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REPLY TO
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August 13, 1997
BVY 97-104

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

References: (a) License No. DPR-28 (Docket No. 50-271)
(b) Letter, VYNPC to USNRC, BVY 96-163, dated December 19, 1996
(c) Telecon, USNRC to VYNPC, dated March 28, 1997
(d) Telecon, USNRC to VYNPC, dated May 1, 1997

Subject: Vermont Yankee Inservice Test Program - Revision 18

In References (c) and (d) the NRC requested additional information regarding the relief requests and cold shutdown justifications submitted to NRC in Reference (b). The purpose of this letter is to provide this information to NRC. In addition, this letter transmits an additional relief request, RR-V15, prepared after submittal of Reference (b).

Attachment A provides a summary of changes made to Reference (b). Also, as requested in Reference (d), we have provided Vermont Yankee drawing G-191160, sheet 3 of 8, to assist in your review.

Vermont Yankee makes no new commitments with this letter.

We trust that this submittal provides sufficient information for your review. However, if additional information is required, please contact this office.

Sincerely,
VERMONT YANKEE NUCLEAR POWER CORPORATION

James J. Duffy
Licensing Engineer

190093

A047

c: USNRC Region 1 Administrator
USNRC Resident Inspector -VYNPS
USNRC Project Manager - VYNPS

Drawings located in Control Files

Summary of Changes
Vermont Yankee's Inservice Test Program, Revision 18

Below are changes made to Vermont Yankee's December 1996 submittal:

Relief Request RRV-12, Revision 1

- Open capability test method for V70-43A & B has been added to the component description.
- The "Request for Relief" section was rewritten to clarify the impracticability of full stroke exercising these valves in the closed direction during normal power operations. Discussion of the impracticability of testing the Alternate Cooling mode of operation was also clarified.
- The "Alternate Test Method" was revised to propose disassembly and inspection or radiography of each valve on an operating cycle frequency.

Relief Request RR-V13, Revision 0

- The "Request for Relief" section was rewritten to clarify the burden of performing radiography on a quarterly basis for these valves.
- The "Alternate Test Method" was rewritten to propose non-intrusive testing (radiography) of each valve on an operating cycle frequency instead of on a quarterly basis.

Relief Request RR-V14, Revision 0

- The "Request for Relief" section was rewritten to clarify the burden of performing radiography on a quarterly basis for these valves.
- The "Alternate Test Method" was rewritten to propose non-intrusive testing (radiography) of each valve on an operating cycle frequency instead of on a quarterly basis.

Relief Request RR-V15, Revision 0

In addition to the above requested revisions and clarifications, Vermont Yankee is submitting Relief Request RR-V15, Revision 0, which was not submitted in Reference (b). The relief request proposes testing the RCIC pump and HPCI pump suction check valves from the Condensate Storage Tank by non-intrusive testing (radiography) on an operating cycle frequency. These valves had been previously tested by quarterly non-intrusive testing (radiography) as a commitment made by Vermont Yankee in LER 96-01, corrective action #3. The newly proposed non-intrusive testing (radiography) will supersede the LER 96-01 commitment upon approval.

Cold Shutdown Justification CSJ-V17, Revision 0

This "Justification" section was revised to provide greater clarification regarding the burden of testing V72-28A, V72-28B, V72-28D and V72-28E during power operation.

Relief Requests RR-P03, RR-P05, RR-P06

Reference (b) contained minor changes to pump relief requests RR-P03, RR-P05, and RR-P06 that were not noted in our cover letter. Specifically, the instrument accuracy values used in these relief requests had been revised to reflect the closer tolerances now in use at Vermont Yankee. These changes are summarized below:

RR-P03, RR-P05, RR-P06: Summary of Instrument Accuracy Changes

	Revision 17			Revision 18		
Relief Request	Calibrated Accuracy	Measured Inaccuracy	ΔP Error	Calibrated Accuracy	Measured Accuracy	Δ Error
RR-P03	± 1.58%	± 1.34 psi	± 0.12%	± 1.17%	± 0.99 psi	± 0.08%
RR-P05	± 2.0%	± 1.2 psi	± 0.5%	± 1.6%	± 0.96 psi	± 0.41%
RR-P06	± 1.58%	± 1.34 psi	± 0.12%	± 1.17%	± 0.99 psi	± 0.09%

RELIEF REQUEST

Number: RR-V12, Revision 1 (Sheet 1 of 3)

SYSTEM: Service Water System(SW)

COMPONENTS:

Valve Number	OM Cat.	Safety Class	Drawing Number	Dwg. Coord.
V70-43A	C	3	G-191159 Sh 1	J-12
V70-43B	C	3	G-191159 Sh 1	B-12

These valves are the Service Water System loop header discharge check valves. These valves have a safety function to open to provide cooling water flow from the Service Water pumps to various ECCS area coolers and the emergency diesel generator coolers required to operate during normal operating conditions. Open capability of these check valves is demonstrated quarterly by verifying that the V70-43A & V70-43B design flow rate is measured through the emergency diesel generator heat exchangers.

These valves also have a safety function to close during the alternate cooling mode of operation of the SW system. When the SW system is operating in the alternate cooling mode, these valves close to ensure adequate Residual Heat Removal Service Water (RHRSW) pump flow is directed to the RHR heat exchangers, ECCS area coolers and the emergency diesel generator heat exchangers.

EXAM OR TEST CATEGORY:

Category C

CODE REQUIREMENT: Part 10

Para. 4.3.2.1 "Exercising Tests for Check Valves"

"Check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5.

REQUEST FOR RELIEF:

Relief is requested on the basis that full stroke exercising for these valves in the closed direction on a 3 month, cold shutdown or refuel outage basis in accordance with OM-10, Para. 4.3.2.1 is impractical and does not provide a compensating increase in safety. The proposed alternative testing will provide an acceptable level of quality and safety.

RELIEF REQUEST

Number: RR-V12, Revision 1 (Sheet 2 of 3)

REQUEST FOR RELIEF(CONT.):

These valves are Safety Class 3 eight inch swing check valves located in the RHRSW pump bypass lines which supply various ECCS area coolers and the emergency diesel generator heat exchangers during normal plant operations. During the SW system Alternate Cooling mode of operation these check valves close to prevent diversion of RHRSW flow away from essential systems and components.

During normal SW system operation:

1) The RHRSW pumps rely on the operation of the SW pumps to supply required pump suction pressure.

2) Positive closure verification of these valves cannot be assured since RHRSW pump discharge pressure is throttled to support system operating requirements, the differential pressure across V70-43A(B) is low and gross leakage past the valve could be masked by the constant upstream pressure supplied by the SW pumps.

3) The flow path through PCV-104-69A(B) is not available because the manual isolation valves, V70-42A(B), are administratively closed to prevent the overpressurization of the emergency diesel generator heat exchangers. This flow path is used only during the Alternate Cooling mode of operation to supply cooling water to the emergency diesel generator heat exchangers and ECCS area coolers.

It is impracticable to full stroke exercise these valves in the closed direction on a quarterly, cold shutdown or refuel outage basis unless the SW system is operated in the Alternate Cooling mode or SW flow is isolated to the emergency diesel generator heat exchangers and ECCS area coolers.

During the Alternate Cooling mode of SW operation:

1) The Alternate Cooling mode of operation is designed as an alternate means of providing service water to safety systems in the event of:
   a) a fire in the intake structure,
   b) loss of the Vernon Dam coincident with a loss of site electrical power and,
   c) flooding of the SW Intake Structure.

RELIEF REQUEST

Number: RR-V12, Revision 1 (Sheet 3 of 3)

REQUEST FOR RELIEF(CONT.):

2) In accordance with station procedures, some the actions that are required before the Alternate Cooling Subsystem can be started are as follows:
   a) The reactor must be manually scrammed or be shutdown.
   b) The operating Control Rod Drive Pump must be secured.
   c) All Residual Heat Removal Pumps must be placed in the Pull-to-Lock position.
   d) All Service Water Pumps in the subject train must be secured.
   e) The SW system be manually re-aligned to take suction off of the cooling tower basin

There has been no specific frequency for placing the alternate cooling system into service due to the heat exchanger capability testing requirements of USNRC Generic Letter 89-13 "Service Water System Problems Affecting Safety Related Equipment". Therefore, periodic verification of valve closure utilizing RHRSW pump pressure in the Alternate Cooling flow mode of operation is not practical on a quarterly, cold shutdown or every refueling outage basis.

As identified in Vermont Yankee SER dated 07/27/95 (NVY 95-100), it is practical to verify the condition of these valves by the use of non-intrusive techniques (radiography). However, these valves will continue to be disassembled and inspected on a routine basis for verification of system coating integrity, system cleaning and satisfaction of LER 89-017, corrective action #2.

ALTERNATE TEST METHOD:

These check valves are of simple design, operate under mild service conditions and the maintenance history for these valves indicates that they have not been susceptible to recent service induced failures or significant wear. Vermont Yankee proposes to perform non-intrusive testing (radiography) or disassembly and inspection on each check valve once each operating cycle to verify valve closure capability. For those valves which are disassembled and inspected in accordance with a plant planned maintenance program, that disassembly and inspection will be performed in lieu of non-intrusive testing for that valve for that operating cycle.

During the disassembly, the internals of the valve will be verified to be structurally sound (no loose or corroded parts). If the disassembled valve is not capable of being full-stroke exercised or there is binding or failure of the valve internals, the other valve will also be disassembled, inspected and manually exercised during the same operating cycle.

USNRC EVALUATION STATUS

Relief was granted in the July, 1995 SER [Reference (x)] for Relief Request RR-V12.

RELIEF REQUEST

Number: RR-V13, Revision 0 (Sheet 1 of 3)

SYSTEM: Residual Heat Removal (RHR)
Core Spray (CS)
Reactor Core Isolation Cooling (RCIC)
High Pressure Coolant Injection (HPCI)

COMPONENTS:

Valve Number	OM Cat.	Safety Class	Drawing Number	Dwg. Coord.
V10-36A	C	2	G-191172	J-03
V10-36B	C	2	G-191172	J-14
V14-33A	C	2	G-191168	H-11
V14-33B	C	2	G-191168	H-15
V23-20B	C	2	G-191169 Sh 1	G-07
V13-20B	C	2	G-191174 Sh 1	G-11

These valves are the Residual Heat Removal, Core Spray, High Pressure Coolant Injection and Reactor Core Isolation Cooling system keep-fill check valves. These valves have a safety function to close to isolate Safety Class 2 CS, RHR, RCIC or HPCI piping from the lower pressure non-safety grade Condensate Transfer System piping in the event of a system actuation.

EXAM OR TEST CATEGORY:

Category C

CODE REQUIREMENT: Part 10

Para. 4.3.2.1 "Exercising Test Frequency"

"Check valves shall be exercised nominally every 3 months, except as provided by paras. 4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5."

REQUEST FOR RELIEF:

Relief is requested on the basis that individual full stroke exercise testing in the closed direction on a 3 month, cold shutdown or refuel outage basis in accordance with OM-10 Para. 4.3.2.1 for these valves is burdensome and does not provide a compensating increase in safety.

RELIEF REQUEST

Number: RR-V13, Revision 0 (Sheet 2 of 3)

REQUEST FOR RELIEF(CONT.):

These valves are Safety Class 2 one inch lift check valves located in the keep-fill pressurization lines for the RHR, CS, HPCI and RCIC piping systems. These valves are arranged in parallel downstream of a common non-nuclear safety Condensate Transfer supply check valve. The Vermont Yankee safety analysis does not require the non-nuclear safety Condensate Transfer check valve to perform a safety function in support of these systems. There are no test connections between the check valves or in any of the keep-fill pressurization lines.

The use of the series pair testing method suggested in NUREG 1482, subsection 4.1.1, "Closure Verification for Series Check Valves without Intermediate Test Connections," does not provide positive verification of closure of the subject check valves due to their configuration.

Individual check valve closure capability verification is presently accomplished by performing quarterly non-intrusive (radiography) testing. Indication of valve closure has been conclusive. However, this quarterly non-intrusive testing of the subject check valves during power operations has proven to be burdensome. Among the burdens imposed by this test method and frequency of testing are:

1. Increased personnel radiation exposure -- The transport, equipment setup, exposure and equipment removal account for approximately 400 mrem/year in increased personnel radiation dose.

2. Large manpower requirements -- The administration of radiological controls, control of the radiographic source and posting of exclusion areas during exposures at times requires the utilization of all available plant radiation controls personnel. The completion of all the radiographs typically requires two days each quarter.

3. Extensive test equipment setup -- The setup of the radiographic equipment and shielding of adjacent plant equipment is repeated for each valve tested.

4. Potential for unexpected challenges to plant safety systems -- The use of portable radioactive sources and their movements present the potential for unexpected challenges to plant safety systems due to high radiation actuations.

It is expected that the performance of radiography during cold shutdowns would present the additional burden of obtaining contract services on short notice.

RELIEF REQUEST

Number: RR-V13, Revision 0 (Sheet 3 of 3)

REQUEST FOR RELIEF(CONT.):

Vermont Yankee has investigated several alternate test methods with the following results:

1. Disassembly and Inspection of each valve on a refuel outage basis in accordance with OM-10, Para. 4.3.2.4(c) -- NRC guidance identified in Appendix A of NUREG 1482 (question group 15) and in a previously resolved Vermont Yankee IST Program Safety Evaluation anomaly discouraged the use of the disassembly and inspection method on the basis that disassembly is not a true substitute for operability testing using flow.

2. Performing sample non-intrusive testing with flow as described in NUREG 1482, subsection 4.1.2, "Exercising Check Valves with Flow and Nonintrusive Techniques" -- It was determined that this testing method is not applicable for these valves since the safety function of these valves is to close on cessation or reversal of flow.

3. Use of other non-intrusive testing methods (ultrasonic, magnetic or acoustic) -- Due to valve size, valve type and low flow rates through these keep-fill lines it is not expected that these methods would provide conclusive indication of valve closure.

ALTERNATE TEST METHOD:

Since the subject check valves are of simple design, operate under mild service conditions and the maintenance history for these valves indicates that they have not been susceptible to service induced failures or significant wear, Vermont Yankee proposes to perform non-intrusive testing (radiography) on each check valve once each operating cycle.

The alternate "disassembly and inspection" methods described in Generic Letter 89-04, Position 2, do not use actual check valve response to determine check valve operability and so are provided as a compromise. The proposed use of non-intrusive testing provides a test result that uses a direct obs tion of actual check valve operation in response to changes in system parameters. The of non-intrusive testing in this manner more closely approximates the intent of the code.

Although the same testing burden exists, the reduction in test frequency from 6 times per operating cycle to once per operating cycle will greatly reduce the risk of potential unexpected challenges to plant safety systems.

USNRC EVALUATION STATUS

RELIEF REQUEST

Number: RR-V14, Revision 0 (Sheet 1 of 3)

SYSTEM: Core Spray (CS)

COMPONENTS:

Valve Number	OM Cat.	Safety Class	Drawing Number	Dwg. Coord.
V14-22A	C	2	G-191168	I-09
V14-22B	C	2	G-191168	C-10
V14-23A	C	2	G-191168	I-09
V14-23B	C	2	G-191168	C-10

These valves are the Condensate transfer system to Core Spray flushing line check valves. These valves have a safety function to close to isolate the high pressure Safety Class 2 CS piping from the lower pressure non-safety grade Condensate Transfer System piping in the event of a CS system actuation.

EXAM OR TEST CATEGORY:

Category C

CODE REQUIREMENT: Part 10

Para. 4.3.2.1 "Exercising Test Frequency"

"Check valves shall be exercised nominally every 3 months, except as provided by paras.4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5."

REQUEST FOR RELIEF:

Relief is requested on the basis that individual full stroke exercise testing in the closed direction on a 3 month, cold shutdown or refuel outage basis in accordance with OM-10 Para. 4.3.2.1 for these valves is burdensome and does not provide a compensating increase in safety.

These valves are Safety Class 2 two inch lift check valves located in the flushing lines between the Core Spray System and the Condensate Transfer System. These valves are arranged in series-pairs in each flushing line. During normal power operation these flushing lines are isolated. There are no test connections between the check valves or in either flushing line.

The use of the series-pair testing method suggested in NUREG 1482, subsection 4.1.1, "Closure Verification for Series Check Valves without Intermediate Test Connections," does not provide positive verification of closure of the subject check valves due their configuration.

RELIEF REQUEST

Number: RR-V14, Revision 0 (Sheet 2 of 3)

REQUEST FOR RELIEF(CONT.):

Individual check valve closure capability verification is presently accomplished by performing quarterly non-intrusive (radiography) testing. Indication of valve closure has been conclusive. However, this quarterly non-intrusive testing of the subject check valves during power operations has proven to be burdensome. Among the burdens imposed by this test method and frequency of testing are:

1. Increased personnel radiation exposure -- The transport, equipment setup, exposure and equipment removal account for approximately 400 mrem/year in increased personnel radiation dose.

2. Large manpower requirements -- The administration of radiological controls, control of the radiographic source and posting of exclusion areas during exposures at times requires the utilization of all available plant radiation controls personnel. The completion of all the radiographs typically requires two days each quarter.

3. Extensive test equipment setup -- The setup of the radiographic equipment and shielding of adjacent plant equipment is repeated for each valve tested.

4. Potential for unexpected challenges to plant safety systems -- The use of portable radioactive sources and their movements present the potential for unexpected challenges to plant safety systems due to high radiation actuations.

It is expected that the performance of radiography during cold shutdowns would present the additional burden of obtaining contract services on short notice..

Vermont Yankee has investigated several alternate test methods with the following results:

1. Disassembly and Inspection of each valve on a refuel outage basis in accordance with OM-10, Para 4.3.2.4(c) -- NRC guidance identified in Appendix A of NUREG 1482 (question group 15) and in a previously resolved Vermont Yankee IST Program Safety Evaluation anomaly discouraged the use of the disassembly and inspection method on the basis that disassembly is not a true substitute for operability testing using flow.

RELIEF REQUEST

Number: RR-V14, Revision 0 (Sheet 3 of 3)

REQUEST FOR RELIEF(CONT.):

2. Performing sample non-intrusive testing with flow as described in NUREG 1482, subsection 4.1.2, "Exercising Check Valves with Flow and Nonintrusive Techniques" -- It was determined that this testing method is not applicable for these valves since the safety function of these valves is to close on cessation or reversal of flow.

ALTERNATE TEST METHOD:

Since the subject check valves are of simple design, operate under mild service conditions and the maintenance history for these valves indicates that they have not been susceptible to service induced failures or significant wear, Vermont Yankee proposes to perform non-intrusive testing (radiography) on each check valve once each operating cycle.

The alternate "disassembly and inspection" methods described in Generic Letter 89-04, Position 2, do not use actual check valve response to determine check valve operability and so are provided as a compromise. The proposed use of non-intrusive testing provides a test result that uses a direct observation of actual check valve operation in response to changes in system parameters. The use of non-intrusive testing in this manner more closely approximates the intent of the code.

Although the same testing burden exists, the reduction in test frequency from 6 times per operating cycle to once per operating cycle will greatly reduce the risk of potential unexpected challenges to plant safety systems.

USNRC EVALUATION STATUS

RELIEF REQUEST

Number: RR-V15, Revision 0 (Sheet 1 of 3)

SYSTEM: Reactor Core Isolation Cooling(RCIC)
High Pressure Coolant Injection(HPCI)

COMPONENTS:

Valve Number	OM Cat.	Safety Class	Drawing Number	Dwg. Coord.
V13-19	C	2	G-191174 Sh 1	E-14
V23-32	C	2	G-191169 Sh 1	E-11

Valve V13-19 is the Condensate Storage Tank(CST) supply to RCIC Pump suction check valve. This valve has a safety function to open to supply water from the CST to the RCIC pump suction. This valve also has a safety function to close to isolate the RCIC pump suction from the CST. When RCIC pump suction automatically transfers from the CST to the suppression pool, there is a short time when all RCIC pump suction MOVs are open at the same time. V13-19 is the only containment boundary between the suppression pool and the CST during this transfer of RCIC pump suction.

Valve V23-32 is the CST supply to HPCI Pump suction check valve. This valve has safety function to open to supply water from CST to the HPCI pump suction. This valve also has a safety function to close to isolate the HPCI pump suction from the CST. When HPCI pump suction automatically transfers from the CST to the suppression pool, there is a short time when all HPCI pump suction MOVs are open at the same time. V23-32 is the only containment boundary between the suppression pool and the CST during this transfer of HPCI pump suction.

EXAM OR TEST CATEGORY:

Category C

CODE REQUIREMENT: Part 10

Para. 4.3.2.1 "Exercising Test Frequency"

"Check valves shall be exercised nominally every 3 months, except as provided by paras.4.3.2.2, 4.3.2.3, 4.3.2.4 and 4.3.2.5."

REQUEST FOR RELIEF:

Relief is requested on the basis that individual full stroke exercise testing in the closed direction on a 3 month, cold shutdown or refuel outage basis in accordance with OM-10 Para. 4.3.2.1 for these valves is burdensome and does not provide a compensating increase in safety.

REQUEST FOR RELIEF(CONT.):

Individual check valve closure capability verification is presently accomplished by performing quarterly non-intrusive (radiography) testing as committed to in LER 96-01, Corrective Action #3. Indication of valve closure has been conclusive. However, this quarterly non-intrusive testing of the subject check valves during power operations has proven to be burdensome. Among the burdens imposed by this test method and frequency of testing are:

1. Increased personnel radiation exposure -- The transport, equipment setup, exposure and equipment removal account for approximately 400 mrem/year in increased personnel radiation dose.

2. Large manpower requirements -- The administration of radiological controls, control of the radiographic source and posting of exclusion areas during exposures at times requires the utilization of all available plant radiation controls personnel. The completion of all the radiographs typically requires two days each quarter.

3. Extensive test equipment setup -- The setup of the radiographic equipment and shielding of adjacent plant equipment is repeated for each valve tested.

4. Potential for unexpected challenges to plant safety systems -- The use of portable radioactive sources and their movements present the potential for unexpected challenges to plant safety systems due to high radiation actuations.

It is expected that the performance of radiography during cold shutdowns would present the additional burden of obtaining contract services on short notice..

Vermont Yankee has investigated several alternate test methods with the following results:

1. Disassembly and Inspection of each valve on a refuel outage basis in accordance with OM-10, Para. 4.3.2.4(c) -- NRC guidance identified in Appendix A of NUREG 1482 (question group 15) and in a previously resolved Vermont Yankee IST Program Safety Evaluation anomaly discouraged the use of the disassembly and inspection method on the basis that disassembly is not a true substitute for operability testing using flow.

2. Performing sample non-intrusive testing with flow as described in NUREG 1482, subsection 4.1.2, "Exercising Check Valves with Flow and Nonintrusive Techniques" -- It was determined that this testing method is not applicable for these valves since the safety function of these valves is to close on cessation or reversal of flow.

RELIEF REQUEST

Number: RR-V15, Revision 0 (Sheet 3 of 3)

ALTERNATE TEST METHOD:

Since the subject check valves are of simple design, operate under mild service conditions and the maintenance history for these valves indicates that they have not been susceptible to service induced failures or significant wear, Vermont Yankee proposes to perform non-intrusive testing (radiography) on each check valve once each operating cycle.

The alternate "disassembly and inspection" methods described in Generic Letter 89-04, Position 2, do not use actual check valve response to determine check valve operability and so are provided as a compromise. The proposed use of non-intrusive testing provides a test result that uses a direct observation of actual check valve operation in response to changes in system parameters. The use of non-intrusive testing in this manner more closely approximates the intent of the code.

Although the same testing burden exists, the reduction in test frequency from 6 times per operating cycle to once per operating cycle will greatly reduce the risk of potential unexpected challenges to plant safety systems.

The commitment made by Vermont Yankee in LER 96-01, corrective action #3 to verify closure operability of V13-19 and V23-32 by performing quarterly radiography will be superseded upon approval of this relief request.

USNRC EVALUATION STATUS

RELIEF REQUEST

Number: RR-P03, Revision 1 (Sheet 1 of 2)

SYSTEM: High Pressure Coolant Injection

COMPONENTS:

Pump Number	Safety Class	Drawing Number	Dwg. Coord.
P44-1A	2	G-191169 Sh 2	G-11
P44-1B	2	G-191169 Sh 2	G-10

P44-1A and P44-1B are the High Pressure Coolant Injection (HPCI) main (high pressure) and booster (low pressure) pumps, respectively. They have the safety functions to operate in series to provide 1) adequate core cooling and reactor vessel depressurization following a small break loss of coolant accident, and 2) reactor pressure control during reactor shutdown and isolation.

EXAM OR TEST CATEGORY:

Differential Pressure (dP).

CODE REQUIREMENT: Part 6

Para. 4.6.1.2(a) "Range"

> "The full-scale range of each analog instrument shall not be greater than three times the reference value."

Para. 4.6.2.2 "Differential Pressure"

> "When determining differential pressure across a pump, a differential pressure gauge or transmitter that provides direct measurement of pressure difference or the difference between the pressure at a point in the inlet pipe and the pressure at a point in the discharge pipe, may be used."

REQUEST FOR RELIEF:

Relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

RELIEF REQUEST

Number: RR-P03, Revision 1 (Sheet 2 of 2)

REQUEST FOR RELIEF(cont.):

Differential pressure across the HPCI pumps is determined by the difference between pressure measurements taken at a point in the inlet pipe and at a point in the discharge pipe as allowed by Paragraph 4.6.2.2 of Part 6 of the Code. The installed HPCI pump inlet pressure indicators are designed to provide adequate inlet pressure indication during all expected operating and post accident conditions. The full scale range, 85 psig, is sufficient for a post accident condition when the suppression chamber is at the maximum pressure. This, however, exceeds the full-scale range limit of three times the suction pressure reference value as required by Paragraph 4.6.1.2(a) of Part 6 of the Code (Value = approximately 26 psig, Limit = 78 psig).

The suction pressure measurement is used to verify prescribed NPSH requirements and to determine pump differential pressure. The installed gauges are calibrated to within +/- 1.17% accuracy (FS), thus the maximum variation in measured suction pressure due to inaccuracy would be +/- 0.99 psi. This is considered to be suitable for determining that adequate NPSH is available for HPCI pump operation.

Pump discharge pressure during testing is approximately 1170 psig, which results in a calculated differential pressure of approximately 1144 psig. The resulting inlet pressure inaccuracy of +/- 0.99 psi represents an error in differential pressure measurement of +/- 0.08% (0.99 psi/1144 psid = 0.00086). This is consistent with Table 1 of Part 6 of the Code, which requires that instrument accuracy for differential pressure be better than 2% of full-scale.

ALTERNATE METHOD:

Differential pressure will be measured using the existing station system installed inlet pressure indicators.

USNRC EVALUATION STATUS:

Relief was granted in the September 1993 SER [Reference (s)] for Relief Request RR-P03, Revision 0.

RELIEF REQUEST

Number: RR-P05, Revision 1 (Sheet 1 of 2)

SYSTEM: Core Spray

COMPONENTS:

Pump Number	Safety Class	Drawing Number	Dwg. Coord.
P46-1A	2	G-191168	J-11
P46-1B	2	G-191168	J-14

P46-1A & B are the low pressure Core Spray pumps. They have the safety function to operate to provide adequate core cooling following a loss of coolant accident and reactor depressurization.

EXAM OR TEST CATEGORY:

Differential Pressure (dP).

CODE REQUIREMENT: Part 6

Para. 4.6.1.2(a) "Range"

"The full-scale range of each analog instrument shall not be greater than three times the reference value."

Para. 4.6.2.2 "Differential Pressure"

"When determining differential pressure across a pump, a differential pressure gauge or transmitter that provides direct measurement of pressure difference or the difference between the pressure at a point in the inlet pipe and the pressure at a point in the discharge pipe, may be used."

REQUEST FOR RELIEF:

Relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

Differential pressure across the Core Spray pumps is determined by the difference between pressure measurements taken at a point in the inlet pipe and at a point in the discharge pipe as allowed by Paragraph 4.6.2.2 of Part 6 of the Code. The installed Core Spray pump inlet pressure indicators are designed to provide adequate inlet pressure indication during all expected operating and post accident conditions. The full scale range, 60 psig, is sufficient for a post accident condition when the suppression chamber is at the maximum pressure. This, however, exceeds the full-scale range limit of three times the suction pressure reference value as required by Paragraph 4.6.1.2(a) of Part 6 of the Code (Value = approximately 7.5 psig, Limit = 22 psig).

RELIEF REQUEST

Number: RR-P05, Revision 1 (Sheet 2 of 2)

REQUEST FOR RELIEF:

The suction pressure measurement is used to verify prescribed NPSH requirements and to determine pump differential pressure. The installed gauges are calibrated to within +/- 1.6% accuracy (FS), thus the maximum variation in measured suction pressure due to inaccuracy would be +/- 0.96 psi. This is considered to be suitable for determining that adequate NPSH is available for Core Spray pump operation.

Pump discharge pressure during testing is approximately 240 psig, which results in a calculated differential pressure of approximately 232.5 psig. The resulting inlet pressure inaccuracy of +/- 0.96 psi represents an error in differential pressure measurement of +/- 0.41% (0.96 psi/232.5 psid = 0.0041). This is consistent with Table 1 of Part 6 of the Code, which requires that instrument accuracy for differential pressure be better than 2% of full-scale.

ALTERNATE METHOD:

Differential pressure will be measured using the existing station system installed inlet pressure indicators.

USNRC EVALUATION STATUS:

Relief was granted in the September 1993 SER [Reference (s)] for Relief Request RR-P05, Revision 0.

RELIEF REQUEST

Number: RR-P06, Revision 1 (Sheet 1 of 2)

SYSTEM: Reactor Core Isolation Cooling

COMPONENTS:

Pump Number	Safety Class	Drawing Number	Dwg. Coord.
P47-1A	2	G-191174 Sh 2	F-08

P47-1A is the Reactor Core Isolation Cooling (RCIC) pump. It has the safety function to operate to provide makeup water to the reactor vessel during shutdown and isolation in order to prevent the release of radioactive materials to the environs as a result of inadequate core cooling.

EXAM OR TEST CATEGORY:

Differential Pressure (dP).

CODE REQUIREMENT: Part 6

Para. 4.6.1.2(a) "Range"

> "The full-scale range of each analog instrument shall not be greater than three times the reference value."

Para. 4.6.2.2 "Differential Pressure"

> "When determining differential pressure across a pump a differential pressure gauge or transmitter that provides direct measurement of pressure difference or the difference between the pressure at a point in the inlet pipe and the pressure at a point in the discharge pipe, may be used."

REQUEST FOR RELIEF:

Relief is requested on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

Differential pressure across the RCIC pump is determined by the difference between pressure measurements taken at a point in the inlet pipe and at a point in the discharge pipe as allowed by Paragraph 4.6.2.2 of Part 6 of the Code. The installed RCIC pump inlet pressure indicators are designed to provide adequate inlet pressure indication during all expected operating and post accident conditions. The full scale range, 85 psig, is sufficient for a post accident condition when the suppression chamber is at the maximum pressure. This, however, exceeds the full-scale range limit of three times the suction pressure reference value as required by Paragraph 4.6.1.2(a) of Part 6 of the Code (Value = approximately 20 psig, Limit = 60 psig).

RELIEF REQUEST

Number: RR-P06, Revision 1 (Sheet 2 of 2)

REQUEST FOR RELIEF:

The suction pressure measurement is used to verify prescribed NPSH requirements and to determine pump differential pressure. The installed gauges are calibrated to within +/- 1.17% accuracy (FS), thus the maximum variation in measured suction pressure due to inaccuracy would be +/- 0.99 psi. This is considered to be suitable for determining that adequate NPSH is available for RCIC pump operation.

Pump discharge pressure during testing is approximately 1130 psig, which results in a calculated differential pressure of approximately 1110 psig. The resulting inlet pressure inaccuracy of +/- 0.99 psi represents an error in differential pressure measurement of +/- 0.09% (0.99 psi/1110 psid = 0.00089). This is consistent with Table 1 of Part 6 of the Code, which requires that instrument accuracy for differential pressure be better than 2% of full-scale.

ALTERNATE METHOD:

Differential pressure will be measured using the existing station system installed inlet pressure indicators.

USNRC EVALUATION STATUS:

Relief was granted in the September 1993 SER [Reference (s)] for Relief Request RR-P06, Revision 0.

COLD SHUTDOWN JUSTIFICATION

Number: CSJ-V17 Revision 0 (Sheet 1 of 1)

SYSTEM: Instrument Air

COMPONENTS:

Valve Number	OM Cat.	Safety Class	Drawing Number	Dwg. Coord.
V72-28A	B	NNS	G-191160 Sh 3	L-15
V72-28B	B	NNS	G-191160 Sh 3	L-16
V72-28D	B	NNS	G-191160 Sh 3	K-16
V72-28E	B	NNS	G-191160 Sh 3	K-16

V72-28A and V72-28B have a safety function to close to isolate the Instrument Air (IA) system from the outboard MSIVs. Following an Appendix R fire event in the control room and cable spreading room, V72-28A and V72-28B are closed to isolate the air supply and V72-28D and V72-28E are opened to vent the residual air contained in the piping from the air supply isolation valves to the MSIV accumulators. This action prevents the MSIVs from inadvertently re-opening if a hot short were to occur in the MSIV solenoid circuitry. Reference: Minor Modification 96-34.

V72-28D and V72-28E have a safety function to open to vent the residual air contained in the IA system supply to the outboard MSIVs (V2-86A, V2-86B, V2-86C and V2-86D). Following an Appendix R fire event in the control room and cable spreading room, V72-28A and V72-28B are closed to isolate the air supply and V72-28D and V72-28E are opened to vent the residual air contained in the piping from air supply isolation valves to the MSIV accumulators. This action prevents the MSIVs from inadvertently re-opening if a hot short were to occur in the MSIV solenoid circuitry. Reference: Minor Modification 96-34.

Justification:

V72-28A and V72-28B cannot be exercised closed and V72-28D and V72-28E cannot be exercised open during power operation on a quarterly basis. Exercising these valves would isolate/vent instrument air to the outboard MSIV accumulators. Instrument Air pressure is required to maintain these MSIVs in the open position. The loss of instrument air pressure would cause the outboard MSIVs to go to the closed position and result in a reactor power transient.

V72-28A and V72-28B will be full-stroke closed and V72-28D and V72-28E will be full-stroke opened during Cold Shutdowns in accordance with Paragraphs 4.2.1.2(f) & (g) of Part 10 of the Code.

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