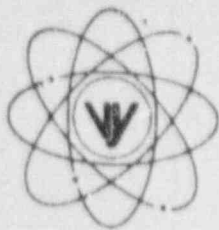


# VERMONT YANKEE NUCLEAR POWER CORPORATION



Ferry Road, Brattleboro, VT 05301-7002

REPLY TO  
ENGINEERING OFFICE  
580 MAIN STREET  
BOLTON, MA 01740  
(508) 779-6711

September 10, 1997  
BVY 97-115

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 97-104, dated August 13, 1997  
(c) Letter, VYNPC to USNRC, BVY 96-163, dated December 19, 1996  
(d) Telecon, USNRC to VYNPC, dated September 2, 1997

**Subject: Vermont Yankee Inservice Test Program - Revision 18**

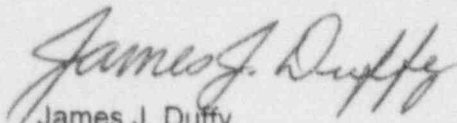
In Reference (b) Vermont Yankee provided additional information requested by the NRC regarding the relief requests and cold shutdown justifications submitted in Reference (c). In Reference (d) the NRC requested further information regarding the burdens imposed by current requirements and specification of when the proposed alternate testing would be performed. The requested information is attached. Please replace relief requests RR-V13, RR-V14 and RR-V15 provided in Reference (b) with the respective relief requests provided in Attachment A.

Vermont Yankee makes no new commitments with this letter other than those stated in the attached revised relief requests.

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

9709160177 970910  
PDR ADOCK 05000271  
P PDR

Attachment A

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



A047/1

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

Below are changes made to Vermont Yankee's August 1997 submittal [Reference (b)]:

#### Relief Request RR-V13, Revision 0

- The "Request for Relief" section was revised to add an additional burden clarification that performing radiography during refueling outages will present an added risk of increased personnel radiation exposure.
- The "Alternate Test Method" section was revised to add that testing once each operating cycle but not during refueling outages will reduce the risk of increased personnel radiation exposure.
- The "Alternate Test Method" section was revised to add that the once-per-operating cycle non-intrusive testing would be performed within 2 months of the scheduled start of the next refueling outage.

#### Relief Request RR-V14, Revision 0

- The "Request for Relief" section was revised to add an additional burden clarification that performing radiography during refueling outages will present an added risk of increased personnel radiation exposure.
- The "Alternate Test Method" section was revised to add that testing once each operating cycle but not during refueling outages will reduce the risk of increased personnel radiation exposure.
- The "Alternate Test Method" section was revised to add that the once-per-operating cycle non-intrusive testing would be performed within 2 months of the scheduled start of the next refueling outage.

#### Relief Request RR-V15, Revision 0

- The "Request for Relief" section was revised to add an additional burden clarification that performing radiography during refueling outages will present an added risk of increased personnel radiation exposure.
- The "Alternate Test Method" section was revised to add that testing once each operating cycle but not during refueling outages will reduce the risk of increased personnel radiation exposure.
- The "Alternate Test Method" section was revised to add that the once-per-operating cycle non-intrusive testing would be performed within 2 months of the scheduled start of the next refueling outage.

## 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.

It is also expected that performing radiography during refuel outages will present an added risk of increased radiation exposure to personnel as more people will be subject to possible exposure during refuel outages.

## 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 within 2 months of the scheduled start of the next refueling outage. Testing once each operating cycle but not during refuel outages (relief request required) will reduce the risk of increased radiation exposure to personnel as fewer people will be subject to possible exposure.

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-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.

It is also expected that performing radiography during refuel outages will present an added risk of increased radiation exposure to personnel as more people will be subject to possible exposure during refuel outages.

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 NUREC 182, 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. Vermont Yankee proposes to perform non-intrusive testing (radiography) on each check valve once each operating cycle within 2 months of the scheduled start of the next refueling outage. Testing once each operating cycle but not during refuel outages (relief request required) will reduce the risk of increased radiation exposure to personnel as fewer people will be subject to possible exposure.

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.

## RELIEF REQUEST

Number: RR-V15, 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 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.

It is also expected that performing radiography during refuel outages will present an added risk of increased radiation exposure to personnel as more people will be subject to possible exposure during refuel outages.

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-V15, 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. Vermont Yankee proposes to perform non-intrusive testing (radiography) on each check valve once each operating cycle within 2 months of the scheduled start of the next refueling outage. Testing once each operating cycle but not during refuel outages (relief request required) will reduce the risk of increased radiation exposure to personnel as fewer people will be subject to possible exposure.

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