984.

NA-1&2, the expansion of the spent fuel storage capacity to accommodate both NA-1&2 and 500 Surry spent fuel assemblies will not create any significant additional radiological effects. The additional total body dose that might be received by an individual at the site boundary and the estimated dose to the total body of the population within a 50-mile radius of the plant is less than 0.1 mrem per year and 0.1 person-rem per year, respectively. These doses are extremely small compared to the fluctuations in the annual dose this population receives from background radiation. This population dose represents an increase of less than 1 percent of the dose previously evaluated in the FES for NA-1&2. The occupational radiation dose to the work force engaged in the modification of the spent fuel storage racks (including present rack disposal) and the loading/unloading of 500 Surry spent fuel assemblies is estimated by the licensee to be 31 person-rem. This is a small fraction of the total person-rems from occupational dose at NA-1&2. The small increase in radiation dose should not affect the licensee's ability to maintain individual occupational dose within the limits of 10 CFR Part 20, and as low as reasonably achievable. Finally, pursuant to 10 CFR 51.52, the radiological impact to the environment related to the transshipment of 500 Surry spent fuel assemblies from Surry to NA-1&2 is well within the scope of Table S-4, and is therefore acceptable.

8.0 Basis and Conclusion for Not Preparing an Environmental Impact Statement

The staff has reviewed this proposed facility modification relative to the requirements set forth in 10 CFR Part 51 and the Council on Environmental Quality's Guidelines, 40 CFR 1500.6. Based on this assessment, we propose to find that the actions specified will not either separately or combined significantly impact on the quality of the human environment. These actions are: