



Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.
Vermont Yankee
185 Old Ferry Rd.
P.O. Box 500
Brattleboro, VT 05302
Tel 802-257-5271

October 6, 2004

Docket No. 50-271

BVY 04-105

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**Subject: Vermont Yankee Nuclear Power Station
Technical Specification Proposed Change No. 267
Drywell Spray Header and Nozzle Air Test Frequency**

Pursuant to 10CFR50.90, Entergy Nuclear Operations, Inc. (Entergy) hereby proposes to amend Vermont Yankee's (VY) Facility Operating License, DPR-28, by incorporating the attached proposed change into the VY Technical Specifications.

The proposed change would revise the Technical Specification Surveillance Requirement 4.5.B.1, Containment Spray Cooling Capability and associated Bases. Specifically, the surveillance frequency for the drywell spray loops (air test) is requested to be revised.

Attachment 1 to this letter contains supporting information, safety assessment of the proposed change and a determination of no significant hazards consideration. Attachment 2 provides the marked-up version of the current Technical Specification and associated Bases page. Attachment 3 provides the retyped Technical Specification and Bases page.

VY has reviewed the proposed Technical Specification change in accordance with 10CFR50.92 and believes that the proposed change does not involve a significant hazards consideration.

In accordance with 10CFR50.91, a copy of this application and the associated attachments are being submitted to the designated Vermont State official.

There are no new commitments being made in this submittal.

Entergy requests approval of the proposed amendment by September 30, 2005 with the amendment being implemented within 60 days of issuance.

ADD1

If you have any questions or require additional information, please contact Mr. James M. DeVincentis at (802) 258-4236.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 10/6/04.

Sincerely,



Jay K. Thayer

Jay K. Thayer
Site Vice President
Vermont Yankee Nuclear Power Station

Attachments (3)

cc: Mr. Richard B. Ennis, Project Manager
License Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop O-8-B1
Washington, DC 20555

Mr. Samuel J. Collins
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

USNRC Resident Inspector
Vermont Yankee Nuclear Power Station
320 Governor Hunt Road
P.O. Box 157
Vernon, VT 05354

Mr. David O'Brien, Commissioner
VT Department of Public Service
112 State Street, Drawer 20
Montpelier, VT 05620-2601

ATTACHMENT 1 TO BVY 04-105

**DESCRIPTION AND ASSESSMENT OF
TECHNICAL SPECIFICATION PROPOSED CHANGE NO. 267**

Drywell Spray Header and Nozzle Air Test Frequency

**ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271**

1. DESCRIPTION

The proposed license amendment would revise Technical Specification (TS) surveillance section 4.5.B.1 and the associated Bases. Specifically, the frequency specified for the drywell spray loops is requested to be revised from a 5-year periodicity to "following maintenance that could result in nozzle blockage."

Entergy Nuclear Operations, Inc. (Entergy) requests approval of the proposed amendment for Vermont Yankee (VY) by September 30, 2005 to support our upcoming Refueling Outage 25, currently scheduled to commence in October 2005.

2. PROPOSED CHANGES

VY's TS Section 4.5.B.1, "Containment Spray Cooling Capability" currently states:

"Surveillance of the drywell spray loops shall be performed as follows. During each five-year period, an air test shall be performed on the drywell spray headers and nozzles."

The proposed change would revise the frequency by which the spray header and nozzle test is conducted. Specifically, the last sentence would be modified to state:

"Surveillance of the drywell spray loops shall be performed as follows. An air test shall be performed on the drywell spray headers and nozzles following maintenance that could result in nozzle blockage."

The associated TS Bases state:

"Once every five years air tests will be performed to assure that the containment spray header nozzles are operable."

The proposed change would revise the Bases to read as follows:

"Surveillance 4.5.B.1 is performed following maintenance that could result in nozzle blockage, to verify that the spray nozzles are free of obstructions by blowing air through them and demonstrating an open flow path. The frequency for performance of this surveillance test is adequate due to the passive nozzle design, its normally dry state and has been shown to be acceptable through operating experience."

3. BACKGROUND

The VY Residual Heat Removal (RHR) system has a containment cooling mode of operation. In the containment cooling mode of operation, the RHR system can be used for suppression pool cooling or containment spraying. For drywell spraying, flow can be manually directed through two spray headers. Each header has 140 fog-type spray nozzles capable of being supplied by the respective RHR subsystem. The spray nozzles are made of corrosion resistant brass and each nozzle assembly consists of 7 individual spray caps. Each spray cap is removable and has an internal vane assembly, designed to provide a shower-like full cone spray pattern.

4. TECHNICAL ANALYSIS

The drywell spray portion of the containment cooling mode of the RHR system is designed to provide a means to control both temperature and pressure inside the primary containment under post-accident conditions. Each drywell spray header is capable of providing approximately 6650 gpm of spray flow. The drywell sprays will cool non-condensable gases and condense any steam, thereby lowering containment temperature and pressure after an accident.

The drywell spray headers and nozzles are of a passive design without moving parts. The nozzles are made of corrosion resistant brass. The header and spray nozzles are normally maintained dry and isolated from the water source in the RHR systems by motor operated valves. The headers are also equipped with drain lines to remove any water that enters the headers as a result of periodic valve surveillances. Further, the primary containment is inerted with nitrogen during plant operation, thus minimizing the potential for corrosion product formation.

This surveillance requirement is designed to verify that the spray nozzles are not obstructed and that flow will be provided, if required. The periodic air tests currently performed in accordance with this surveillance are hazardous to the personnel performing the surveillance from an industrial safety perspective. Individuals performing these surveillances must access the upper regions of the drywell. Also radiation exposure to the workers due to the proximity of high radiation sources located in the primary containment can be minimized.

A review of historical surveillance records dating from 1986 to present, identified only one instance (April 1995) of blockage of three individual drywell spray caps. There are 140 nozzles with 7 spray caps per nozzle, or 980 spray caps in each drywell spray loop. This condition constituted a 0.3% failure rate for this particular spray header surveillance. Considering the margin in the system design, that this occurred in only one of the redundant spray loops during one surveillance interval, this is considered insignificant and of no consequence to the operation of the sprays.

VY's foreign material exclusion (FME) program requires that breaches of system boundaries be appropriately protected from the intrusion of foreign materials. The FME program provides guidelines that establish cleanliness requirements and accounting of material, tools and parts to preclude the introduction of foreign materials into systems or components during maintenance, modification, test or inspection activities. The program requires the highest level of controls for safety related systems, such as the RHR system. These controls are sufficient to ensure that material is not inadvertently introduced.

5. PRECEDENT

Similar amendments have been issued to the following power stations:

Perry Nuclear Power Plant – approved June 29, 2000
Clinton Power Station – approved March 28, 2002

Conclusion:

Entergy believes that due to the passive nature and good past surveillance performance of the drywell spray system, the system being in an inerted environment and normally maintained dry, the industrial safety risks and the radiation exposure to personnel and similar approvals for other stations, that a revision to the drywell spray loop surveillance frequency from every 5 years to following maintenance that could result in nozzle blockage, is warranted at Vermont Yankee.

6. REGULATORY SAFETY ANALYSIS

6.1 No Significant Hazards Consideration

The proposed change to Section 4.5.B.1 of the Vermont Yankee Nuclear Power Station (VY) Technical Specifications would allow for a revision to the surveillance frequency (air test) of the drywell spray headers and nozzles from once every five years to following maintenance that could result in nozzle blockage.

Pursuant to 10CFR50.92, Entergy Nuclear Operations, Inc. (Entergy) has reviewed the proposed change and concludes that the change does not involve a significant hazards consideration since the proposed change satisfies the criteria in 10CFR50.92(c).

1. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

This proposed amendment is limited to changes to the surveillance testing requirements applicable to the drywell spray headers and nozzles. These surveillance tests are performed while the plant is in a cold shutdown condition and the equipment is not required to be operable. The testing is to verify that the spray headers and nozzles are not obstructed. The drywell spray headers and nozzles are not initiators of any accidents previously evaluated.

A change in surveillance frequency will not result in any changes to systems structures and components, or their method of operation. The new surveillance frequency will not result in a decrease in system performance or availability.

Therefore, the proposed changes do not represent a significant increase in the probability or consequences of an accident previously analyzed.

2. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed extension to a surveillance testing interval does not create the possibility of a new or different type of accident, since there are no physical changes being made to the plant and there are no changes to the operation of the plant that could introduce a new failure mode, creating an accident or affecting the mitigation of an accident.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously analyzed.

3. The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment will not involve a significant reduction in a margin of safety.

The proposed change revises the surveillance requirement to verify that the drywell spray headers and nozzles are unobstructed. Industry experience, VY surveillance history and the environmental conditions the system is subjected to are adequate to ensure continued system availability. As the spray nozzles are expected to remain unobstructed and be able to perform their post-accident function, plant safety is not affected.

Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

6.2 Environmental Consideration

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), no environmental assessment needs to be prepared in connection with the proposed amendment.

ATTACHMENT 2 TO BVY 04-105

**MARKUP OF TECHNICAL SPECIFICATION AND BASES PAGES FOR
TECHNICAL SPECIFICATION PROPOSED CHANGE NO. 267**

Drywell Spray Header and Nozzle Air Test Frequency

**ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271**

3.5 LIMITING CONDITION FOR OPERATION

5. All recirculation pump discharge valves and bypass valves shall be operable or closed prior to reactor startup.
6. If the requirements of Specifications 3.5.A cannot be met, an orderly shutdown of the reactor shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

B. Containment Spray Cooling Capability

1. Both containment cooling spray loops are required to be operable when the reactor water temperature is greater than 212°F except that a Containment Cooling Subsystem may be inoperable for thirty days.
2. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

4.5 SURVEILLANCE REQUIREMENT

5. Recirculation pump discharge valves shall be tested to verify full open to full closed in $27 \leq t \leq 33$ seconds and bypass valves shall be tested for operability in accordance with Specification 4.6.E.

B. Containment Spray Cooling Capability

1. Surveillance of the drywell spray loops shall be performed as follows. During each five-year period An air test shall be performed on the drywell spray headers and nozzles following maintenance that could result in nozzle blockage.
2. Deleted.

BASES:

4.5 CORE AND CONTAINMENT COOLANT SYSTEMS

A. Core Spray and LPCI

During normal plant operation, manual tests of operable pumps and valves shall be conducted in accordance with Specification 4.6.E to demonstrate operability.

During each refueling shutdown, tests (as summarized below) shall be conducted to demonstrate proper automatic operation and system performance.

Periodic testing as described in Specification 4.6.E will demonstrate that all components which do not operate during normal conditions will operate properly if required.

The automatic actuation test will be performed by simulation of high drywell pressure or low-low water level. The starting of the pump and actuation of valves will be checked. The normal power supply will be used during the test. Testing of the sequencing of the pumps when the diesel generator is the source of power will be checked during the testing of the diesel. Following the automatic actuation test, the flow rate will be checked by recirculation to the suppression chamber. The pump and valve operability checks will be performed by manually starting the pump or activating the valve. For the pumps, the pump motors will be run long enough for them to reach operating temperatures.

B. and C. Containment Spray Cooling Capability and RHR Service Water Systems

The periodic testing requirements specified in Specifications 4.5.B and C will demonstrate that all components will operate properly if required. Since this is a manually actuated system, no automatic actuation test is required. The system will be activated manually and the flow checked by an indicator in the control room.

~~Once every five years air tests will be performed to assure that the containment spray header nozzles are operable.~~

D., E., and F. Station Service Water and Alternate Cooling Tower Systems and High Pressure Coolant Injection and Automatic Depressurization System

HPCI system testing demonstrates operational readiness of equipment and detects degradations which may affect reliable operation. Testing is conducted during each reactor startup if maintenance that affects operability was performed on the HPCI system. Periodic testing is also performed in accordance with Specification 4.6.E and the inservice testing program.

Sufficient steam flow must be available prior to HPCI testing to avoid inducing an operational transient when steam is diverted to the HPCI system. Reactor startup is allowed prior to performing the required surveillance testing in order to achieve adequate steam pressure and flow. However, a 24-hour limitation is imposed for performing operability testing once reactor steam pressure exceeds 150 psig. The short duration before full functional testing is performed is considered acceptable.

INSERT
(next pg)

BASES INSERT:

Surveillance 4.5.B.1 is performed following maintenance that could result in nozzle blockage, to verify that the spray nozzles are free of obstructions by blowing air through them and demonstrating an open flow path. The frequency for performance of this surveillance test is adequate due to the passive nozzle design, its normally dry state and has been shown to be acceptable through operating experience.

ATTACHMENT 3 TO BVY 04-105

**RETYPE TECHNICAL SPECIFICATION AND BASES PAGES FOR
TECHNICAL SPECIFICATION PROPOSED CHANGE NO. 267**

Drywell Spray Header and Nozzle Air Test Frequency

**ENTERGY NUCLEAR OPERATIONS, INC.
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271**

Listing of Affected Technical Specification and Bases Pages

Replace the Vermont Yankee Nuclear Power Station Technical Specifications pages listed below with the revised pages. The revised pages contain vertical lines in the margin indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
102	102
113	113
114	114

3.5 LIMITING CONDITION FOR OPERATION

5. All recirculation pump discharge valves and bypass valves shall be operable or closed prior to reactor startup.
6. If the requirements of Specifications 3.5.A cannot be met, an orderly shutdown of the reactor shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

B. Containment Spray Cooling Capability

1. Both containment cooling spray loops are required to be operable when the reactor water temperature is greater than 212°F except that a Containment Cooling Subsystem may be inoperable for thirty days.
2. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

4.5 SURVEILLANCE REQUIREMENT

5. Recirculation pump discharge valves shall be tested to verify full open to full closed in $27 \leq t \leq 33$ seconds and bypass valves shall be tested for operability in accordance with Specification 4.6.E.

B. Containment Spray Cooling Capability

1. Surveillance of the drywell spray loops shall be performed as follows. An air test shall be performed on the drywell spray headers and nozzles following maintenance that could result in nozzle blockage.
2. Deleted.

BASES:4.5 CORE AND CONTAINMENT COOLANT SYSTEMSA. Core Spray and LPCI

During normal plant operation, manual tests of operable pumps and valves shall be conducted in accordance with Specification 4.6.E to demonstrate operability.

During each refueling shutdown, tests (as summarized below) shall be conducted to demonstrate proper automatic operation and system performance.

Periodic testing as described in Specification 4.6.E will demonstrate that all components which do not operate during normal conditions will operate properly if required.

The automatic actuation test will be performed by simulation of high drywell pressure or low-low water level. The starting of the pump and actuation of valves will be checked. The normal power supply will be used during the test. Testing of the sequencing of the pumps when the diesel generator is the source of power will be checked during the testing of the diesel. Following the automatic actuation test, the flow rate will be checked by recirculation to the suppression chamber. The pump and valve operability checks will be performed by manually starting the pump or activating the valve. For the pumps, the pump motors will be run long enough for them to reach operating temperatures.

B. and C. Containment Spray Cooling Capability and RHR Service Water Systems

The periodic testing requirements specified in Specifications 4.5.B and C will demonstrate that all components will operate properly if required. Since this is a manually actuated system, no automatic actuation test is required. The system will be activated manually and the flow checked by an indicator in the control room.

Surveillance 4.5.B.1 is performed following maintenance that could result in nozzle blockage, to verify that the spray nozzles are free of obstructions by blowing air through them and demonstrating an open flow path. The frequency for performance of this surveillance test is adequate due to the passive nozzle design, its normally dry state and has been shown to be acceptable through operating experience.

BASES: 4.5 (Cont'd)D., E., and F. Station Service Water and Alternate Cooling Tower Systems and High Pressure Coolant Injection and Automatic Depressurization System

HPCI system testing demonstrates operational readiness of equipment and detects degradations which may affect reliable operation. Testing is conducted during each reactor startup if maintenance that affects operability was performed on the HPCI system. Periodic testing is also performed in accordance with Specification 4.6.E and the inservice testing program.

Sufficient steam flow must be available prior to HPCI testing to avoid inducing an operational transient when steam is diverted to the HPCI system. Reactor startup is allowed prior to performing the required surveillance testing in order to achieve adequate steam pressure and flow. However, a 24-hour limitation is imposed for performing operability testing once reactor steam pressure exceeds 150 psig. The short duration before full functional testing is performed is considered acceptable.

The Automatic Depressurization System is tested during refueling outages to avoid an undesirable blowdown of the Reactor Coolant System.

The HPCI Automatic Actuation Test will be performed by simulation of the accident signal. The test is normally performed in conjunction with the automatic actuation of all Core Standby Cooling Systems.

G. Reactor Core Isolation Cooling System

The frequency and conditions for testing of the RCIC system are the same as for the HPCI system. Testing is conducted in accordance with Specification 4.6.E and provides assurance that the system will function as intended.

H. Minimum Core and Containment Cooling System Availability

Deleted.

I. Maintenance of Filled Discharge Pipe

Observation of water flowing from the discharge line high point vent as required by Specification 4.5.I assures that the Core Cooling Subsystems will not experience water hammer damage when any of the pumps are started. Core Spray Subsystems and LPCI Subsystems will also be vented through the discharge line high point vent following a return from an inoperable status to assure that the system is "solid" and ready for operation.