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TECHNICAL EVALUATION REPORT

TECHNICAL EVALUATION REPORT ON THE THIRD
10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN:
NORTHEAST UTILITIES,
MILLSTONE NUCLEAR POWER STATION, UNIT 1,
DOCKET NUMBER 50-245

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ABSTRACT

This report presents the results of the evaluation of the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection (ISI) Program Plan*, submitted December 14, 1990, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the Licensee has determined to be impractical. The *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan* is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the Nuclear Regulatory Commission (NRC) review. The requests for relief are evaluated in Section 3 of this report.

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

SUMMARY

The Licensee, Northeast Utilities, has prepared the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection (ISI) Program Plan* to meet the requirements of the 1986 Edition of the ASME Code, Section XI, except that the extent of examination for Class 1, Examination Category B-J welds has been determined by the 1974 Edition through Summer 1975 Addenda, as permitted by 10 CFR 50.55a(b). The third 10-year interval began in May 1991 and ends in May 2001.

The information in the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan*, submitted December 14, 1990, was reviewed. Included in the review were the requests for relief from the ASME Code Section XI requirements that the Licensee has determined to be impractical. As a result of this review, a request for additional information was prepared describing information and/or clarifications required from the Licensee in order to complete the review. The Licensee provided the requested information in the submittal dated November 5, 1991.

Based on the review of the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan*, the Licensee's response to the Nuclear Regulatory Commission's RAI, and the recommendations for granting relief from the ISI examinations that cannot be performed to the extent required by Section XI of the ASME Code, it is recommended that the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan*, be considered unacceptable and not in compliance with 10 CFR 50.55a(g)(4), until the issues described in MEB 3-1 (see Section 2.2.4 of this report) are addressed. It is also recommended that Request for Relief Nos. B-A-1 (Rev. 1), B-G-1-1, B-G-2-1, C-C-1, and IWC-1 be denied.

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TECHNICAL EVALUATION REPORT ON THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN: NORTHEAST UTILITIES, MILLSTONE NUCLEAR POWER STATION, UNIT 1, DOCKET NUMBER 50-245

1. INTRODUCTION

Throughout the service life of a water-cooled nuclear power facility, 10 CFR 50.55a(g)(4) (Reference 1) requires that components (including supports) that are classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, Class 2, and Class 3 meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components" (Reference 2), to the extent practical within the limitations of design, geometry, and materials of construction of the components. This section of the regulations also requires that inservice examinations of components and system pressure tests conducted during the successive 120-month inspection interval comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the date of the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet requirements set forth in subsequent editions and addenda of this Code that are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein. The Licensee, Northeast Utilities, has prepared the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection (ISI) Program Plan* to meet the requirements of the 1986 Edition of the ASME Code Section XI, except that the extent of examination for Class 1, Examination Category B-J welds has been determined by the 1974 Edition through Summer 1975 Addenda as permitted by 10 CFR 50.55a(b). The third 10-year interval began in May 1991 and ends in May 2001.

As required by 10 CFR 50.55a(g)(5), if the licensee determines that certain Code examination requirements are impractical and requests relief from them, the licensee shall submit information and justifications to the Nuclear Regulatory Commission (NRC) to support that determination.

Pursuant to 10 CFR 50.55a(g)(6), the NRC will evaluate the licensee's determination that Code requirements are impractical to implement. The NRC may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Alternatively, pursuant to 10 CFR 50.55a(a)(3), the NRC will evaluate the Licensee's determination that either (i) the proposed alternatives provide an acceptable level of quality and safety or that (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety. Proposed alternatives may be used when authorized by the NRC.

The information in the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval ISI Program Plan* (Reference 3), submitted December 14, 1990, was reviewed, including the requests for relief from the ASME Code Section XI requirements that the Licensee has determined to be impractical. The review of the ISI Program Plan was performed using NUREG-0800 *Standard Review Plan* (Reference 4), Section 5.2.4, "Reactor Coolant Boundary Inservice Inspections and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components."

In a letter dated September 3, 1991 (Reference 5), the NRC requested additional information that was required in order to complete the review of the ISI Program Plan. The Licensee responded to the request for additional information (RAI) in a letter dated November 5, 1991 (Reference 6). In this response, the Licensee, Northeast Utilities, provided the requested information, withdrew 4 relief requests, and revised 9 relief requests.

As a result of telephone conversations with the Licensee on January 17, 1992, January 20, 1992, and February 25, 1992, the Licensee submitted additional information regarding the ISI Program Plan in a letter dated March 30, 1992 (Reference 7).

The *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval ISI Program Plan* is evaluated in Section 2 of this report. The ISI Program Plan

is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous reviews.

The requests for relief are evaluated in Section 3 of this report. Unless otherwise stated, references to the Code refer to the ASME Code, Section XI, 1986 Edition. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

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

2.1 Documents Evaluated

Review has been completed on the following information from the Licensee:

(a) *Millstone Nuclear Power Station, Unit 1, Third 10-Year ISI Interval Program Plan*, dated December 14, 1990.

(b) Letter, dated November 5, 1991 (Reference 6), containing the response to the NRC request for additional information.

(c) Letter, dated March 30, 1992 (Reference 7), containing a response to the NRC concerns discussed during conference calls with the Licensee.

2.2 Compliance with Code Requirements

2.2.1 Compliance with Applicable Code Editions

The Inservice Inspection Program Plan shall be based on the Code editions defined in 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(b). Based on the starting date of May 1991, the Code applicable to the third interval ISI program is the 1986 Edition. As stated in Section 1 of this report, the Licensee has prepared the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval ISI Program Plan* to meet the requirements of the 1986 Edition of the ASME Code, Section XI, except that the extent of examination for Class 1, Examination Category B-J welds has been determined by the 1974 Edition through Summer 1975 Addenda as permitted by 10 CFR 50.55a(b).

2.2.2 Acceptability of the Examination Sample

Inservice volumetric, surface, and visual examinations shall be performed on ASME Code Class 1, 2, and 3 components and their supports using sampling schedules described in Section XI of the ASME Code and 10 CFR 50.55a(b). Sample size and weld selection have been implemented in accordance with the Code and 10 CFR 50.55a(b) and appear to be correct.

2.2.3 Exemption Criteria

The criteria used to exempt components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exemption criteria have been applied by the Licensee in accordance with the Code, as discussed in the ISI Program Plan, and appear to be correct.

2.2.4 Augmented Examination Commitments

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

(a) NRC Generic Letter 88-01, *Intergranular Stress Corrosion Cracking* (Reference 8) and NUREG-0313, Revision 2, *Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping* (Reference 9);

(b) USNRC Regulatory Guide 1.150, *Ultrasonic Testing of Reactor Vessel Welds during Preservice and Inservice Examinations*, Revision 1 (Reference 10);

(c) NUREG-0619, *BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking*, (Reference 11);

(d) NUREG-0803, *Integrity of BWR Scram System Piping* (Reference 12); and

(e) IEB 80-13, *Cracking in Core Spray Spargers* (Reference 13).

The Licensee has not committed to perform augmented examinations in accordance with Branch Technical Position (BTP) MEB 3-1. In the September 3, 1991 RAI, the Licensee was asked to address the degree of compliance with this document. In response to the NRC RAI, the Licensee stated in the November 5, 1991 letter that no specific commitments have been made to perform augmented examinations based on guidance provided in BTP MEB 3-1, and that their position is currently being evaluated during the ongoing High Energy Line Break Program.

Standard Review Plan 3.6.2 gives specific acceptance criteria to define postulated pipe rupture locations and configurations inside containment, and for protecting against postulated pipe ruptures outside containment. BTP MEB 3-1 requires that these issues be addressed.

2.3 Conclusions

Based on the review of the documents listed above, it is concluded that the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval ISI Program Plan* is unacceptable and not in compliance with 10 CFR 50.55a(g)(4) until the issues described in MEB 3-1 have been addressed.

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements that the Licensee has determined to be impractical for the third 10-year inspection interval are evaluated in the following sections.

3.1 Class 1 Components

3.1.1 Reactor Pressure Vessel

3.1.1.1 Request for Relief No. B-A-1 (Rev. 1), Examination Category B-A, Item B1.30, Reactor Vessel Shell-to-Flange Weld

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.30, requires a 100% volumetric examination of the reactor pressure vessel (RPV) shell-to-flange weld as defined by Figure IWB-2500-4. Note 5 states that if partial examinations are conducted from the flange face, the remaining volumetric examinations required to be conducted from the vessel wall may be performed at or near the end of each inspection interval. Note 6 states that the examination of shell-to-flange welds may be performed during the first and third inspection periods, in conjunction with the nozzle examination of Examination Category B-D. At least 50% of shell-to-flange welds shall be examined by the end of the first inspection period and the remainder by the end of the third inspection period.

Licensee's Code Relief Request: Relief is requested to perform 100% of the volumetric examination of shell-to-flange Weld VFAC during the third inspection period in lieu of 50% in the first period and the remainder in the third inspection period.

Licensee's Basis for Requesting Relief: The Licensee states that by examining 100% of the weld in the third inspection period, manpower resources will be optimized by erecting staging and removing insulation for examining the shell to flange weld, the three vessel longitudinal seam welds, and the nozzles at the same

time. The calculated radiation exposure savings by removing insulation on the flange weld, the longitudinal seam welds and nozzles once instead of twice has been estimated to be approximately 3.6 REM due to 10 to 15 mrem/hr radiation field and an estimated 650 mrem for performing the exam from the vessel flange surface. Shielding is not possible since the radiation source is the examination item.

In addition, Appendix VIII "Performance Demonstration for Ultrasonic Examination Systems" of Section XI of the ASME Code is projected for mandatory implementation in 1995. By examining 100% of the shell-to-flange weld during the third inspection period to Appendix VIII requirements, the Licensee believes that the quality of the examination will be enhanced by a proven technique and qualified examination personnel.

Licensee's Proposed Alternative Examination: None. The Licensee proposes that examination of the subject weld will be performed during the third inspection period.

Evaluation: The Code requires that a 100% volumetric examination be performed on the RPV shell-to-flange weld each inspection interval. Examinations from the vessel wall may be deferred to the end of the interval if a partial examination is performed from the flange surface. The Licensee's Code relief request is to defer all examinations of the RPV shell-to-flange weld to the end of the interval in order to optimize resources by erecting staging and removing insulation only one time. However, the Licensee has not provided sufficient justification supporting the determination that the Code requirements are impractical. The Licensee's basis includes calculated radiation exposure savings for removing insulation from the vessel wall and nozzles. However, the subject examination can be performed from the flange surface without removing insulation, therefore, the exposure savings would not apply.

Conclusions: Based on the above, it is concluded the Licensee has not established that the Code-required volumetric examination is impractical. Therefore, it is recommended that relief be denied.

3.1.1.2 Request for Relief No. B-D-1 (Rev. 1), Examination Category B-D, Item B3.90, RPV Nozzle-to-Vessel Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.90, requires a 100% volumetric examination of the RPV nozzle-to-vessel welds as defined by Figure IWB-2500-7(a).

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of the following nozzle-to-vessel welds:

Recirculation Inlet Nozzles: RRAD-1, RRBD-1, RRCD-1, RRDD-1, RRED-1, RRFD-1, RRGD-1, RRHD-1, RRJD-1, RRKD-1;

Recirculation Outlet Nozzles: RCAD-1, and RCBD-1;

Core Spray Nozzles: CSAD-1, and CSBD-1;

Feedwater Nozzles: FWAD-1, FWBD-1, FWAD-2, and FWBD-2;

Jet Pump Instrumentation Nozzles: JPAD-1, and JPBD-1;

Control Rod Drive Capped Nozzle: CRDD-1;

Main Steam Nozzles: MSAD-1, MSBD-1, MSCD-1, and MSDD-1;

Isolation Condenser Nozzles: ICAD-1, and ICBD-1;

Reactor Vessel Head Spray Nozzle: HSAD-1;

Reactor Vessel Head Vent Nozzle: HIAD-1; and

Reactor Vessel Head Instrumentation Nozzle: HIBD-1.

Licensee's Basis for Requesting Relief: The Licensee states that portions of the required weld volume of the RPV and closure head nozzle-to-vessel welds cannot be ultrasonically examined to the

extent required by the Code. The limited ultrasonic examination coverage is due to the set-in-type design of the reactor vessel nozzles. The Code-required examination volume cannot be ultrasonically examined from the nozzle side due to the outer blend radius configuration. The physical design of the welds and nozzles severely restricts the examination coverage of the Code-required weld volume.

The Examination Coverage Table in the Licensee's March 30, 1992 submittal includes estimates of the Code-required volume that can be examined for the subject nozzle-to-vessel welds. Coverage of the Code-required volume range from 11% for the isolation condenser nozzles to 58% for the core spray nozzle. There are no limitations listed for the inside radius sections. Also included in that submittal are descriptions of restrictions that limit examination coverage. These restrictions include entry surface noise that limits the near surface volume (feedwater nozzles), permanently installed vessel insulation (isolation condenser, recirculation, jet-pump instrument, and control rod drive capped nozzles), vessel stabilizer support lugs (isolation condenser nozzles), and permanently installed thermocouples (feedwater nozzles). As indicated in the table, partial examinations are being performed on all nozzle-to-vessel welds.

The Licensee states that the latest ultrasonic techniques and the most advanced equipment available have been utilized to achieve the present results, including automated scanning and computerized data acquisition systems.

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

Evaluation: The Code requires that all RPV nozzle-to-vessel welds and nozzle inside radius sections receive a volumetric examination as defined by Figure IWB-2500-7(a) each inspection interval. However, as stated by the Licensee, physical and

geometric restrictions preclude ultrasonic examination of reactor vessel and closure head nozzle-to-vessel welds to the extent required by the Code.

The descriptions of the limitations and the attached drawings support the Licensee's determination that volumetric examination for the subject nozzles is impractical to perform to the extent required by the Code, due to weld component geometry, ultrasonic entry surface noise, permanent insulation, and support lugs. In order to perform the examination to the extent required by the Code, the subject nozzle-to-vessel welds would require extensive design modifications. Imposition of the requirement on Northeast Utilities would cause a burden that would not be compensated by an increase in safety above that provided by the limited examination.

The Licensee has stated that the volumetric examination of these welds will be performed to the maximum extent practical. The percentages of the Code-required volume that can and will be completed are consistent with other plants of similar design. The limited Section XI volumetric examination of these welds will provide reasonable assurance of the continued structural integrity of the subject RPV nozzle-to-vessel welds.

Conclusions: Based on the information provided by the Licensee in support of this request for relief, and the estimates of the Code-required examinations that can be performed, it is concluded that the volumetric examination of the subject nozzles is impractical to perform to the extent required the Code. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.1.1.3 Request for Relief No. B-G-1-1, Examination Category B-G-1, Item B6.10, Reactor Vessel Closure Head Nuts

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-G-1, Item B6.10, requires a 100% surface examination of reactor vessel closure head nuts each inspection interval.

Licensee's Code Relief Request: Relief is requested from performing the Code-required surface examination on the reactor vessel closure head nuts.

Licensee's Basis for Requesting Relief: Performing the Code-required surface examination involves extensive cleaning of the nuts, which produces mi waste of contaminated and hazardous material that cannot be disposed of. In addition, the Licensee states that the Code-required surface examination is excessive, which has been recognized by the Code Committee and changed to a VT-1 visual examination in the 1989 Edition of ASME Section XI.

Licensee's Proposed Alternative Examination: A VT-1 visual examination will be performed each inspection interval.

Evaluation: The 1986 Edition of the ASME Code requires a surface examination of the reactor vessel nuts. The Licensee's basis for requesting relief is that extensive cleaning of the nuts is required, which will produce a mixed waste. In addition, the Licensee states that the surface examination is replaced by a VT-1 visual examination in a later edition of the Code (1989 Edition).

The 1989 Edition of the ASME Code has been approved by the NRC and will be incorporated into the next edition of the Regulations. However, the change from a surface examination to the VT-1 visual examination for Item B6.10 occurs in the 1989 Addenda, which has not been approved by the NRC, and therefore is not an acceptable alternative. In addition, the nuts must be cleaned properly to perform an effective VT-1 visual

examination, therefore, the production of mixed waste should occur for visual as well as surface examinations.

Conclusions: Based on the above, the Licensee has not established that the Code-required surface examination is impractical, therefore, it is recommended that relief be denied.

3.1.2 Pressurizer (Not Applicable)

3.1.3 Heat Exchangers and Steam Generators (No relief requests)

3.1.4 Piping Pressure Boundary

3.1.4.1 Request for Relief No. B-G-2-1 (Rev. 1), Examination Category B-G-2, Items B7.50 and B7.70, Pressure Retaining Bolting for Piping and Valves

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-G-2, Items B7.50 and B7.70 require a VT-1, visual examination of the surface of all bolts, studs, and nuts 2 inches in diameter and less, each inspection interval. Note 1 states that bolting may be examined (a) in place under tension, (b) when the connection is disassembled, or (c) when the bolting is removed. Note 2 states that for heat exchangers, piping, pumps, and valves, examinations are limited to components selected for examination under Examination Categories B-B, B-J, B-L-2, and B-M-2.

Licensee's Code Relief Request: Relief is requested from performing the Code-required VT-1 visual examination of bolted components that are in place and under tension on insulated components located in radiation and high radiation areas. Relief is requested for 64 bolted connections.

Licensee's Basis for Requesting Relief: The Licensee states that 233 bolted components are subject to visual examination each

10-year interval. Sixty-four of the bolted connections are located in radiation or high radiation areas and are covered with removable metallic reflective or fiberglass pad insulation. In order to perform the VT-1 visual examination, the insulation must be removed, then replaced after the examination. In some locations, staging must be erected prior to insulation removal. The estimated radiation exposure based on area dose rates has been calculated to be 10.73 Rem for the 64 components. Shielding is not practical since the source of radiation is the examination item. Remote visual examination is also not practical due to the insulation covering the component bolting. To date, Millstone Unit 1 has completed 100% Category B-G-2 visual examinations twice during the past 20 years of operation. No service-induced failures were identified by in-place, under tension visual examination. Boric acid corrosion is not a concern at a boiling water reactor. In addition, a VT-2 visual examination for leakage is performed on all Category B-G-2 components each refueling outage during operational leak testing of the reactor vessel and Class 1 components.

Licensee's Proposed Alternative Examination: None. The Code-required visual examination will be performed when components are disassembled for maintenance.

Evaluation: The Code requires a VT-1 visual examination of Class 1 bolting 2 inches in diameter or less. The Code allows the examination to be performed in place under tension, when the connection is disassembled, or when the bolting is removed. The Licensee requests relief from the Code-required examination based on ALARA concerns, and proposes to examine the bolts only when the components are disassembled for maintenance.

The Licensee's submittal lists of the affected components and the associated dose rates, which range from 10 to 500 mrem/hour. Only nine of the sixty-four components listed exceed 200 mrem/hour. Although there is no clearly defined amount of radiation exposure that is considered "too much", it is difficult

to see the ALARA concern for the low dose rates listed for the majority of the components. For the components listed with higher dose rates, there is inadequate information to determine the actual exposure. In addition, there is only one component listed that requires staging to remove the insulation and perform the examination; therefore, the burden on the Licensee is not apparent. Considering the flexibility allowed by the Code for performing the VT-1 visual examination, there is insufficient justification for granting relief.

Conclusions: Based on the above evaluation, it is recommended that relief be denied.

3.1.4.2 Request for Relief No. B-J-1, Examination Category B-J, Item B9.11, Class 1 Piping Welds at Containment Penetrations

Code Requirement: Section XI, Table IWA-2500-1, Examination Category B-J, Item B9.11, requires both 100% surface and volumetric examination of circumferential welds in piping 4 inch NPS and larger as defined by Figure IWA-2500-8.

Licensee's Code Relief Request: Relief is requested to use the exemption from examination provided for inaccessible penetration welds under ASME Code Case N-198-1, "Exemption From Examination for ASME Code Class 1 and 2 Piping Located at Containment Penetrations, Section XI, Division 1." The affected welds are listed as follows:

System	Weld Number
CORE.SPR	(A)X-16A and (B)X-16B
FEED.WTR	(A)X-9A and (B)X-9A
ISOC.RET	(B)X-11B and (A)X-10A
LPCI	(A)X-43 and (B)X-45
MAIN.STM	(A)X-7A, (B)X-7B (C)X-7C, (D)X-7D and (E)X-8
RWCU.SUP	(B)X-15 and (A)X-14
SHUTCOOL	(A)X-12

Licensee's Basis for Requesting Relief: The Licensee states that the ASME Code Committee has recognized that the examination of these welds is not possible. These welds are continuously monitored for leakage by the drywell sump monitoring system. The leakage limits are contained in Millstone Unit 1 Plant Technical Specifications. All of the welds are subject to System Pressure Tests under the requirements of Category B-P.

Licensee's Proposed Alternative Examination: None. The Licensee states that a liquid penetrant examination on the inside surface will be performed if the weld is made accessible due to piping repairs or replacement. A VT-2 visual examination will be performed each outage.

Evaluation: The Licensee's Code relief request is to exempt the subject welds from examination under ASME Code Case N-198-1. However, N-198-1 has not been approved for general use by reference in NRC Regulatory Guide 1.147, therefore exempting the welds from examination is not acceptable. However, it is obvious from the Licensee's drawings that the subject welds are encapsulated in penetrations and inaccessible for examination. Therefore, the Code-required surface and volumetric examinations are impractical to perform. In order to examine the welds in accordance with requirements, the piping penetrations would have to be redesigned and replaced.

Other plants are examining the closest adjacent, pressure retaining weld in lieu of the pipe penetration weld. Examination of the closest adjacent weld, along with the VT-2 visual examination and system pressure test, will provide reasonable assurance of the structural integrity of the subject welds.

Conclusions: It is concluded that the Code-required volumetric and surface examinations of the subject piping penetration welds are impractical to perform at Millstone Nuclear Power Station, Unit 1. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted, provided that the closest

adjacent pressure retaining welds are examined in lieu of the piping penetration welds.

3.1.4.3 Request for Relief No. B-J-2, Examination Category B-J, Item B9.31, Class 1 Branch Pipe Connection Welds

Code Requirement: Section XI, Table IWA-2500-1, Examination Category B-J, Item B9.31, requires both surface and volumetric examinations of branch pipe connection welds NPS 4 or larger as defined by Figure IWA-2500-10.

Licensee's Code Relief Request: Relief is requested from performing 100% of the Code-required volumetric examination. The Licensee states that approximately 70% of each of the following main steam, recirculation, and shutdown cooling system welds can be examined:

MSAJ-RV1 thru -RV7	MSBJ-RV1 thru -RV3
MSCJ-RV1 thru -RV3	MSDJ-RV1 thru -RV6
RCAJ-PB1 thru -PB2	RCBJ-PB1 thru -PB2
SCAJ-CU1	

Licensee's Basis for Requesting Relief: The Licensee states that the main steam welds cannot be examined from the weldolet side due to the configuration and extra large weld crown widths. The recirculation system welds cannot be examined from the 28 inch side due to thickness differences between the 28 inch pipe wall and the 4 inch weldolet. The weld in the shutdown cooling system cannot be examined from the weldolet side due to configuration of the weldolet.

Meaningful radiographic examination can only be performed on these welds by placing the film or source on the inside surface of the weld, which is not practical during normal inservice inspection.

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

Evaluation: The geometric configuration of the subject welds is such that 100% of the Code-required volume of the branch connection welds cannot be examined. Therefore, the design of the subject Class 1 branch pipe connection welds make the Code-required examination impractical to perform. In order to examine the welds in accordance with the requirements, the welds would have to be redesigned and replaced. The increase in plant safety would not compensate for the burden placed on the Licensee by imposition of this requirement.

The Licensee states that approximately 70% of the Code-required volume can be examined. The limited volumetric examination, along with the Code-required surface examination, will provide reasonable assurance that structural integrity is maintained in the subject branch connections.

Conclusions: It is concluded that volumetric examination of the subject Class 1 branch connection welds is impractical to perform to the extent required by the Code at Millstone Nuclear Power Station, Unit 1. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.1.5 Pump Pressure Boundary

3.1.5.1 Request for Relief No. B-L-2-1, Examination Category B-L-2, Item B12.20, Pump Casing Internal Surfaces

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-L-2, Item B12.20, requires a VT-3 visual examination of internal surfaces of at least one pump in a group of pumps performing similar functions in the system. The examination may be performed at the end of the 10-year interval.

Licensee's Code Relief Request: Relief is requestod from performing the Code-required visual examination on the internal surfaces of any of the reactor recirculation pumps.

Licensee's Basis for Requesting Relief: The Code requirement to disassemble an operable reactor recirculation pump for the sole purpose of an ISI visual examination provides a very small potential for increasing plant safety margins, while increasing expenditures, radiation exposure, critical path time, and manpower resources. During the 1984 outage, a VT-3 visual examination was performed when one of the two pumps was disassembled for maintenance. No degradation of the pump internal surface due to erosion, corrosion, or cracking was observed. In addition, later editions of the Code (1988 Addenda) require internal visual examinations only when the pumps are disassembled for maintenance.

Licensee's Proposed Alternative Examination: None. The Code-required visual examination will be performed if a pump is disassembled for maintenance. In addition, a VT-2 visual examination for leakage will be performed during each refueling outage.

Evaluation: The examination requirement for internal surfaces of pumps necessitates complete disassembly of the pump. The disassembly of the reactor recirculation pump for the sole purpose of visual examination of the casing internal surface is a major effort and requires many manhours from skilled maintenance and inspection personnel while causing excessive radiation exposure. Therefore, the Code requirement is impractical. The visual examination is performed to determine if unanticipated degradation of the casing is occurring due to phenomena such as erosion, corrosion, or cracking. However, no degradation of the pump internal surface was observed when a VT-3 visual examination was performed on one of the two pumps during the 1984 outage.

Later editions and addenda of the ASME Code (after 1988) have eliminated disassembly of pumps for the sole purpose of examining the internal surfaces and state that the internal surface visual examination requirement is only applicable to pumps that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the pump casing, if the pump is disassembled for maintenance, is acceptable. Since no problems have been reported in the industry with regard to pump casing internal surfaces, the Licensee's proposal will provide adequate assurance of the continued inservice structural integrity.

Conclusions: It is concluded that disassembly of a pump for the sole purpose of inspection is impractical to perform at Millstone Nuclear Power Station, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative in lieu of the Code requirements. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted provided that, if the pumps have not been disassembled, this fact is reported by the Licensee in the ISI Summary Report at the end of the interval.

3.1.6 Valve Pressure Boundary

3.1.6.1 Request for Relief No. B-M-2-1, Examination Category B-M-2, Item B12.50, Valve Body Internal Surfaces

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-M-2, Item B12.50, requires a VT-3 visual examination of the internal surfaces of valve bodies exceeding 4 inches nominal pipe size. Examinations shall be conducted on at least one valve in each group of valves that are of the same design (such as globe, gate, or check valve, and manufacturing method) and perform similar functions in the system. The examination may be performed at the end of the 10-year interval.

Licensee's Code Relief Request: Relief is requested from performing the Code-required VT-3 visual examination on the internal surfaces of the following valves:

1-FW-9A & B	1-FW-10A & B	1-LP-11A & B
1-CS-6A & B	1-CU-29	1-RR-1A & B
1-LP-10A & B	1-IC-1 & 2	1-SD-1 & 5
1-CS-7A & B	1-CS-5A & B	1-IC-3 & 4
1-RR-2A & B	1-RR-4A & B	1-LP-12A & B
1-FW-11A & B	1-SD-2A & B	
1-MS-1A, B, C, & D	1-MS-3A, B, C, D, E, & F	
1-MS-2A, B, C, & D	1-CU-1, 2, 3, 5, 28 & 30	

Licensee's Basis for Requesting Relief: The Code requirement to disassemble an operable valve for the sole purpose of an ISI visual examination provides a very small potential for increasing plant safety margins, while increasing expenditures, radiation exposure, critical path time, and manpower resources. Performing visual examinations when the valve is disassembled for maintenance has been an ongoing practice at Millstone Nuclear Power Station, Unit 1, and thus far, no degradation of valve body internal surfaces due to erosion, corrosion, or cracking has been observed. In addition, later editions of the Code (1988 Addenda) require internal visual examinations only when valves are disassembled for maintenance.

Licensee's Proposed Alternative Examination: None. The Code-required visual examination will be performed if a valve is disassembled for maintenance. In addition, a VT-2 visual examination for leakage will be performed during each refueling outage.

Evaluation: The examination requirement for internal surfaces of valves necessitates complete disassembly of the valve. The disassembly of valves for the sole purpose of visual examination of the valve body internal surface is a major effort and requires many manhours from skilled maintenance and inspection personnel

and may cause excessive radiation exposure. Therefore, the Code requirement is impractical. The visual examination is performed to determine if unanticipated degradation of the valve body is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous experience during examination of similar valves at other plants has not shown any significant degradation of the valve bodies. The increase in plant safety would not compensate for the burden on the Licensee that would result from imposition of this requirement.

Later editions and addenda of the ASME Code (after 1988) have eliminated disassembly of valves for the sole purpose of performing visual examinations of the internal surfaces and state that the internal surface visual examination requirement is only applicable to valves that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the valve casing, if the valve is disassembled for maintenance, is acceptable. Since no major problems have been reported in the industry with regard to valve bodies, the Licensee's proposal will provide adequate assurance of the continued inservice structural integrity.

Conclusions: It is concluded that disassembly of a valve for the sole purpose of inspection is impractical to perform at Millstone Nuclear Power Station, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative examination in lieu of the Code requirements. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted provided that, if a valve has not been disassembled, this fact is reported by the Licensee in the ISI Summary Report at the end of the interval.

3.1.7 General

3.1.7.1 Request for Relief No. IWB-1, Subarticle IWB-2430, Additional Examinations

Code Requirement: Section XI, Subarticle IWB-2430, requires additional examinations as follows:

(a) Examinations performed in accordance with Table IWB-2500-1 that reveal indications exceeding the acceptance standards of Table IWB-3410-1 shall be extended to include additional examinations at this outage. The additional examinations shall include the remaining welds, areas, or parts included in the inspection item listing and scheduled for this and the subsequent period. If the examinations for that inspection item are not scheduled in the subsequent period, the most immediate period containing scheduled examinations shall be taken as the subsequent period.

(b) If the additional examinations required by (a) above reveal indications exceeding the acceptance standards of Table IWB-3410-1, the examinations shall be further extended to include additional examinations at this outage. The additional examinations shall include all the welds, areas, or parts of similar design, size, and function.

(c) For the inspection period following the period in which the examinations of (a) or (b) above were completed, the examinations shall be performed as normally scheduled in accordance with IWB-2400.

Licensee's Code Relief Request: Relief is requested from performing additional examinations as required by IWB-2430.

Licensee's Basis for Requesting Relief: The additional examination requirements section of IWB-2430 uses the phrase "that reveal indications exceeding the acceptance standards" to require an additional examination sample to be performed. "Indication" as defined in the Glossary (IWA-9000) refers to the response or evidence from the applications of nondestructive examination. This response or evidence from an examination may not be a flaw.

The Licensee states that there is no mention in the additional examination requirements of IWB-2430 about relevant conditions or if these requirements apply to a pressure test. If a crack in a stainless steel piping weld Item B9.11 was found during an examination, additional examinations on carbon steel pipe welds that fall under the same item number would be required. The existing requirements of IWB-2430 would cause an extreme hardship due to examination personnel radiation exposure, manpower resources, and increased critical path outage time.

Licensee's Proposed Alternative Examination: The Licensee proposes the following in lieu of the Code:

(a) Examinations will be performed in accordance with Table IWB-2500-1, except for examination categories B-E and B-P, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1 will be extended to include additional examinations this outage. The additional examinations will include an additional number of welds, areas, or parts included in the inspection item equal in number to the welds, areas, or parts included in the inspection item that were scheduled to be performed during the present inspection period. The additional examinations will be selected from welds, areas, or parts of similar material and service. This additional selection may require the inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If additional examinations required by (a) above reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB-3410-1, the examinations will be further extended to include additional examinations at this outage. These additional examinations will include the remaining number of welds, areas, or parts, of similar material and service subject to the same type of flaws or relevant conditions.

Evaluation: Additional examinations are required by the Code when examinations performed in accordance with Table IWB-2500-1 reveal indications that exceed Code acceptance standards. Additional examinations, per the Code, are to include the remaining welds, areas, or parts that are included in the Code inspection item number, and scheduled for the current and subsequent period. In lieu of the Code requirement, the Licensee

proposes additional examination of an equal number of welds, areas, or parts within the subject inspection item number scheduled for examination during the current period. These additional examinations are to be selected from welds, areas, or parts of similar material and service and subject to the same type of flaws or relevant conditions as the original component.

The additional examinations required by the Code blanket all components within the inspection item without consideration for the cause of the unacceptable flaw. This approach requires examination of unrelated components that may not be susceptible to the flaw-causing condition. The Licensee's proposed alternative allows some latitude so that engineering judgement can be applied to determine where additional examinations are needed. Thus, generic problems can be identified and examinations concentrated on only susceptible components.

Although the Licensee's proposed alternative may result in a reduced number of additional examinations, the examinations that are performed will be made more effective by concentrating inspections in areas susceptible to the conditions that caused the original flaw. In addition, the alternative has potential ALARA benefits without compromising the level of quality and safety.

Conclusions: Based on the above evaluation, it is concluded that the proposed alternative will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the Licensee's proposed alternative be authorized, provided that the requirements of Paragraph IWB-2430(c) are also met.

3.2 Class 2 Components

3.2.1 Pressure Vessels

3.2.1.1 Request for Relief No. C-A-1 (Rev. 2), Examination Category C-A, Item C1.30, Low Pressure Coolant Injection (LPCI) Heat Exchanger Tubesheet-to-Shell Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-A, Item C1.30, requires a 100% volumetric examination of the tubesheet-to-shell welds as defined by Figure IWC-2500-2. In the case of multiple vessels of similar design, size, and service (i.e. steam generators, heat exchangers), the required examinations may be limited to one vessel or distributed among the vessels.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination on 100% of the following upper and lower tubesheet-to-shell welds on the LPCI heat exchangers:

CCAC-A-1 CCAC-A-2 CCBC-A-1 CCBC-A-2

Licensee's Basis for Requesting Relief: The Licensee states that the LPCI heat exchanger's tubesheet-to-shell welds cannot be 100% ultrasonically examined due to physical interferences. The weld cannot be examined from the tubesheet side due to the closeness of the water box-to-tubesheet weld (as shown in Drawing 25202-20338, sheet 54). The inlet and outlet nozzle reinforcing pads and vent/drain sockolet welds also prevent ultrasonic examination from the shell side on approximately 12 inches of the 97 inch weld length. Radiography is not a practical volumetric examination due to the geometry of the tubesheet weld.

Licensee's Proposed Alternative Examination: The Code-required examination volume will be examined to the extent practical from the shell side of the heat exchanger tubesheet-to-shell weld

using a 1-1/2 vee path technique. Approximately 85% of the weld can and will be examined. In addition, a surface examination will be performed on the entire length of the subject welds.

Evaluation: The Code requires a 100% volumetric examination of the subject tubesheet-to-shell welds. However, as depicted in the drawing (25202-20338, sheet 54) attached to the relief request, the ultrasonic examination cannot be performed from the tubesheet side of the welds due to the proximity of the adjacent weld. Access from the shell side is limited to approximately 85% of the weld length due to the inlet and outlet nozzle geometry. Therefore, the volumetric examinations are impractical to perform to the extent required by the Code. In order to perform the examination to the extent required by the Code, the LPCI heat exchangers would require extensive design modifications. Imposition of the requirement on the Licensee would cause a burden that would not be compensated by an increase in safety above that provided by the limited examination.

The Licensee's proposed alternative is to perform a one-sided examination using the 1-1/2 vee-path technique. Article III-3230, "Angle Beam Calibration," in Mandatory Appendix III states:

> "Variables such as weld preparation, weld crown width, or physical interference may preclude obtaining two beam path direction coverage of the complete examination volume with half-V examination from two sides as shown in Figure III-3230-1. If this interference with examination coverage occurs, the beam path shall be increased as required to obtain full coverage of the examination volume from two directions."

A two-direction examination can be achieved from one side of the weld. Therefore, the Licensee's proposal to perform a one sided examination to the maximum extent practical is appropriate and will provide adequate assurance of the continued structural integrity of the subject LPCI heat exchangers.

Conclusions: Based on the above evaluation, it is concluded that the volumetric examination of the subject tubesheet-to-shell welds is impractical to perform to the extent required by the Code. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.2.1.2 Request for Relief No. C-B-1, Examination Category C-B, Item C2.21, Isolation Condenser Nozzle-to-Shell (or Head) Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-B, Item C2.21, requires both surface and volumetric examinations of the isolation condenser nozzle-to-shell welds as defined by Figure IWC-2500-4(a) or (b).

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of isolation condenser (IC) nozzle-to-head Welds ICAC-B-1 and -2, and ICBC-B-3 and -4.

Licensee's Basis for Requesting Relief: The Licensee states that approximately 40% of the Code-required volume of each weld can be ultrasonically examined. The weld joint configuration of the subject welds does not permit 100% ultrasonic examination of the required volume. Scanning is limited to 1/2 vee by attenuation caused by vessel and nozzle stainless steel cladding on the ID. Scanning with the 1/2 vee technique from the head side of the nozzles does not cover the full required volume due to head thickness. Radiography is not practical because the ID is inaccessible without grinding out the diaphragm seal weld on the access manway and rewelding it.

Licensee's Proposed Alternative Examination: None. The Code-required surface examination will be performed in addition to the volumetric examination to the extent practical.

Evaluation: As shown in the drawing (25202-20338, sheet 51) supplied by the Licensee, the weld joint geometry precludes a

100% ultrasonic examination. In addition, scanning is limited to a 1/2 vee from the vessel side due to attenuation caused by vessel and nozzle cladding on the ID surface. Therefore, the volumetric examination is impractical to perform to the extent required by the Code. In order to perform the Code-required examination, the IC would have to be redesigned and replaced. Imposition of this requirement on Northeast Utilities would cause a burden that would not be compensated by an increase in safety above that provided by the limited examination. The limited volumetric examination, along with the Code-required surface examination, will provide reasonable assurance of the structural integrity of the subject welds.

Conclusions: It is concluded that volumetric examination is impractical to perform to the extent required by the Code at Millstone Nuclear Power Station, Unit 1. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.2.1.2 Request for Relief No. C-B-2, Examination Category C-B, Item C2.21, Shutdown Cooling Heat Exchanger Nozzle-to-Shell Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-B, Item C2.21, requires both surface and volumetric examinations of the shutdown cooling heat exchanger nozzle-to-shell welds as defined by Figure IWC-2500-4(a) or (b).

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of heat exchanger nozzle-to-shell (head) welds SDAC-B-1 and SDBC-B-1 on Heat Exchanger A, and SDAC-B-2, and SDBC-B-2 on Heat Exchanger B.

Licensee's Basis for Requesting Relief: The Licensee states that approximately 40% of the required volume can be examined. The weld joint configuration of the subject welds does not allow the required ultrasonic volume coverage from the shell side of the vessel due to the thickness of the shell. Radiography of these

welds is not practical because the film would have to be placed on the ID of the nozzles. Accessibility to the ID is limited by the system's operation during normal refueling outages.

Licensee's Proposed Alternative Examination: None. The Code-required surface examination will be performed in addition to the volumetric examination to the extent practical.

Evaluation: As shown in the drawing (25202-20338, sheet 53) supplied by the Licensee, the weld joint geometry precludes 100% ultrasonic examination of the heat exchanger nozzle-to-shell welds. Therefore, the volumetric examination is impractical to perform to the extent required by the Code. In order to perform the Code-required examination, the subject heat exchangers would require extensive design modifications. Imposition of the requirement on Northeast Utilities would cause a burden that would not be compensated by an increase in safety above that provided by the limited examination. The limited volumetric examination, along with the Code-required surface examination will provide reasonable assurance of the structural integrity of the subject welds.

Conclusions: It is concluded that the volumetric examination is impractical to perform to the extent required by the Code at Millstone Nuclear Power Station, Unit 1. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.2.2 Piping

3.2.2.1 Request for Relief No. C-C-1 (Rev. 1), Examination Category C-C, Item C3.20, Integrally Welded Attachments

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-C, Item C3.20, requires a 100% surface examination of integrally welded attachments to Class 2 piping as defined by Figure IWF-2500-5. Attachments selected are limited to those

components required to be examined under Examination Categories C-F and C-G.

Licensee's Code Relief Request: Relief is requested from performing surface examinations of Class 2 piping integrally welded attachments as required by Examination Category C-C.

Licensee's Basis for Requesting Relief: The Licensee states that the piping integral attachment welds on systems whose piping welds are required to be examined under Examination Category C-F received a surface examination during the past 10-year ISI interval. After 20 years of commercial operation, no service-induced deficiencies were identified. Because of the examination results, the Licensee believes that performing surface examinations on the same support attachments again is impractical and will not provide any additional assurance that the structural integrity of the piping system is maintained. The Licensee believes that the proposed selection criteria will increase the quality of the Millstone, Unit 1 ISI Program.

Licensee's Proposed Alternative Examination: In lieu of performing the Code-required surface examination on only those attachments required under Examination Category C-C, the Licensee proposes to examine integral attachment welds to Class 2 piping regardless of the pipe wall thickness exemption of Item C5.10 of Examination Category C-F. The alternative weld selection will include support attachments that are currently exempt from examination and have not been previously examined (i.e., attachments on piping less that 3/8" wall thickness). The proposed number of supports requiring surface examination during the third 10-year interval will be greater than the number selected presently under Category C-C.

Evaluation: The Licensee proposes to perform surface examination of a greater number of integrally welded attachments than that required by Examination Category C-C, in lieu of the welds selected under the criteria of that category. However, the

proposed alternative does not include enough detail to evaluate the proposal.

The Code provides the minimum examination requirements for performing inservice inspection of components. Examining components not required by the Code is always acceptable, provided that the minimum examination requirements of the Code are met. The Licensee has stated that the selection of integrally welded attachments would not include the Code-required integral attachments, but has not provided adequate justification that the Code-required surface examination is impractical.

Conclusions: Based on the above evaluation, it is recommended that relief be denied.

3.2.3 Pumps (No relief requests)

3.2.4 Valves (No relief requests)

3.2.5 General

3.2.5.1 Request for Relief No. IWC-1, Paragraph IWC-1220, Exemption Criteria for Examination Categories C-A, C-B, C-C, and C-F-2

Code Requirement: Section XI, Table IWC-2500-1, Examination Categories C-A, C-B, C-C, and C-F-2, require volumetric and/or, surface examinations of pressure vessel welds, nozzle-to-vessel welds, integral attachments for vessels, piping, pipes and valves, and pressure retaining welds in carbon or low alloy steel piping.

Licensee's Code Relief Request: Relief is requested to continue to use Paragraph IWC-1220(c), "Exempted Components" of Section XI of the ASME Code, 1974 Edition through Summer 1975 Addenda to exempt the feedwater coolant injection (FWCI) system from the

examination requirements of Categories C-A, C-B, C-C and C-F-2 of the 1986 Edition of ASME Section XI.

Licensee's Basis for Requesting Relief: The Licensee states that Millstone Nuclear Power Station, Unit 1, is the only nuclear unit in the country that has equipment continuously on line serving as an emergency core cooling system (ECCS). The FWCI system supplies makeup water from the main condenser hotwell through the condensate and feedwater system to the reactor vessel in the event of a loss-of-coolant accident due to a small break in the primary coolant system. The Class 2 portion of the FWCI system consists of piping from the condenser hotwell to the outside containment isolation feedwater check valve and includes three condensate pumps, three condensate booster pumps, seven condensate demineralizers, three reactor feed pumps, and ten feedwater heaters. Piping and components from the outside containment isolation feedwater check valve to the reactor vessel are Class 1 and examined in accordance with the Code. The FWCI system operates continuously during all modes of power operation.

The FWCI system piping and components are carbon steel and not susceptible to intergranular stress corrosion cracking (IGSCC). The condensate and feedwater purity is stringently controlled via seven parallel-arranged, mixed-resin bed, full-flow condensate demineralizers. During power operation, water conductivity and oxygen levels are monitored continuously. Daily water samples are taken and analyzed for conductivity, oxygen, chlorides, and organic compounds.

An erosion/corrosion pipe inspection program in areas susceptible to turbulent flow is ongoing because of IE Bulletin 87-01, *Thinning of Piping Walls in Nuclear Power Plants*. Ultrasonic thickness inspections during the past two refueling outages identified no degradation of a system that has been in operation for 20 years. Remote visual examinations using TV cameras inside feedwater piping were also performed with no observed erosion or corrosion degradation. In addition, eddy current examinations

are performed routinely on feedwater heaters as part of the "Balance of Plant Reliability Program." Visual examination of the FWCI component supports to Article IWF requirements and surface examinations on integral attachments to Examination Category C-C requirements have been performed in accordance with the Code during the second 10-year interval with no relevant surface indications.

In order to expose piping or component surfaces for examination, staging must be erected and tenting built around the component or pipe in order to contain and remove asbestos insulation. Staging erection/removal and asbestos abatement are the major outage expense when adhering to the current Federal EPA, OSHA, and Connecticut State asbestos abatement policies. Disposal of contaminated asbestos as "mixed waste" is an additional major outage expense.

Based upon the uniqueness of the Millstone 1 FWCI system, its continuous power operation, the cost of scaffolding erection and asbestos insulation abatement, and the small probability of NDE indications, the Licensee believes that inclusion of the FWCI system into the Class 2 ISI program is unwarranted and that present ongoing examinations and testing provide adequate assurance that the system's structural integrity is maintained.

Licensee's Proposed Alternative Examination: None.

Evaluation: 10 CFR 50.55a(b)(2)(iv) states that Class 2 pipe welds in the emergency core cooling system (ECCS) shall be examined. The Licensee is requesting relief from examining the entire FWCI based on the chemistry control exemption of the 1974 Edition, Summer 1975 Addenda of the Code. The use of "chemistry control" to exempt a system from examination is not acceptable. The NRC does not accept system chemistry control as a basis for exempting components from examination because practical evaluation, review, and acceptance standards cannot be defined.

The FWCI system is part of the ECCS and, as such, cannot be completely exempted from examination. In addition, the FWCI system is a large, complex, primarily carbon steel system with many lines exceeding 20 inches in diameter. Although IGSCC is not a generic problem in carbon steel materials, it is not the only possible failure mode, therefore, examination of the FWCI system should not be completely eliminated.

Conclusions: Based on the above evaluation, it is recommended that relief be denied.

3.2.5.2 Request for Relief No. IWC-2, Subarticle IWC-2430, Additional Examinations

Code Requirement: Section XI, Subarticle IWC-2430, requires additional examinations as follows:

(a) Examinations that detect indications exceeding the allowable standards of IWC-3000 shall be extended to include an additional number of components (or areas) within the same examination category, approximately equal to the number of components (or areas) examined initially during the inspection.

(b) If these additional examinations detect further indications exceeding allowable standards of IWC-3000, the remaining number of similar components (or areas) within the same examination category shall be examined to the extent specified in Table IWC-2500-1, except as modified by (c) and (d) below.

(c) Where the required piping examinations are limited to one loop or branch run of an essentially similar piping configuration, examinations that reveal indications exceeding the allowable standards of IWC-3000 shall require the additional examinations of (a) above and shall be extended to include examination of a second loop or branch to the extent specified in Table IWC-2500-1.

(d) If the examination of the second loop or branch reveals further indications exceeding the allowable standards of IWC-3000, the remaining number of loops or branch runs that perform similar function shall be examined.

Licensee's Code Relief Request: Relief is requested from performing additional examinations as required by IWC-2430.

Licensee's Basis for Requesting Relief: The additional examination requirements section of IWC-2430 uses the phrase "that reveal indications exceeding the acceptance standards" to require an additional examination sample to be performed. Indication as defined in the Glossary IWA-9000, refers to the response or evidence from the applications of nondestructive examination. This response or evidence from an examination may not be a flaw.

The Licensee states that there is no mention in the additional examination requirements of IWC-2430 of relevant conditions or if these requirements apply to pressure tests. No consideration of material or service differences are allowed. A crack on an isolation condenser nozzle-to-shell weld under Examination Category C-B would require a shutdown cooling heat exchanger nozzle-to-shell weld to be examined if it was scheduled during the same inspection period. The Code requirements for additional examinations are based solely on examination category.

Licensee's Proposed Alternative Examination: The Licensee proposes the following:

(a) Examinations performed in accordance with Table IWC-2500-1, except for Examination Category C-H, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWC-3410-1 will be extended to include additional examinations at this outage. The additional examinations will include an additional number of welds, areas, or parts included in the inspection item equal in number to 20% of the welds, areas, or parts included in the inspection item that were scheduled to be performed during the inspection interval. The additional examinations will be selected from welds, areas, or parts of similar material and service. This additional selection may require the inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If additional examinations required by (a) above reveal flaws or relevant conditions exceeding the acceptance

standards of Table IWC-3410-1, the examinations will be further extended to include additional examinations at this outage. These additional examinations will include the remaining welds, areas, or parts, of similar material and service subject to the same type of flaws or relevant conditions.

(c) For the inspection period following the period in which the examinations of (a) or (b) above were completed, the examinations will be performed as normally scheduled in accordance with IWC-2400.

Evaluation: Additional examinations are required by the Code when indications that exceed Code acceptance standards are detected. Additional examinations, per the Code, are to include an additional number of components (or areas) within the same examination category, equal to the number of components (or areas) examined initially during the inspection. In lieu of the Code requirement, the Licensee proposes additional examinations within subject inspection item, equal in number to 20% of the welds, areas or parts included in the inspection item and scheduled for examination during the current interval. These additional examinations are to be selected from welds, areas, or parts of similar material and service, and subject to the same type of flaws or relevant conditions as the original component.

The additional examinations required by the Code blanket all components within the inspection item without consideration for the cause of the unacceptable flaw. This approach requires examination of unrelated components that may not be susceptible to the flaw-causing condition. The Licensee's proposed alternative allows some latitude so that engineering judgement can be applied to determine where additional examinations are needed. Thus, generic problems can be identified and examinations concentrated on only appropriate components.

Although the Licensee's proposed alternative may result in a reduced number of additional examinations, the examinations that are performed will be made more effective by concentrating

inspections in areas susceptible to the conditions that caused the original flaw. In addition, the alternative has potential ALARA benefits without compromising the level of quality and safety.

Conclusions: Based on the above evaluation, it is concluded that the proposed alternative will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the Licensee's proposed alternative be authorized as requested.

3.3 Class 3 Components

3.3.1 Piping (No relief requests)

3.3.2 Pumps (No relief requests)

3.3.3 Valves (No relief requests)

3.3.4 General

3.3.4.1 Request for Relief No. D-B-1 (Rev. 1), Examination Category D-B, Items D2.20 and D2.40, Integral Attachments

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B, Items D2.20 and D2.40, require VT-3 visual examination of Class 3 integral attachments as defined by Figure IWD-2500-1. In the case of multiple components within a system of similar design, function, and service, the integral attachment of only one of the multiple components must be examined. The integral attachments selected for examination shall correspond to those component supports selected by IWF-2510(b).

Licensee's Code Relief Request: Relief is requested from visual examination of integral attachments of component supports,

restraints, and spring type supports required by Examination Category D-B.

Licensee's Basis for Requesting Relief: The Licensee states that the integral attachments on components requiring visual examination in accordance with Examination Category D-B were examined during the past 10-year inspection interval. After 20 years of commercial operation, no service-induced deficiencies were identified at Millstone, Unit 1. Additionally, in a recent survey of other nuclear power plants, no in-service failures were identified on Category D-B integral attachments. Due to the low energy of piping systems, a failure due to service operations is highly unlikely. The reduced number of examinations in the proposed alternative is based upon previous examination results and represent a cost savings measure to reallocate manpower resources.

Licensee's Proposed Alternative Examination: In lieu of performing visual examinations on all the Code-required, Category D-B attachment welds, the Licensee will perform visual examination on 10% of Category D-B integral attachments.

Evaluation: Examination Category D-B requires a VT-3 visual examination of integral attachments in accordance with Note 3 of Table IWD-2500-1. Note 3 states, in part: "The integral attachments selected for examination shall correspond to those component supports selected by IWF-2510(b)." In Relief Request IWF-1 (Section 3.5.3.2 of this report), the Licensee proposes to use NRC Code Case N-491 for the selection of component supports in lieu of the Code requirements. Code Case N-491 has been found to be an acceptable alternative to the Code in Request for Relief IWF-1 for the selection requirements of Section IWF. Therefore, the reference to paragraph IWF-2510(b) in Note 3 of Table IWD-2500-1, would refer to paragraph IWF-2510 of Code Case N-491. Paragraph IWF-2510 refers to Table IW_-2500 of the Code Case, which requires a 25% sample for Class 1 piping supports, a 15% sample for Class 2 piping supports, a 10% sample for Class 3

piping supports, and 100% sample of all other supports. Assuming that this relief request only includes piping supports, the proposed alternative provides an acceptable level of quality and safety. Extending the request to include supports other than those attached to piping is not acceptable and cannot be evaluated due to insufficient information.

Conclusions: The proposed alternative will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the Licensee's proposed alternative be authorized, provided that 10% of integral attachments to Class 3 piping are examined, and 100% of all other integral attachments are examined as required in NRC Code Case N-491.

3.4 Pressure Tests

3.4.1 Class 1 System Pressure Tests

3.4.1.1 Request for Relief No. B-P-1 (Rev. 1), Examination Category B-P, Items B15.11, B15.51, B15.61 and B15.71, Class 1 Pressure Tests

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-P, Items B15.11, B15.51, B15.61 and B15.71 require a system hydrostatic test of the Class 1 pressure boundary, once per 10-year ISI interval in accordance with IWB-5222.

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic test on the reactor vessel and closure head, head spray and vent, reactor recirculation, main steam, feedwater, standby liquid control, low pressure coolant injection, core spray, isolation condenser, reactor shutdown cooling, reactor water clean-up, control rod drive, and reactor pressure instrumentation systems.

Licensee's Basis for Requesting Relief: The Licensee states that hydrostatic pressure tests as defined in Section XI are "Leakage Tests" and are not intended to test structural integrity. Performing a hydrostatic pressure test once during a 10-year interval provides a very small potential for increasing plant safety margins, while increasing expenditures, radiation exposure, critical path outage time, and manpower resources. Special valve lineups, relief valve gaging, and bypass jumpers are needed in order to perform a higher than normal operating pressure leak test. No additional benefit is gained by leak testing the system at an increased test pressure of 45 psig higher than nominal operating pressure.

Licensee's Proposed Alternative Examination: A system leakage test in accordance with ASME Code Case N-498 "Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division 1," will be performed in lieu of the Code-required hydrostatic tests. The alternative test requirements are as follows:

(1) A system leakage test (IWB-5221) will be conducted at the end of the inspection interval, prior to reactor startup.

(2) The boundary subject to test pressurization during the system leakage test will extend to all Class 1 pressure retaining components within the system boundary.

(3) Prior to performing the VT-2 visual examination, the system will be pressurized to nominal operating pressure for at least 4 hours for insulated systems and 10 minutes for noninsulated systems. The system will be maintained at nominal operating pressure during the performance of the VT-2 visual examination.

(4) Test temperatures and pressures will not exceed the limiting conditions for the hydrostatic test curve as contained in the Millstone, Unit 1 Technical Specifications.

(5) The VT-2 visual examination will include all components within the boundary identified in (2) above.

Evaluation: Examination Category B-P requires a system hydrostatic test per IWB-5222 of all Class 1 pressure retaining

components. The Licensee has proposed the use of Code Case N-498 in lieu of the Code requirements. Code Case N-498 has been approved for general use by reference in Revision 9 of Regulatory Guide (RG) 1.147 and, therefore, is an acceptable alternative to the Code-required system hydrostatic test.

Conclusions: Code Case N-498 has been approved for general use by reference in RG 1.147, Revision 9; therefore, relief is not required.

3.4.2 Class 2 System Pressure Tests

3.4.2.1 Request for Relief No. C-H-1 (Rev. 1), Examination Category C-H, Items C7.20, C7.40, C7.60 and C7.80, Class 2 Hydrostatic Pressure Tests

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H, Items C7.20, C7.40, C7.60 and C7.80, require a system hydrostatic test of the Class 2 pressure boundary, once per 10-year ISI interval, in accordance with IWC-5222.

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic test on pressure vessels, pumps and valves of the main steam, condensate, condensate booster feedwater, emergency condensate transfer, standby liquid control, low pressure coolant injection, core spray, isolation condenser, reactor shutdown cooling and scram systems.

Licensee's Basis for Requesting Relief: The Licensee states that: "hydrostatic pressure tests as defined in Section XI are 'Leakage Tests' and are not intended to test structural integrity". Performing a hydrostatic pressure test once during a 10-year interval provides a very small potential for increasing plant safety margins, while increasing expenditures, radiation exposure, critical path outage time, and manpower resources.

Performing a hydrostatic pressure test once in ten years on systems that are normally in-service continuously does not provide any added safety benefit. Hydrostatic pressure tests cause pump and valve packing leaks and pump seal maintenance by subjecting systems to pressures above their normal operating parameters. They also impact other work activities and become a critical path activity. Additionally, they are very time consuming and costly compared to the relatively small benefit achieved. Relief valves must be removed, blank flanged, or gagged. Staging must be built, then removed for relief valve work. Radiation exposure is increased from all these operations. Radwaste expenditures are increased when draining systems for relief valve removal before the test and draining again for the valve replacement after the test.

Licensee's Proposed Alternative Examination: A system leakage test in accordance with ASME Code Case N-498 "Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division 1," will be performed in lieu of the Code-required hydrostatic tests. The alternate test requirements are as follows:

(1) A system pressure test will be conducted during the third 10-year interval in the same inspection period when the last hydrostatic pressure test was completed during the previous 10-year interval (Millstone, Unit 1 ISI Program is in accordance with Inspection Program B).

(2) The boundary subject to test pressurization during the system pressure test will extend to all Class 2 components included in the portions of systems required to operate or support the safety system function up to and including the first normally closed valve (including a safety or relief valve) or valve capable of automatic closure when the safety function is required.

(3) Prior to performing the VT-2 visual examination, the system will be pressurized to nominal operating pressure for at least 4 hours for insulated systems and 10 minutes for noninsulated systems. The system will be maintained at nominal operating pressure during the performance of the VT-2 visual examination.

(4) The VT-2 visual examination will include all components within the boundary identified in (2) above.

In addition to the above, a system pressure test conducted during a system functional test or during a system inservice test will be performed each inspection period as required by Examination Category C-H.

Evaluation: Examination Category C-H requires a system hydrostatic test per IWC-5222 of all Class 2 pressure retaining components. The Licensee has proposed the use of Code Case N-498 in lieu of the Code requirements. Code Case N-498 has been approved for general use by reference in Revision 9 of Regulatory Guide (RG) 1.147 and, therefore is an acceptable alternative to the Code-required system hydrostatic test.

Conclusions: Code Case N-498 has been approved for general use by reference in RG 1.147, Revision 9; therefore, relief is not required.

3.4.2.2 Request for Relief No. C-H-2 (Rev. 1), Examination Category C-H, Items C7.40, Pressure Retaining Piping Penetrating Primary Containment

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H, item C7.40 requires a system hydrostatic test of the Class 2 pressure boundary, once per 10-year ISI interval, in accordance with IWC-5222.

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic pressure test and system pressure tests on the following Class 2 systems:

Station Air Supply to the Drywell;
Drywell Floor and Equipment Drain Sumps;
Drywell Demineralized Water Supply;

Transversing Incore Probe (TIP) and Nitrogen Purge Tubing;
Torus Pressure and Water Level Instrumentation; and
Drywell Nitrogen Compressor Suction and Discharge.

Licensee's Basis for Requesting Relief: The Licensee states that the subject systems should be considered an extension of the primary containment and should be exempt from Class 2 examination and pressure testing requirements. The systems are exempt from Class 2 nondestructive examinations because of size and pressure-temperature design exemptions, but not when applying all the rules and requirements of Section XI pressure testing and repair/replacement activities. The piping systems listed above, although classified as Class 2, are non-ECC systems that do not perform any safety related function other than containment boundary.

Licensee's Proposed Alternative Examination: A system leakage test in accordance with ASME Code Case N-498, "Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division 1," will be performed in lieu of the Code-required hydrostatic tests. The alternate test requirements are as follows:

(1) A system pressure test will be conducted during the third 10-year interval in the same inspection period when the last hydrostatic pressure test was completed during the previous 10-year interval (Millstone, Unit 1 ISI Program is in accordance with Inspection Program B).

(2) The boundary subject to test pressurization during the system pressure test will extend to all Class 2 components included in the portions of systems required to operate or support the safety system function up to and including the first normally closed valve (including a safety or relief valve) or valve capable of automatic closure when the safety function is required.

(3) Prior to performing the VT-2 visual examination, the system will be pressurized to nominal operating pressure for at least 4 hours for insulated systems and 10 minutes for non-insulated systems. The system will be maintained at nominal operating pressure during the performance of the VT-2 visual examination.

(4) The VT-2 visual examination will include all components within the boundary identified in (2) above.

In addition to the above, a system pressure test conducted during a system functional test or during a system inservice test will be performed each inspection period as required by Examination Category C-H.

Evaluation: Examination Category C-H requires a system hydrostatic test per IWC-5222 of all Class 2 pressure retaining components. The Licensee has proposed the use of Code Case N-498 in lieu of the Code requirements. Code Case N-498 has been approved for general use by reference in Revision 9 of Regulatory Guide (RG) 1.147 and, therefore, is an acceptable alternative to the Code-required system hydrostatic test.

Conclusions: Code Case N-498 has been approved for general use by reference in RG 1.147, Revision 9; therefore, relief is not required.

3.4.3 Class 3 System Pressure Tests

3.4.3.1 Request for Relief No. D-B-2, Examination Category D-B, Item D2.10, Hydrostatic Pressure Test on the Pressure Retaining Components of the Emergency Service Water (ESW) System

Note: As a result of the NRC request for additional information, Request for Relief No. D-B-2 was withdrawn by the Licensee in the November 5, 1991 submittal (Reference 6).

3.4.3.2 Request for Relief No. D-B-3, Examination Category D-B, Item D2.10, Reactor Building Closed Cooling Water (RBCCW) System

Note: As a result of the NRC request for additional information, Request for Relief No. D-B-3 was withdrawn by the Licensee in the November 5, 1991 submittal (Reference 6).

3.4.3.3 Request for Relief No. D-B-4, Examination Category D-B, Item D2.10, Turbine Building Secondary Closed Cooling Water (TBSCCW) System

Note: As a result of the NRC request for additional information, Request for Relief No. D-B-4 was withdrawn by the Licensee in the November 5, 1991 submittal (Reference 6).

3.4.3.4 Request for Relief No. D-B-5, Examination Category D-B, Pneumatic Pressure Test of Main Steam Automatic Pressure/Steam Relief Valve (APR/SRV) Discharge Piping into the Torus/Suppression Chamber

Code Requirement: Section XI, paragraph IWD-5223(f) of Article IWD-5000, states: "For safety or relief valve piping, which discharges into the containment pressure suppression pool, a pneumatic test (at a pressure of 90% of the pipe submergence head of water) that demonstrates leakage integrity shall be performed in lieu of system hydrostatic test."

Licensee's Code Relief Request: Relief is requested from performing the Code-required pneumatic pressure test per IWD-5223(f) for the APR/SRV discharge piping.

Licensee's Basis for Requesting Relief: The Licensee states that the open-ended discharge piping on the six APR/SRV is 10-inch Schedule 40 carbon steel. A pneumatic pressure test at 90% of pipe submergence head requires a test pressure of approximately 6 psig. The probability of detecting an air leak at the test

pressure is very small. There are no test connections installed on the piping to perform a pneumatic test.

Licensee's Proposed Alternative Examination: To confirm that an open flow path exists, each APR/SRV valve will be remote-manually actuated to discharge steam through the piping to the torus suppression chamber. The test will be performed every operating cycle.

Evaluation: Article IWD-5223(f) requires a pneumatic test at a pressure of 90% of submergence head, in lieu of the system hydrostatic test, for the subject piping system. As an alternative to the pneumatic test, the Licensee proposes that each valve will be manually actuated to release steam into the discharge piping every operating cycle to confirm an open flow path. The existing APR/SRV discharge piping is not equipped with the test connections necessary to perform the Code-required examination. Therefore, the Code requirement is impractical to perform. In order to perform the Code required examination, the subject system would require design modifications to install the necessary test connections. Imposition of the requirement on Millstone Nuclear Power Station, Unit 1 would cause a burden that would not be compensated by an increase in safety above that provided by the Licensee's proposed alternative.

Conclusions: It is concluded that the Code-required pneumatic test is impractical to perform at Millstone Nuclear Power Station, Unit 1. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.4.3.5 Request for Relief No. D-B-6, Examination Category D-B, Item D2.10, System Pressure Tests of the Standby Gas Treatment System

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B, Item D2.10, requires a hydrostatic pressure test (IWA-5000/IWD-5223) and a system functional test

(IWA-5000/IWD-5222), with associated VT-2 visual examinations for Class 3 pressure retaining components.

Licensee's Code Relief Request: Relief is requested from performing the Code-required "System Hydrostatic Test" and leakage tests during a "System Functional Test" on the standby gas treatment system pressure retaining components.

Licensee's Basis for Requesting Relief: The Licensee states that the standby gas treatment system is not designed to contain water and, therefore, cannot be leak tested with water as the fluid medium. The system is designed to filter and exhaust the reactor building atmosphere to the stack and also vent or purge the drywell air to the stack. The standby gas treatment units are not designed to receive positive air pressures. Plant operating procedures advise operations personnel not to vent the drywell or torus to the standby gas treatment system when a positive pressure is observed in the containment or torus. Millstone Unit 1 Technical Specification 4.7.B.1.A requires a system flow rate test to be performed once every operating cycle. The flow rate test verifies that the standby gas treatment unit's integrity is maintained by the ability to satisfactorily meet the design flow rate. Technical Specification 4.7.C.1.a requires a "Secondary Containment Tightness Test" to be performed prior to refueling or fuel movement. This test verifies that the inlet piping to the units and the outlet piping to the stack is intact by the ability of the system to perform its intended function by maintaining a 1/4 inch water vacuum in the secondary containment.

Licensee's Proposed Alternative Examination: The Licensee proposes to use the test requirements from Millstone Technical Specification 4.7.B.1.A in lieu of the Code-required examination, as stated below:

(1) A system flow rate test in accordance with Technical Specification 4.7.B.1.A, every operating cycle.

(2) A secondary containment tightness test every operating cycle prior to refueling or fuel movement.

Evaluation: Examination Category D-B, Item D2.10, requires a hydrostatic pressure test per IWA-5000/IWD-5223 and a system functional test per IWA-5000/IWD-5222, along with a VT-2 visual examination to detect leakage. As an alternative, the Licensee proposes a "System Flow Rate Test" every operating cycle and a "Secondary Containment Tightness Test" every operating cycle prior to refueling or fuel movement.

Paragraph IWD-5210(b), states that "The system hydrostatic test shall be conducted in accordance with IWA-5000, as applicable. The contained fluid in the system shall serve as the pressurizing medium." IWA-5211 states, in part, "The required system pressure tests and examinations, as referenced in Table IWA-5210-1, may be conducted in conjunction with one or more of the following system tests or operations: . . . (e) a system pneumatic test conducted in lieu of a hydrostatic pressure test for components within the scope of IWC and IWD." Therefore, it is not the intent of the Code to use water as the pressurizing medium in systems not designed to contain water. However, the subject system is not designed to receive positive air pressure; therefore, the Code-required system pressure tests are impractical to perform. In order to perform the Code-required examination, the subject system would have to be redesigned to accommodate the system pressure tests. Imposition of the requirement on Millstone Nuclear Power Station, Unit 1, would cause a burden that would not be compensated by an increase in safety above that provided by the proposed alternative examination.

Conclusions: It is concluded that the Code-required hydrostatic pressure test and functional tests are impractical to perform at Millstone Nuclear Power Station, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative examination in lieu of the Code requirements.

Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

3.4.3.6 Request for Relief No. D-C-1, Examination Category D-C, Item D3.10, Fuel Pool Cooling System Pressure Retaining Components

Note: As a result of the NRC request for additional information, Request for Relief No. D-C-1 was withdrawn by the Licensee in the November 5, 1991 submittal (Reference 6).

3.4.4 General (No relief requests)

3.5 General

3.5.1 Ultrasonic Examination Techniques (No relief requests)

3.5.2 Exempted Components (No relief requests)

3.5.3 Other

3.5.3.1 Request for Relief No. IWA-1, Subarticle IWA-2300(e), Qualifications of Nondestructive Examination Personnel

Code Requirement: Section XI, Paragraph IWA-2300(e) requires that nondestructive examination personnel for all methods shall be examined by qualified personnel to ensure that they have sufficient natural or corrected near-distance acuity, in at least one eye, to read the Jaeger Number 1 on a standard Jaeger test or a near-distance test pattern equivalent to a Snellen fraction of 20/20.

Licensee's Code Relief Request: Relief is requested to use the alternative near-distance vision test requirements of ASME Code Case N-490, "Alternative Vision Test Requirements for

Nondestructive Examiners, Section XI, Divisions 1, 2, and 3," in lieu of the Code requirements of Paragraph IWA-2300(e).

Licensee's Basis for Requesting Relief: The use of existing requirements will require nondestructive examination personnel with 20/25 near-distance visual acuity to have that acuity corrected in at least one eye. Requiring personnel to wear corrective lenses for such a small deviation of visual acuity is not recommended by ophthalmologists consulted by the Licensee.

Licensee's Proposed Alternative Examination: The Licensee proposes to follow the requirements of Code Case N-490 in lieu of the Code requirements. Code Case N-490 requires that personnel must demonstrate natural or corrected near-distance acuity, for at least one eye, by reading words or identifying characters on a near-distance test chart. For the selected type size, the height of lower case characters, without ascenders or descenders (e.g. a, c, e, o) shall subtend no more that a 6.25 minute angle (Snellen 20/25 fraction) with the eye at selected distances.

Evaluation: Subarticle IWA-2300(e), requires that nondestructive examination personnel for all methods must demonstrate sufficient near-distance acuity in at least one eye, as determined by the ability to read the Jaeger Number 1 on a standard Jaeger test, or a near-distance test pattern equivalent to a Snellen fraction of 20/20. The Licensee proposes to use the requirements of Code Case N-490 in lieu of the current Code requirement.

The current Code requirement allows too much latitude in how near-distance acuity is determined, resulting in excessive variation in the results. The Code requirement allows either the Jaeger J1, or Snellen fraction 20/20. However, Jaeger charts have been found to vary (Reference 14), which results in inconsistent near-distance acuity determinations. Code Case N-490, and Code changes that have been approved by the Section XI subcommittee and will be incorporated into future editions and addenda of the Code, provide the requirements to

eliminate the potential variations. These requirements are that personnel shall demonstrate natural or corrected near-distance acuity in at least one eye of Snellen fraction 20/25 or better. In addition, at least one character on the eye chart must be measured before initial use with an optical comparator (10X or greater) or other suitable instrument, to verify that the height of a representative lower case character (without an ascender or descender) for the selected type size, meets the requirements of Table 1 (provided in the Code Case).

The proposed alternative to use Code Case N-490 will eliminate the variability of the current Code requirement and, therefore, will provide an acceptable level of quality and safety in lieu of the Code requirement.

Conclusions: Based on the above evaluation and pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the Licensee's proposed alternative be authorized.

3.5.3.2 Request for Relief No. IWF-1, Examination Categories F-A, F-B and F-C, Items F1.10 through F3.50, Component Supports

Code Requirement: Section XI, Table IWF-2500-1, Examination Categories F-A, F-B and F-C, Items F1.10 through F3.50 require VT-3 visual examination of component supports as defined by Figure IWF-1300-1.

Licensee's Code Relief Request: Relief is requested to use the alternative requirements for component supports provided under ASME Code Case N-491, "Alternative Rules for Examination of Class 1, 2, 3, and MC Component Supports of Light-Water Cooled Power Plants, Section XI, Division 1".

Licensee's Basis for Requesting Relief: The Licensee states that the existing requirements do not clearly define the number of components supports that are required to be examined during an

inspection interval. There is no defined selection sample for component supports in Subsection IWF. Only parts of supports are required for examination. No exemption criteria exist. No requirements are provided for a preservice examination when supports are adjusted, repaired or replaced. The additional examinations provided in subsection IWF have no relationship to the failure modes that require the corrective measure to be taken. Millstone Nuclear Power Station, Unit 1 believes that Code Case N-491 is the best alternative available to provide requirements in the areas that do not exist under Subsection IWF.

Licensee's Proposed Alternative Examination: The requirements provided under ASME Code Case N-491 include a minimum of 25% of Class 1 piping supports, a minimum of 15% of Class 2 piping supports, and a minimum of 10% of Class 3 piping supports. The total percentage sample will be comprised of supports from each system (e.g. main steam, feedwater, or RHR), where the individual sample sizes are proportional to the total number of nonexempt supports of each type and function within a system. For multiple supports other than piping within a system of similar design, function, and service, the supports of only one of the multiple components will be examined.

Evaluation: The Licensee proposes to use Code Case N-491 in lieu of the Code required selection criteria. In Enclosure 4 of the November 5, 1991 submittal (Reference 6), the Licensee included a comparison of the component supports selected by IWF of the 1986 Code versus Code Case N-491. The enclosure shows that the Code Case meets the minimum sample size of the Code and, therefore, provides an acceptable level of quality and safety in lieu of the Code requirement.

Conclusions: Based on the above evaluation and pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that the proposed alternative be authorized provided that the Licensee meets all the requirements of Code Case N-491.

3.5.3.3 Request for Relief No. IWF-2, Subarticle IWF-5400, Mechanical and Hydraulic Snubbers Functional Test

Note: As stated previously, inservice test (IST) programs are being evaluated in other reports. Therefore, Request for Relief No. IWF-2 is not evaluated in this report. It should also be noted that the subject of this relief request was previously evaluated as part of the Millstone Nuclear Power Station, Unit 1, Technical Specification in an NRC Safety Evaluation Report dated March 17, 1988.

4. CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6)(i), it has been determined that certain inservice examinations cannot be performed to the extent required by Section XI of the ASME Code. In those cases where the Licensee has demonstrated that specific Section XI requirements are impractical, it is recommended that relief be granted. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee, that could result if the requirements were imposed on the facility.

Pursuant to 10 CFR 50.55a(a)(3), it is concluded that in certain cases, the Licensee's proposed alternative provides an acceptable level of quality and safety in lieu of the Code required examination. In those cases, it is recommended that the proposed alternative be authorized.

For Requests for Relief B-A-1 (Rev. 1), B-G-1-1, B-G-2-1, C-C-1 (Rev. 1), and IWC-1, it is concluded that the Licensee has not provided information to support the determination that the Code requirement is impractical, and that requiring the Licensee to comply with the Code requirement would not result in hardship. Requests for Relief D-B-2, D-B-3, D-B-4, and D-C-1 were withdrawn by the Licensee and deleted from the ISI Program Plan. For Requests for Relief B-P-1, C-H-1, and C-H-2, it was concluded that relief was not required.

This technical evaluation has not identified any practical method by which the Licensee can meet all the specific inservice inspection requirements of Section XI of the ASME Code for the existing Millstone Nuclear Power Station, Unit 1, facility. Compliance with all the exact Section XI required inspections would necessitate redesign of a significant number of plant systems, sufficient replacement components to be obtained, installation of the new components, and a baseline examination of these components. Even after the redesign efforts, complete compliance with the Section XI examination requirements probably could not be achieved. Therefore, it is concluded that the public interest is not served by imposing certain provisions of Section XI of the ASME Code that have been determined to be impractical. Pursuant to 10 CFR 50.55a(g)(6), relief is allowed from the requirements that are impractical to implement, or alternatively, pursuant to 10 CFR 50.55a(a)(3),

alternatives to the Code-required examinations may be authorized provided that either (i) the proposed alternatives provide an acceptable level of quality and safety or that (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety.

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

Based on the review of the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan*, the Licensee's response to the NRC's RAI, and the recommendations for granting relief from the ISI examination requirements that have been determined to be impractical, it is recommended that the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan* be considered unacceptable and not in compliance with 10 CFR 50.55a(g)(4), until the issues described in MEB 3-1 (see Section 2.2.4 of this report) are addressed.

5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.

2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:

   1986 Edition
   1974 Edition through Summer 1975 Addenda

3. *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan*, dated December 14, 1990.

4. NUREG-0800, *Standard Review Plan*, Section 5.2.4, "Reactor Coolant Boundary Inservice Inspection and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components," July 1981.

5. Letter, dated September 3, 1991, D. H. Jaffee (NRC) to E. J. Mroczka (Northeast Utilities), containing request for additional information on the ISI Program and Plan.

6. Letter, dated November 5, 1991, J. F. Opeka (Northeast Utilities), to Document Control Desk (NRC), containing response to the NRC's September 3, 1991 request for additional information.

7. Letter, dated March 30, 1992, E. A. DeBarba (Northeast Utilities), to Document Control Desk (NRC), containing response to NRC concerns discussed during conference calls of January 17, 1992, January 20, 1992, and February 25, 1992.

8 NRC Generic Letter 88-01, *NRC Position on Intergranular Stress Corrosion Cracking in BWR Austenitic Stainless Steel Piping*, January 25, 1988.

9. NUREG-0313, *Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping*, Revision 2, January 1988.

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

11. NUREG-0619, *BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking*, November 1980.

12. NUREG-0803, *Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping*, August 1981.

13. IEB 80-13, *Cracking in Core Spray Spargers*, April 4, 1980.

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This report presents the results of the evaluation of the *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection (ISI) Program Plan*, submitted December 14, 1990, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the Licensee has determined to be impractical. The *Millstone Nuclear Power Station, Unit 1, Third 10-Year Interval Inservice Inspection Program Plan* is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the Nuclear Regulatory Commission (NRC) review. The requests for relief are evaluated in Section 3 of this report.

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

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