

Duke Power Company
McGuire Nuclear Generation Department
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DUKE POWER

September 21, 1994

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: McGuire Nuclear Station
McGuire Nuclear Station, Unit 1
Docket No. 50-369
ASME B&PV Code, Section XI, 1986 Edition
Hydrostatic Testing
Relief Request 94-009

Dear Sir:

Pursuant to 10 CFR50.55a (g) (5) (iii), I am submitting the attached relief requests for NRC review and approval. These requests for relief involve the 1986 edition of the ASME B&PV Code, Section XI, Articles IWA-5214 (Repairs and Replacement) and IWC-5222 (System Hydrostatic Tests). The requests seek approval for the use of root pass Dye Penetrant examination coupled with inservice testing at normal operating pressure and temperature in lieu of the hydrostatic testing normally required after the replacement of pressure retaining components. The attached details two requests for relief, one for 1SM-83 and 1SM-95 and one for 1NI159. To facilitate your review regarding 1SM-83 and 1SM-95, please find enclosed a copy of the Safety Evaluation for Relief Request (RR) 91-02. In similar fashion, RR 91-02 sought relief from hydrostatic testing involving a number of 6 inch nozzle welds and the weld associated with the inlet of valve 1SM89.

In support of entry into 1BOC10/Mode 4, NRC staff approval of this matter is requested by October 1, 1994. Furthermore, we request that the subject request approval be forwarded via FAX number (704) 875-4165, attention: J. E. Snyder Manager, Regulatory Compliance, when review and approval is complete.

Should there be any questions regarding this matter, please contact J. E. Snyder at (704) 875-4447.

Very truly yours,

T. C. McMeekin

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U.S. Nuclear Regulatory Commission
September 21, 1994
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Administrator, Region II
U.S. Nuclear Regulatory Commission
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Atlanta, Ga. 30323

Mr. Victor Nerses
U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555

Mr. George Maxwell
Senior NRC Resident Inspector, McGuire
McGuire Nuclear Station

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bx: with attachments

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File: 801.01
ELL (EC050)

DUKE POWER COMPANY
Request for Relief From
Inservice Inspection Requirement

Station: McGuire Nuclear Station

Unit: 1

Reference Code: ASME B&PV Code Section XI, 1986 Edition

I. Component for which exemption is requested:

a. Name and Identification Number:

1/ Socket weld number SM1F386 (associated with the inlet of 2" valve 1SM83, Main Steam line A drain isolation) and 2/ socket weld number SM1F457 (associated with the inlet of valve 1SM95, Main Steam line C drain isolation).

b. Function:

Both valves function to isolate the extraction flow from the 34 inch Main Steam piping to the condenser.

c. ASME Section XI Code Class:

None

d. Construction Code and Class :

ASME B&PV Code Section III, Class 2

e. Valve Category:

Not Applicable

f. Attachments:

1 Copy of November 22, 1991 Notice of Approval for Relief Request 91-02 (Previous relief from hydrostatic testing a number of 6 inch nozzle welds and weld number SM1F386 associated with the inlet of valve 1SM83.

II. Reference Code Requirement from which relief is desired:

ASME B&PV Code Section XI, 1986 Edition, Articles IWA-5214 (Repairs and Replacements) and IWC-5222.

III. Basis for Requesting Relief:

Valves 1SM83, Steam line A drain isolation and 1SM95, Steam line C isolation are 2 inch air operated Y-type Kerotest globe valves. The inlet of each valve is constructed to ASME Class 2 requirements while the outlet of each is constructed to ANSI B31.1 specifications. The valves perform no throttling functions. The valve operators fail open.

Each valve is the first valve off of a 34 inch Main Steam Line. The 2 inch branch connections are located between the Steam Generators and Main Steam Header. The valves are physically located in the Unit 1 Dog House just exterior to the Containment Building.

Each valve was scheduled for valve operator maintenance during the End of Cycle 9 Outage (1EOC9). While coupling the operators to the valves, binding of the valve stems was discovered by maintenance personnel.

Upon disassembly of valve 1SM83, the body seats were found to be damaged and disassembly of valve 1SM95, revealed the yoke and body threads were galled together. The damage to each valve could not be repaired.

Each valve was replaced and a Dye Penetrant examination was performed on the root pass of each weld. A hydrostatic test in accordance with IWA-5214 is now required.

At no point during the planning of these maintenance activities could station personnel credibly determined/predicted that an exigent Request for Relief from hydrostatic testing would be required.

Performing hydrostatic tests at 1481 psig on the socket welds on the upstream sides of valves 1SM83 and 1SM95 are impractical for the following reasons:

- 1) The pressure tests would require pressurizing the Steam Generators 1A and 1C. This would require a significant amount additional work and an increase in personnel radiation exposure.
- 2) The pressure tests could potentially damage the steam generators and their internal components.
- 3) The pressure tests could significantly affect other planned outage maintenance activities and possibly extend the overall outage length.

- 4) The use of alternate pressure test boundaries such as freeze seals or hydro plugs is not feasible due to the close proximity of the valves to the main steam headers and the existing physical barriers with the replacement valves internals.

IV. Alternate Examination:

In lieu of the hydrostatic test, the following alternative inspections will (have been) be performed in addition to (a) ASME Code required final Dye Penetrant or Magnetic Particle testing and (b) ASME Code required final visual inspection:

1. The root pass of each socket weld will be (was) subjected to a Dye Penetrant test.
2. Each socket weld will be subject to an inservice test at normal operating pressure and temperature to verify that the welds do not leak at normal system temperature and pressure.

The above Alternative Examinations are comparable to the required hydrostatic testing for identifying defects in 2 inch socket welds; therefore, the level of quality and safety of the welds will in no way be reduced.

Historically McGuire Nuclear Station has successfully utilized alternative Non Destructive Examination methods in lieu of hydrostatic testing and have experienced no weld failures related to those events.

V. Implementation Schedule:

The alternative examinations will be applied during the 1EOC9 refueling outage during the month of September 1994. This Request for Relief applies only to this particular replacement of valves 1SM83 and 1SM95 and will not be applied to any future repairs or replacements associated with these valves.

The NRC approval of this proposal is requested by October 1, 1994. This date is just prior to McGuire Unit 1 entering Mode 4 at the end of outage 1EOC9.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
November 22, 1991

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Docket Nos. 50-369
and 50-270

Mr. T. C. McMeekin
Vice President, McGuire Site
Duke Power Company
12700 Hagers Ferry Road
Huntersville, North Carolina 28078-8985

Dear Mr. McMeekin:

SUBJECT: SAFETY EVALUATION ON RELIEF REQUEST NO. 91-02 (TAC NOS. 81529/81530)

By letter dated September 4, 1991, Duke Power Company (DPC) requested relief from ASME Code Section XI regarding the performance of a pressure test following modifications to replace the currently butt-welded nozzle configuration with a flanged configuration for the nozzles upstream of the main steam code safety valves. The nuclear station modifications (NSM) associated with this relief request are NSM's MG-12302, MG-12303, MG-12304, MG-12305, MG-22302, MG-22304, and MG-22305.

The NRC staff with the assistance of our contractor has reviewed and evaluated Relief Request 91-02. Enclosed is our Safety Evaluation wherein we conclude that the hydrostatic testing requirements of Section XI of the Code are impractical to perform at McGuire Nuclear Station Units 1 and 2 following the subject modifications. The proposed alternative examinations are acceptable as discussed in the Safety Evaluation and are imposed in lieu of the applicable Code requirements. Accordingly, relief is granted as requested, pursuant to 10 CFR 50.55a(g)(6)(i). This relief is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on your facility.

This concludes our review activities in response to your submittal regarding Relief Request 91-02 addressed by TAC numbers 81529/81530.

Sincerely,

Handwritten signature: David J. Lange, for
David B. Matthews, Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
Safety Evaluation

cc w/enclosure:
See next page

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE FIRST TEN-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF NO. 91-02

FOR

DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2,

DOCKET NOS 50-369 AND 50-370

1.0 INTRODUCTION

The Technical Specifications for McGuire Nuclear Station, Units 1 and 2, state that the surveillance requirements for Inservice Inspection and Testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Title 10 of CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used if (1) the proposed alternatives would provide an acceptable level of quality or safety, or (2) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first ten-year interval comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) on the date twelve months prior to the date of issuance of the operating license, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the McGuire Nuclear Station, Units 1 and 2, first 10-year inservice inspection (ISI) interval is the 1980 Edition, through Winter 1980 Addenda. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein.

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Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for his facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(f), the Commission 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.

In a letter dated September 4, 1991 the licensee, Duke Power Company, submitted Request for Relief No. 91-02, asking for relief from the pressure testing requirements of subarticle IWA-4400.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of Request for Relief No. 91-02 as follows:

Request for Relief No. 91-02, Subarticle IWA-4400, Pressure Testing After Repair Procedures

Code Requirement: Subarticle IWA-4400(a), states that: "After repairs by welding on the pressure retaining boundary, a system pressure test shall be performed in accordance with IWA-5000." IWA-5000 refers to IWC-5000 for the required test conditions for Class 2 systems, where IWC-5222(a) states that the system hydrostatic test pressure shall be at least $1.10 P_{SV}$ (system pressure) for systems with design temperatures of 200 degrees F, or less, and at least 1.25 times P_{SV} for systems above 200 degrees F.

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic pressure tests for repair welds on five 6" nozzles for each main steam system header (20 nozzle welds per unit) upstream from the main steam safety valve and a weld on the 2" drain line upstream from valve 1SM89 on steam generator 1B steam header.

Licensee's Basis for Requesting Relief: The nozzles on existing valves have eroded to near the point where Crosby (the valve vendor) cannot ensure proper operation. Therefore, the licensee has scheduled replacement of "the existing butt-welded Crosby valves with welded-in nozzles with flanged Crosby valves with screwed-in nozzles." The licensee states that performing pressure tests on the nozzle welds upstream from the main steam safety valves and the weld on the upstream side of valve 1SM89 is impractical for the following reasons:

- (a) The pressure tests would require pressurizing the associated steam generators, which would require approximately 200 workhours per steam generator, some personnel radiation exposure, and procurement of a large capacity hydro test pump.

- (b) The pressure test could potentially damage the steam generator and its internal components.
- (c) The pressure test could significantly affect other planned outage maintenance activities and possibly extend the overall outage length.
- (d) Alternative pressure testing methods using freeze plugs or hydro plugs are not feasible due to the close proximity of the nozzles and valve to the main steam headers, the conical shape of the nozzles and the physical barrier that the valve internals present.

Licensee's Proposed Alternative Examination: The butt welds on the 6" nozzles upstream of the ASME Code safety valves shall be subjected to a surface examination on the root pass, and surface and volumetric examinations of the finished welds. The socket weld on the upstream side of valve 1SM89 shall be subjected to a surface examination of the root pass and the finished weld. In addition, an inservice leak test shall be performed at normal system operating temperature and pressure for both the butt welds and socket weld.

The scheduled implementation dates are as follows:

<u>Unit #</u>	<u>Outage Date</u>	<u>Modification</u>
1	<i>do not clear up tabular data</i>	02 1E0C8
1		03 1E0C7
1		04 1E0C7
1		05 1E0C8
1		371 1E0C7
2		32 2E0C8
2		33 2E0C7
2		34 2E0C7
2		35 2E0C8
2		36 2E0C8

Staff Evaluation: Subarticle IWA-4400(a) states that a hydrostatic pressure test shall be performed in accordance with IWA-5000 for repairs by welding that penetrate the pressure boundary. A hydro-static pressure test is required for each welded repair. Since, the welded repairs cannot be isolated from the affected lines, the steam generators would also see the hydrostatic test pressure each time a repair is performed. In addition, the steam generators would be subjected to stress cycles that were not accounted for in their design. Therefore, the Code requirement is impractical. Imposition of the requirement on Duke Power Company would cause a burden that would not be compensated by an increase in safety above that provided by the proposed alternatives.

The licensee's proposed alternatives include a volumetric examination of the butt welds on the 6" nozzles and a surface examination of the socket weld on valve 1SM89. Surface examination on the root pass of all welds and an in-service leak test of the repair welds at normal operating temperatures and pressures will also be performed.

Considering the burden placed on the licensee by imposition of the code requirements and the assurance of structural integrity of the welds provided by the licensee's proposed alternatives, the staff concludes that relief may be granted as requested.

3.0 CONCLUSION

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee determined that conformance with certain Code requirements is impractical for his facility and submitted supporting information. Pursuant to 10 CFR 50.55a(g)(6)(i), the NRC staff concludes that the Code requirement is impractical to perform and that relief may be granted as requested for the refueling outages listed in Relief Request 91-02. Such relief is authorized by law and will not endanger life, property, or the common defence and security, and is otherwise in the public interest. The relief has been granted giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Date: November 22, 1991

DUKE POWER COMPANY
Request for Relief From
Inservice Inspection Requirement

Station: McGuire Nuclear Station

Unit: 1

Reference Code: ASME B&PV Code Section XI, 1986 Edition

I. Component for which exemption is requested:

a. Names and Identification Numbers:

- 1) Weld number NI1F2023 located on the outlet of check valve 1NI159 (Safety Injection Pump 1B to Hot Leg Loop 4). This socket weld joins the valve discharge to 2 inch piping.
- 2) Weld number NI1FW35-1 is the next 2 inch socket weld downstream of item 1 above. This weld joins the 2 inch pipe to a full coupling.
- 3) Weld number NI1FW35-2 is the next 2 inch socket weld downstream of item 2 above. This weld joins the full coupling to the 2 inch pipe.

b. Function:

The function of 1NI159 (a 2 NPS check valve) is to allow flow from Safety Injection (SI) Pump 1B to the Reactor Coolant Loop 4 (Hot Leg). Just prior to flow entering the Reactor Coolant Loop, two check valves are positioned in series. Valve 1NI159 is the second check valve from the Reactor Coolant Loop. No isolation valves exist between valve 1NI159 and the Reactor Coolant Loop.

c. ASME Section XI Code Class:

None

d. Construction Code and Class (If Applicable):

ASME B&PV Code Section III, Class 1

e. Valve Category(If Applicable):

Not Applicable

f. Attachments (list) or References:

None

II. Reference Code Requirement from which relief is desired:

ASME B&PV Code Section XI, 1986 Edition, Articles IWA-5214 (Repairs and Replacements) and IWB-5222.

III. Basis for Requesting Relief:

Valve 1NI159 was suspected of leakage past the seat prior to the End of Cycle 9 (1EOC9) Outage. As with other check valve seat leaks, the maintenance plan prior to the outage was to repair the seating surfaces (not replace the valve). At no point during the planning of these maintenance activities could station personnel credibly determined/predicted that a Request for Relief from hydrostatic testing would be required.

Performing hydrostatic tests on the socket welds on the downstream sides of valve 1N1159 is impractical. Hydrostatic test pressures are determined per Table IWB-5222-1 (TEST PRESSURE). Test Pressure (at the appropriate Test Temperature) is achieved using the Reactor Coolant Pumps. There is a check valve (1N1160) between valve 1N1159 and the Reactor Coolant Loop which prevents flow and pressure from exiting the Reactor Coolant Loop. Therefore the discharge side of valve 1N1159 is not affected by the reactor coolant fluid at Test Pressure and Test Temperature.

An alternative method of obtaining the Test Pressure on the discharge side of valve 1N1159 was considered. While the Reactor Coolant Loop would be at Test Pressure and Test Temperature, connect a hydrostatic test pump to a high point vent which could inject fluid at the Test Pressure between valve 1N1159 and 1N1160. The flaw with this alternative test method would be that the fluid for the hydrostatic test would not be at the Test Temperature (per Table IWB-522-1).

IV. Alternate Examination:

In lieu of the hydrostatic test the following alternative inspections will be performed in addition to ASME Code required final liquid penetrant test (PT) and ASME Code required final visual inspection (VT).

1. The root pass of each socket weld was subjected to a liquid penetrant test (PT).
2. Each socket weld will be subject to an inservice test at normal operating pressure and temperature.

It is Duke's position that the Alternative Examinations are comparable to hydrostatic testing for finding defects in 2 inch socket welds and that the level of quality and safety of the welds will be in no way reduced.

Historically McGuire Nuclear Station has successfully utilized alternative NDE in lieu of hydrostatic testing on numerous occasions and have not experienced any weld failures related to those events.

V. Implementation Schedule:

The alternative examinations has been or will be applied during 1EOC9 during the month of September 1994. This Request for Relief applies only to this particular replacement of valve 1N1159. This Request for Relief will not be applied for any future repairs or replacements associated with this valve.

The NRC is asked to approve or disapprove this relief request by October 1, 1994. This date is just prior to McGuire Unit 1 entering Mode 4 at the end of outage 1EOC9.