Entergy

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September 2, 2004

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

SUBJECT: Pilgrim Nuclear Power Station
Docket No. 50-293
License No. DPR-35

Proposed License Amendment: Revision to the Technical Specification (TS) Surveillance Requirement (SR) Frequency for Containment and Suppression Pool (Torus) Spray Headers and Nozzles Inspections (TS 4.5.B.2.2)

LETTER NUMBER: 2.04.033

Dear Sir:

Pursuant to 10 CFR 50.90, Entergy hereby proposes to amend the Technical Specifications to revise the surveillance requirement frequency in TS 4.5.B.2.2 from "once per 5 years" to "following maintenance that could result in nozzle blockage".

The proposed TS change would reduce the overall outage radiation exposure, improve personnel safety, and reduce cost. Therefore, Entergy requests NRC review and approval of proposed TS change by April 1, 2005.

This letter contains no commitments.

Entergy will implement the TS changes in 60 days upon receipt of an approved license amendment.

Please contact Mr. Bryan Ford at (508) 830-8403, if you have any questions.

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

Executed on the 2ND day of SEPTEMBER 2004.

Sincerely,

Michael A. Balduzzi

Michael A. Balduzzi

WGL/dm

ADD
A047

Attachments:
1. Description of the Proposed Technical Specification Change (7 pages)
2. Marked-up Pilgrim Technical Specifications - (2 pages)

cc:

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ATTACHMENT 1

Subject: Description of Proposed Technical Specification Change

1.0 DESCRIPTION

2.0 PROPOSED CHANGE

3.0 BACKGROUND

4.0 TECHNICAL ANALYSIS

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- 4.2 Foreign Material Exclusion (FME) Program
- 4.3 Post Maintenance Testing (PMT)
- 4.4 Material
- 4.5 Safety Assessment

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1.0 DESCRIPTION

Pursuant to 10 CFR 50 Entergy proposes to amend the Technical Specifications (TS) for Pilgrim Nuclear Power Station. The proposed change revises the surveillance frequency for air testing the drywell and suppression pool (torus) spray headers and nozzles from "once per 5 years" to "following maintenance that could result in nozzle blockage".

This change is similar to the amendment request previously approved for the Perry Nuclear Power Plant, Clinton Power Station, North Anna Power Station, H. B. Robinson, Byron/Braidwood Nuclear Stations, Surry Power Station, Beaver Valley Power Station, Salem Nuclear Power Plant, Palisades Nuclear Station, and South Texas Project, Units 1 and 2.

Entergy requests NRC review and approval of the proposed TS change by April 1, 2005.

2.0 PROPOSED CHANGE

1. Current Requirement

   The current TS 4.5.B.2.2 states: "Air test drywell and suppression pool (torus) headers and nozzles once per 5 years".

2. Proposed Requirement

   The proposed TS 4.5.B.2.2 states: "Air test drywell and suppression pool (torus) headers and nozzles following maintenance that could result in nozzle blockage".

Corresponding changes to the TS Bases are included for information.

3.0 BACKGROUND

The current surveillance is performed every 5 years by an airflow test during a refueling outage to verify that the spray headers and nozzles are not obstructed and that flow will be provided when required.

The results of the past airflow tests, the passive design, operating conditions, and implementation of post maintenance testing and foreign material exclusion programs demonstrate that nozzle blockage is unlikely.

The proposed TS change would reduce the outage radiation exposure, improve personnel safety, and reduce overall cost of the outage. Currently the airflow test is scheduled to be performed during the upcoming refueling outage (RFO-15) to comply with the current TS 4.5.B.2.2 frequency. The surveillance requires alignment of systems, staging of testing equipment, and use of operations and maintenance staff in a high radiation area. The surveillance evolution, which typically requires up to 18 hours with 4 to 5 operations and maintenance personnel, impacts refueling outage schedule and resources, presents personnel safety risk, and results in cumulative radiological exposure between 0.5 R to 1.0 R with little or no benefits, in light of the existing system design and programs and practices to prevent blockage of spray nozzle heads.

4.0 TECHNICAL ANALYSIS

The Pilgrim containment and suppression pool (torus) spray systems are part of Residual Heat Removal (RHR) system and consists of two drywell spray loops and one torus spray loop. The drywell spray loops consists of an upper spray header, sparger A and a lower spray header, sparger B. The lower sparger has 196 spray nozzles and the upper sparger has 208 spray nozzles mounted symmetrically (see Upper and Lower Spray Header Assembly Figure). The torus spray loop consists of 6-spray nozzles within the torus space.

The current TS surveillance requires an airflow test of the drywell and torus headers and nozzles be performed once every 5 years. The air test is performed by draining the water from a portion of the piping to the header of the selected spray loop and injecting compressed air to the nozzle header. Spray nozzles are then checked to ensure that the header and nozzles are unobstructed. A remote visual examination is also performed by removing four nozzles from each drywell spray header and inserting an inspection device to examine the header piping to ensure there is no blockage.

This surveillance requires operation and verification of equipment both from the control room and locally. After the airflow test is satisfactorily completed, the spray header supply piping will be filled and vented to prevent subsequent water hammer events.

4.1 Previous Experience

The most recent previous airflow test was performed in 1999 during RFO-12 and identified no operational and obstruction issues. Prior airflow tests also had no findings, except for the RFO-7 airflow test. During the RFO-07 airflow test, rust particles of size 1/16 to 1/4 inch were observed in the headers. An investigation confirmed that the particles were introduced in 1984 as a result of construction to replace the recirluation system piping followed by inadvertent actuation of containment spray nozzles. In spite of the presence of particles, the operability of containment spray was assured. Following this incident, Pilgrim has implemented significant procedural controls to ensure headers and spray nozzles remain free of flow obstructing materials. These are explained below.

4.2 Foreign Material Exclusion (FME) Program

The Pilgrim FME program describes the measures to be taken to ensure foreign material is not introduced into a component or system, or to recover the foreign material if it is introduced. The FME program requires that any breaches of system boundaries during maintenance activities be protected from intrusion of foreign material into the system. Examples of FME controls include covers for open pipes, in-process and closeout inspections, and accounting for tools, material and parts. The inventory of materials used and capture of all foreign material created (such as from grinding, welding, and machining) are important aspects of this program. If control of foreign material is lost, the material is required to be recovered. If the foreign material is not recovered, it must be evaluated to determine it's impact on system operability. The FME program requires that when closing a system or component, an inspection be performed to ensure that all foreign material is removed. This requirement applies to all work and inspection activities performed on plant systems and components. If required FME is not maintained, a Condition Report is initiated requiring assessment of the circumstances and implementation of appropriate corrective actions.

Due to the location and orientation of the spray headers and nozzles at the top of the drywell and within the torus, introduction of foreign materials into the spray headers and nozzles is unlikely. This program along with Post Maintenance Testing program provides for the implementation of the proposed TS surveillance.

4.3 Post Maintenance Testing (PMT)

The proposed change is based upon the existing requirement to verify system operability after system maintenance or repair. Foreign material introduced as a result of maintenance is the most likely cause of obstruction; therefore, verification to confirm the nozzles are free of blockage following maintenance activities that could result in nozzle blockage is sufficient to confirm the nozzles are free of blocking substance. The current post-maintenance testing procedure provides this verification, which requires testing of the system and components following maintenance activities as necessary to demonstrate operability. Therefore, the proposed surveillance to "Air test drywell and suppression pool (torus) headers and nozzles following maintenance that could result in nozzle blockage" is adequate to verify nozzle operability. Also, the spray headers and nozzles are located at the top of the drywell and the torus, which are areas not normally impacted by the maintenance activities. Consequently, the potential for unidentified nozzle obstruction or introduction of foreign material following maintenance is very low.

Normal plant operation and maintenance practices are not expected to trigger the surveillance requirement as proposed. Only an unanticipated circumstance would initiate this surveillance, such as an inadvertent spray actuation or loss of foreign material control when working within the affected boundary of the system. Procedures will require performance of an evaluation to determine whether a containment spray nozzle test would be required to ensure the nozzles remain unobstructed to support system operability following these events.

4.4 Material

The containment and torus spray nozzles are made of corrosion-resistant bronze materials and are threaded into the spray headers. The nozzles are designed to atomize and evenly distribute water droplets to the containment atmosphere and torus space for the purpose of removing heat and reducing pressure following an accident. The header pipe is made of carbon steel. The header pipe, spray headers, and spray nozzles are maintained dry and isolated from the water in the RHR system by motor operated valves in each header, other than when the isolation valves are tested during refueling outages. The dry nozzles and spray headers, and header pipe are not expected to rust significantly in the inert containment atmosphere during normal operations and brief normal air atmosphere during refueling operations. Accordingly, the material condition of the spray headers and nozzles would remain functional and operational to provide the required flow following an accident.

4.5 Safety Assessment

The drywell and torus spray system is an ESF system used in response to a postulated Loss of Coolant Accident (LOCA). The spray system is designed to limit the primary containment pressure and temperature below design limits and to reduce the quantity of iodine to mitigate LOCA conditions. These functions are performed by subcooled atomized water sprayed into the containment atmosphere through nozzles from spray headers located in the containment dome and torus. The major benefit of the drywell and torus spray system is the quenching of steam in the containment atmosphere and removal of radioiodines.

The drywell and torus spray system supplements suppression pool cooling mode of the RHR system. The spray system is manually initiated, and is designed to provide, if required, 1000 GPM to the drywell spray and 240 GPM to the torus spray, in addition to 3260 GPM to the suppression pool, for a total of 4500 GPM with one RHR pump in operation. The drywell and torus spray provides spray capability as an alternate method for controlling containment pressure following LOCA. The primary method for reducing the containment pressure and temperature following LOCA is provided by the suppression pool-cooling mode of the RHR system.

The drywell spray spargers A and B are two 100% capacity loops. Thus, two levels of redundancy are designed in the drywell spray to ensure containment spray is available, even if one sparger is not available for any reason. In addition, the primary method- suppression pool-cooling mode - is available. Thus, there is adequate safety margin to remove energy from the containment following LOCA.

Therefore, based on previous experience, implemented FME and PMT programs, passive design of the system, operating conditions, plant safety can be assured at the proposed frequency without impacting the mitigating system performance.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Entergy Nuclear Operations, Inc. (Entergy) proposes to change Pilgrim Technical Specifications (TS) surveillance requirement, TS 4.5.B.2.2. The proposed change revises the current testing frequency for the drywell and torus spray headers and nozzles from " once per 5 years" to "following maintenance that could result in nozzle blockage".

Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously analyzed?

   Response: No.

   The drywell and torus headers and spray nozzles are not assumed to be initiators of any accidents previously evaluated. Maintenance practices and normal environmental conditions to which the system is subjected are adequate to ensure operability of the systems. Since the system will be able to perform its accident mitigation function, the consequences of accident previously evaluated are not increased. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously analyzed?

   Response: No

   The revised surveillance does not introduce any new mode of plant operation, does not involve physical modification of the plant, or any new operating modes, and cannot introduce new accident initiators. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in the margin of safety?

   Response: No

   Maintenance practices and normal environmental conditions to which the system is subjected are adequate to ensure operability of the systems. As the spray nozzles are expected to remain fully capable of performing their post-accident mitigation function, margin of safety is not reduced. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements

The applicable criteria from 10 CFR 50, Appendix A General Design Criteria (GDC) for Nuclear Plants associated with Containment Spray and Cooling System are: GDC 38, "Containment Heat Removal", GDC 39, "Inspection of Containment Heat Removal System", GDC 40, "Testing of Containment Heat Removal System", and GDC 50, "Containment Design Basis." The proposed revision of the surveillance requirements does not impact conformance with the applicable GDCs.

The drywell and torus spray system, part of the RHR system, is designed to reduce containment pressure following an accident in order to meet the requirements of 10 CFR 50.46 and 10 CFR 50.49. The system operability requirements, combined with the requirement to perform post-maintenance testing to verify system operability, minimizes the potential for nozzle obstruction and provides confidence that the system can perform its intended functions. Therefore, the proposed revision of the surveillance requirement frequency to verify spray headers and nozzles are unobstructed following maintenance, that could result in nozzle blockage is consistent with applicable regulatory requirement.

The in-service inspection (ISI) requirements of 1989 ASME Code, Section XI, IWC-5222 (d) for the Third ISI interval requires demonstration of an open flow path test be performed in lieu of system hydrostatic test. The containment spray headers at Pilgrim are categorized as ASME Code Class 2 piping, Category C-H, Code item C7.40. This open-ended discharge piping beyond the last shutoff valve is allowed by paragraph IWC-5222 (d) to be tested once every 10 years by demonstration of an open flow path performed in lieu of the 10-year hydrostatic test. For the Third ISI interval, the operability test performed in 1999 in accordance with TS 4.5.B.2.2 in lieu of the hydrostatic test met that requirement and Pilgrim is in compliance with the 1989 ASME Code Section XI, IWC-5222 (d) requirement.

In conclusion, based on the consideration discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

The proposed change would revise a surveillance requirement frequency related to a system/component located within the restricted area, as defined in 10 CFR 20. However, the proposed change 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, (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

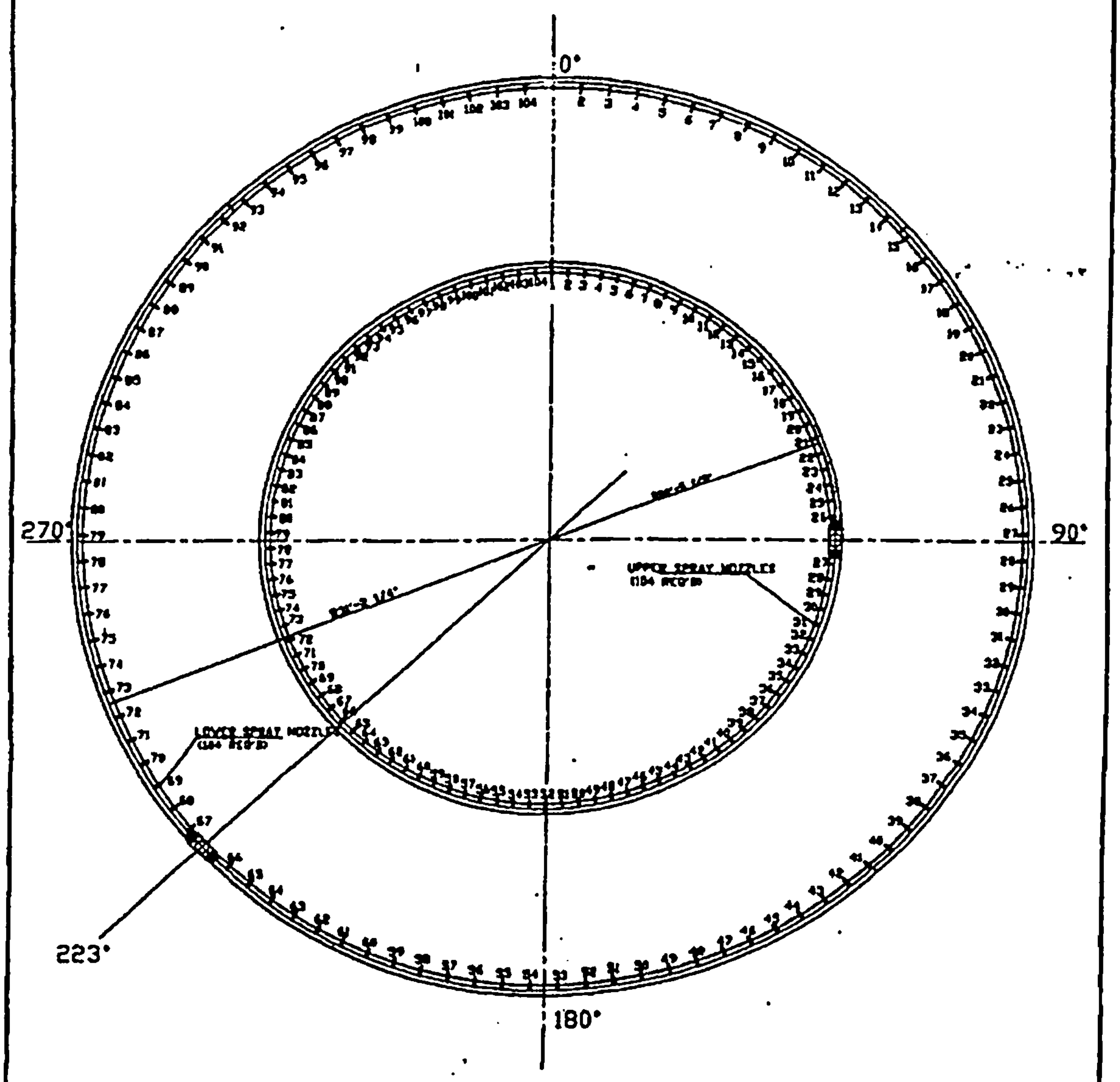
Figure: Upper and Lower Spray Header Assembly

PRECEDENT

- Perry Nuclear Power Plant – approved June 29, 2000
- Clinton Nuclear Plant – approved March 28, 2002
- North Anna Power Station, Units 1 and 2 – approved October 1, 2002
- H. B. Robinson – approved September 19, 2002
- Byron/Braidwood Nuclear Stations – approved February 20, 2003
- Surry Power Station – approved December 10, 2002
- Beaver Valley Power Station – approved February 24, 2003
- Salem Nuclear Power Plant – approved October 10, 2002
- Palisades Nuclear Station – approved February 24, 2003
- South Texas Project, Units 1 and 2, - approved August 20, 2003

FIGURE

UPPER AND LOWER SPRAY HEADER ASSEMBLY LOCATION PLAN VIEW (EL. 33'6" AND EL. 54'6")



PLAN VIEW OF PIPE HEADER @ EL 33'-6" & EL 54'-6"

(drywell)

Entergy Letter No. 2.04.033

ATTACHMENT 2

Marked-up TS Pages (2 pages)

TS 3/4.5-4
TS B3/3.5-9

LIMITING CONDITIONS FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS

B.2 Residual Heat Removal (RHR) Containment Spray

Specification:

Two RHR containment spray subsystems shall be OPERABLE.

Applicability:

Whenever irradiated fuel is in the reactor vessel, reactor coolant temperature is >212°F, and prior to startup from a cold condition.

Actions:

A. One RHR containment spray subsystem inoperable,

1. Restore RHR containment spray subsystem to OPERABLE status within 7 days.

B. Required Action and associated Completion Time not met

OR

Two RHR containment spray subsystems inoperable,

1. Be in Cold Shutdown within 24 hours.

SURVEILLANCE REQUIREMENTS

4.5 CORE AND CONTAINMENT COOLING SYSTEMS

B.2 Residual Heat Removal (RHR) Containment Spray

1. Verify each RHR containment spray subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position every 31 days.

2. Air test drywell and suppression pool (torus) headers and nozzles ~~once per 5 years.~~ following maintenance that could result in nozzle blockage.

B 3/4.5 CORE AND CONTAINMENT COOLING SYSTEMS
BASES

ACTIONS (continued)

B.1

If the inoperable RHR containment spray subsystem cannot be restored to OPERABLE status within the associated completion time or if two RHR containment spray subsystems are inoperable, the plant must be brought to a condition in which the specification does not apply. To achieve this status, the plant must be brought to Cold Shutdown within 24 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 4.5.B.2.1

Verifying the correct alignment for manual, power-operated, and automatic valves in the RHR containment spray mode flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This frequency has been shown to be acceptable based on operating experience.

SR 4.5.B.2.2

Verifying that the drywell and suppression pool (torus) headers and nozzles are free of obstructions by blowing air through them ensures an open flow path. The frequency for performance of the spray nozzle obstruction surveillance test ~~of 5 years~~ [is following maintenance that could result in nozzle blockage. This frequency] is justified due to the passive design of the nozzles and has been shown acceptable through industry operating experience. [Normal plant operation and maintenance practices are not expected to trigger the surveillance requirement. Only an unanticipated circumstance would initiate this surveillance, such as an inadvertent spray actuation or loss of foreign material control when working within the affected boundary of the system. Procedures require performance of an evaluation to determine whether a containment spray nozzle test would be required to ensure the nozzles remain unobstructed to support system Operability following these events.]

(continued)