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10 CFR 50.90

August 29, 2012

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: License Amendment Request
Revise Technical Specifications to Re-establish Residual Heat Removal System Drywell Spray Function Requirements

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon) requests an amendment to Appendix A, Technical Specifications (TS) of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively.

This submittal requests changes to the PBAPS, Unit 2 and 3, TS to re-establish the requirements for the Residual Heat Removal (RHR) Drywell Spray function in TS. The requirements for the RHR Drywell Spray function are currently contained in Technical Requirements Manual (TRM) Section 3.12, *"Residual Heat Removal (RHR) Drywell Spray."* The proposed changes involve establishing a new TS Section 3.6.2.5, *"Residual Heat Removal (RHR) Drywell Spray,"* along with a supporting Bases section, in order to facilitate relocating applicable TRM requirements and re-establishing RHR Drywell Spray function requirements in TS.

Attachment 1 provides the evaluation of the proposed changes. Attachment 2 provides the marked-up TS pages indicating the proposed changes. Attachment 3 provides the mark-up of the supporting TS Bases for information purposes.

Exelon has concluded that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92.

Exelon requests approval of the proposed amendment by August 29, 2013. Upon NRC approval, the amendment shall be implemented within 60 days of issuance.

These proposed changes have been reviewed and approved by the station's Plant Operations Review Committee and by the Nuclear Safety Review Board.

Exelon is also notifying the applicable States of this application to amend the TS by transmitting a copy of this letter and supporting attachments to the designated State Officials.

There are no regulatory commitments contained within this submittal.

If you have any questions or require additional information, please contact Richard Gropp at (610) 765-5557.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29th day of August 2012.

Respectfully,

Michael D. Jesse
Director, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1. Evaluation of Proposed Changes
2. Proposed Technical Specifications (Proposed Pages)
3. Proposed Technical Specifications Bases (Proposed Pages)

| | | |
|---|---|---|
| cc: | Regional Administrator - NRC Region I | w/ Attachments |
| | NRC Senior Resident Inspector - Peach Bottom Atomic Power Station | " |
| | NRC Project Manager, NRR - Peach Bottom Atomic Power Station | " |
| | S. T. Gray, State of Maryland | " |
| | R. R. Janati, Commonwealth of Pennsylvania | " |

**ATTACHMENT 1**

**License Amendment Request**

**Peach Bottom Atomic Power Station, Units 2 and 3**

**Docket Nos. 50-277 and 50-278**

# EVALUATION OF PROPOSED CHANGES

## Revise Technical Specifications to Re-establish Residual Heat Removal System Drywell Spray Function Requirements

## 1.0 DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon) requests an amendment to Appendix A, Technical Specifications (TS) of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively.

This submittal requests changes to the PBAPS, Unit 2 and 3, TS to re-establish the requirements for the Residual Heat Removal (RHR) Drywell Spray function in TS. The requirements for the RHR Drywell Spray function are currently contained in Technical Requirements Manual (TRM) Section 3.12, *"Residual Heat Removal (RHR) Drywell Spray."* The proposed changes involve establishing a new TS Section 3.6.2.5, *"Residual Heat Removal (RHR) Drywell Spray,"* along with a supporting Bases section, in order to facilitate relocating applicable TRM requirements and re-establishing RHR Drywell Spray function requirements in TS.

A description and evaluation of the proposed changes are provided in this attachment, which includes a discussion and description of the proposed TS changes, a safety assessment of the proposed TS changes, information supporting a finding of No Significant Hazards Consideration, and information supporting an Environmental Assessment. Attachment 2 provides the marked-up TS pages indicating the proposed changes. Attachment 3 provides the mark-up of the supporting TS Bases and is being provided for information purposes.

## 2.0 PROPOSED CHANGES

The requirements for the RHR Drywell Spray function currently reside in PBAPS TRM Section 3.12, which establishes specific guidance and criteria related to the applicability, operation, and testing for the RHR Drywell Spray function.

Exelon is proposing to re-establish the RHR Drywell Spray function requirements in PBAPS, Units 2 and 3, TS. Exelon proposes to revise the TS to include new TS Section 3.6.2.5, along with a supporting Bases section. Applicable criteria from TRM Section 3.12 will be relocated to TS Section 3.6.2.5 along with incorporating other essential information needed to establish the Limiting Condition for Operation (LCO), Applicability, Actions, and Surveillance Requirements consistent with the guidance specified in NUREG-1433, *"Standard Technical Specifications General Electric BWR/4 Plants."* The TRM requirements for the RHR Drywell Spray function will be eliminated once the TS requirements are established.

The proposed changes to the TS that will be incorporated in TS Section 3.6.2.5 are described below.

3.6 CONTAINMENT SYSTEMS

3.6.2.5 Residual Heat Removal (RHR) Drywell Spray

LCO 3.6.2.5 Two RHR drywell spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One RHR drywell spray subsystem inoperable. | A.1 | Restore RHR drywell spray subsystem to OPERABLE status. | 7 days |
| B. Two RHR drywell spray subsystems inoperable. | B.1 | Restore one RHR drywell spray subsystem to OPERABLE status. | 8 hours |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.5.1 | Verify each RHR drywell 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. | In accordance with the Surveillance Frequency Control Program. |

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.5.2 | Verify each drywell spray nozzle is unobstructed. | In accordance with the Surveillance Frequency Control Program. |

The completion times have been established based on the previous requirements that existed in the PBAPS TS prior to converting to ITS in August 1995 as well as the existing LCO 3.6.2.4 regarding the RHR Suppression Pool Spray function. The surveillance frequencies will be established in accordance with criteria and guidance in the PBAPS Surveillance Frequency Control Program (SFCP), as required by TS Section 5.5.14.

The proposed supporting Bases information associated with TS Section 3.6.2.5 is included in Attachment 3 of this submittal. The proposed Bases information includes a discussion related to Background, Applicable Safety Analyses, LCO, Applicability, Actions, Surveillance Requirements, and References.

## 3.0 BACKGROUND

Currently, the guidance and requirements related to the RHR Drywell Spray function are maintained in the TRM. There are no existing TS requirements associated with the RHR Drywell Spray function.

PBAPS, Unit 2 and 3, converted to Improved Technical Specifications (ITS) as documented in NRC Safety Evaluation Report (SER) supporting the issuance of License Amendments 210 and 214, dated August 30, 1995.

As part of the conversion to ITS, the RHR Drywell Spray requirements were removed from TS based on the following justification.

> *"The drywell spray is not credited in any DBA [Design Basis Accident] (i.e., it is not needed to function to mitigate the consequence of any design basis accidents) and it is a secondary action in emergency procedures. Therefore, drywell spray is not risk significant and can be relocated outside of the Technical Specifications. This change is consistent with NUREG-1433."*

At that time, it was determined that the requirements for the RHR Drywell Spray function did not satisfy the NRC's TS Policy Statement screening criteria for remaining in the TS and were relocated to the TRM, which is controlled in accordance with 10 CFR 50.59.

The NRC approved the changes in support of the ITS conversion in a letter dated August 30, 1995, which issued Amendment Nos. 210 and 214 for PBAPS, Units 2 and 3, respectively. The approved amendments (i.e., Nos. 210 and 214) replaced the custom TS and associated Bases with ITS, which was based on the NRC-approved guidance and criteria specified in NUREG-1433, *"Standard Technical Specifications, General Electric Plants, BWR/4,"* dated September 1992.

At the time of the ITS conversion, it had not been recognized that a Small Steam Line Break (SSLB) accident may result in higher peak drywell temperatures than that produced by Design Basis Accident (DBA) Loss of Coolant Accident (LOCA) (i.e., Recirculation Suction Line Break (RSLB)). Subsequently, however, an analysis performed in response to General Electric (GE) Service Information Letter (SIL) 636 concluded that an SSLB will result in higher containment temperatures than that of DBA LOCA. Based on this determination, the earlier justification that *"...drywell spray is not credited in any DBA (i.e., it is not needed to function to mitigate the consequence of any design basis accidents)...,"* is not correct. Although evaluated as not being required to mitigate a DBA, RHR Drywell Sprays are the primary success path for mitigating the effects of a SSLB in the drywell.

Therefore, since it has been more recently determined that RHR Drywell Spray is needed to mitigate the impact of a SSLB, the requirements of 10 CFR 50.36, Criterion 3, applies. 10 CFR 50.36(c)(2)(ii), Criterion 3, stipulates the following:

> *"A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."*

Accordingly, the requirements for the RHR Drywell Spray function are being re-established in the PBAPS, Units 2 and 3, TS. During the interim period until the proposed TS change can be reviewed and approved, PBAPS is taking action to operate as if the TS requirements were in effect.

## 4.0 TECHNICAL ANALYSIS

PBAPS UFSAR Section 4.8 describes the RHR system as a system designed to restore and maintain the coolant inventory in the reactor vessel so that the core is adequately cooled after a LOCA. The RHR system also provides cooling for the containment so that condensation of the steam resulting from the blowdown due to the design-basis LOCA is ensured.

The RHR system can be aligned in the containment cooling mode of operation. In this mode of operation, the RHR system pumps are aligned to pump water from the suppression pool through the RHR system heat exchangers, where cooling takes place by transferring heat to the High-Pressure Service Water (HPSW) system. The water pumped through the RHR system

High-Pressure Service Water (HPSW) system. The water pumped through the RHR system heat exchangers may be diverted to spray headers in the drywell and above the suppression pool (i.e., Suppression Pool Spray mode – TS 3.6.2.4). The spray headers in the drywell condense any steam that may exist in the drywell, thereby lowering containment pressure. The spray collects in the bottom of the drywell until the water level rises to the level of the pressure suppression vent lines, where it overflows and drains back to the suppression pool. Approximately 5 percent of this flow may be directed to the suppression chamber spray ring to cool any non-condensable gases collected in the free volume above the suppression pool.

PBAPS UFSAR Section 5.1 describes the primary containment as an enclosure for the reactor vessel, the reactor coolant recirculation system, and other branch connections of the reactor coolant system. The primary containment includes a drywell and a pressure suppression chamber connected by vents, isolation valves, vacuum breakers, containment cooling systems, and other service equipment. The drywell is a steel pressure vessel in the shape of a light bulb, and the pressure suppression chamber is a torus-shaped steel pressure vessel located below and encircling the drywell. The primary containment has the capability to withstand the peak transient pressure and temperatures which occur due to the postulated LOCA (i.e., RSLB - an instantaneous circumferential rupture of one of the recirculation lines), by means of rapid steam condensation, and can maintain its functional integrity indefinitely during the DBA LOCA.

In the event of a primary system piping failure within the drywell, reactor water and steam is released into the drywell atmosphere. The resulting increased drywell pressure forces a mixture of drywell atmosphere, steam, and water through the vents into the suppression pool, resulting in a pressure reduction in the drywell due to steam condensation.

In 2001, GE issued SIL No. 636 to inform Boiling Water Reactor (BWR) plants of a change in the GE method for calculating the decay heat values using the ANS 5.1-1979, *"Decay Heat Power in Light Water Reactors,"* standard. The revised method included decay heat from additional actinides and activation products. GE supported PBAPS in assessing the impact of SIL 636 relative to the design and licensing analyses potentially impacted by the revised decay heat calculation method described in SIL 636. Since PBAPS did not previously have an SSLB analysis, an analysis was performed to determine the containment pressure and temperature response for a spectrum of SSLB sizes. This included the use of ANSI 5.1-1979 (with SIL 636 decay heat plus 2-sigma adder) for decay heat analysis.

GE report GE-NE-0000-011-4483, *"Peach Bottom Atomic Power Station Units 2 and 3, SIL 636 Evaluation,"* documents the design analyses performed by GE for PBAPS following issuance of GE SIL 636, which includes the SSLB analysis. The report states the following:

> *"...The steam line breaks are the most limiting events for drywell temperature response, since steam has higher energy content than liquid. These analyses, with primary focus on the drywell temperature response, took credit for containment sprays and structural heat sinks in the drywell and the wetwell airspace. The calculated results show a maximum drywell airspace temperature of approximately 338°F, occurring during initial part of the transient before actuation of containment sprays at 10 minutes."*

GE-NE-0000-011-4483 concludes that an SSLB will result in more severe containment temperatures than the previously considered DBA LOCA (i.e., RSLB) and as described in the UFSAR.

Since it has been determined that peak drywell temperatures are higher for an SSLB rather than an RSLB and the RHR Drywell Spray function must be credited in the design basis to limit peak drywell temperature following a SSLB accident inside the drywell, Criterion 3 of 10 CFR 50.36(c)(2)(ii) applies. Specifically, Criterion 3 stipulates:

> *"A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."*

Therefore, the requirements for the RHR Drywell Spray function will be re-established in TS to ensure that this function is provided by two redundant Drywell Spray subsystems and that both subsystems are OPERABLE in applicable MODES.

## 5.0 REGULATORY ANALYSIS

### 5.1 No Significant Hazards Consideration

Exelon has concluded that the proposed changes to the Peach Bottom Atomic Power Station, Units 2 and 3, Technical Specifications (TS), to re-establish the Residual Heat Removal (RHR) Drywell Spray function do not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three (3) standards, set forth in 10 CFR 50.92, "Issuance of amendment," is provided below.

**1. Will operation of the facility in accordance with the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

Response: No.

The proposed changes to re-establish TS requirements for the RHR Drywell Spray function is necessary based on the recognition that the current design basis description in the Updated Final Safety Analysis Report (UFSAR) does not appropriately reflect the effects of a Small Steam Line Break (SSLB) accident on peak drywell temperatures. The current design basis description describes the bounding condition based on the effects of the Design Basis Accident (DBA) Loss of Coolant Accident (LOCA), which is considered the Recirculation Suction Line Break (RSLB) accident. Since peak drywell temperatures may be higher for the SSLB accident, and the RHR Drywell Spray function is credited to limit peak drywell temperature following a SSLB, the requirements of 10 CFR 50.36(c)(2)(ii) apply. Specifically, Criterion 3 stipulates:

> *"A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."*

The proposed changes to re-establish the RHR Drywell Spray requirements in TS do not introduce new equipment or new equipment operating modes, nor do the proposed changes alter existing system relationships. The proposed changes do not affect plant operation, design function, or any analysis that verifies the capability of a Structure, System, or Component (SSC) to perform a design function. There are no changes or modifications to the RHR system. The RHR system will continue to function as designed in all modes of operation, including the Drywell Spray function. There are no significant changes to procedures or training related to the operation of the RHR Drywell Spray function. Primary containment integrity is not adversely impacted and radiological consequences from the accidents analyzed in the UFSAR are not increased. Containment parameters are not increased beyond those previously evaluated and the potential for failure of the containment is not increased.

There is no adverse impact on systems designed to mitigate the consequences of accidents. The proposed changes do not increase system or component pressures, temperatures, and flowrates for systems designed to prevent accidents or mitigate the consequences of an accident. Since these conditions do not change, the likelihood of failure of SSC is not increased.

The proposed changes do not increase the likelihood of the malfunction of any SSC or impact any analyzed accident. Consequently, the probability or consequences of an accident previously evaluated are not affected.

Based on the above, Exelon concludes that the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

**2. Will operation of the facility in accordance with the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The proposed changes to re-establish the RHR Drywell Spray requirements in TS do not alter the design function or operation of any SSC. The RHR system will continue to function as designed in all modes of operation, including the Drywell Spray function. There is no new system component being installed, no new construction, and no performance of a new test or maintenance function. The proposed TS changes do not create the possibility of a new credible failure mechanism or malfunction. The proposed changes do not modify the design function or operation of any SSC. The proposed changes do not introduce new accident initiators. Primary containment integrity is not adversely impacted and radiological consequences from the accidents analyzed in the UFSAR are not increased. Containment parameters are not increased beyond those previously evaluated and the potential for failure of the containment is not increased. The proposed changes do not increase system or component pressures, temperatures, and flowrates for systems designed to prevent accidents or mitigate the consequences of an accident. Since these conditions do not change, the likelihood of failure of SSC is not increased. Consequently, the proposed changes cannot create the possibility of a new or different kind of accident from any accident previously evaluated.

Based on the above discussion, Exelon concludes that the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

**3. Will operation of the facility in accordance with the proposed amendment involve a significant reduction in a margin of safety?**

Response: No.

The proposed change to re-establish TS requirements for the RHR Drywell Spray function is necessary based on the recognition that the current design basis description in the UFSAR does not appropriately reflect the effects of a SSLB accident on peak drywell temperatures. The current design basis description describes the bounding condition based on the effects of the DBA LOCA, which is considered the RSLB accident. Since peak drywell temperatures may be higher for the SSLB, and the RHR Drywell Spray function is credited to limit peak drywell temperature following a SSLB accident, the requirements of 10 CFR 50.36(c)(2)(ii) apply. Specifically, Criterion 3 stipulates:

> *"A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."*

The proposed changes do not increase system or component pressures, temperatures, and flowrates for systems designed to prevent accidents or mitigate the consequences of an accident. Containment parameters are not increased beyond those previously evaluated and the potential for failure of the containment is not increased.

The proposed changes to re-establish the RHR Drywell Spray function in TS are needed in order to reflect the current design basis description related to the SSLB accident. The proposed changes do not exceed or alter a design basis or a safety limit for a parameter to be described or established in the UFSAR or the Renewed Facility Operating License (FOL). Consequently, the proposed changes do not result in a reduction in the margin of safety.

Based on the above, Exelon concludes that the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above evaluation of the three criteria, Exelon concludes that the proposed amendment 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/Criteria

10 CFR 50.36(c)(i) provides that TS will include Limiting Conditions for Operation (LCOs) which are *"...the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee will shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met."*

10 CFR 50.36(c)(2)(ii) specifies the following:

*"A technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria:*

*(A) Criterion 1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.*

*(B) Criterion 2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.*

*(C) Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.*

*(D) Criterion 4. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety."*

The proposed changes are consistent with current regulations and satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

NUREG-1433, *"Standard Technical Specifications General Electric BWR/4 Plants,"* contain criteria and guidance for ITS for GE BWR/4 plants. The improved ITS were developed based on the criteria in the Final Commission Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, dated July 22, 1993, which was subsequently codified by changes contained in 10 CFR 50.36. Licensees are encouraged to upgrade their TS consistent with those criteria and conforming, to the extent practical, to ITS.

The proposed changes conform to the guidance provided in NUREG-1433.

There are no changes being proposed in this amendment application such that commitments to the regulatory requirements and guidance documents above would come into question. The evaluations documented above confirm that PBAPS will continue to comply with all applicable regulatory requirements.

In conclusion, based on the considerations 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 NRC's regulations, and (3) the issuance of the amendment 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 amendment does not change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR 20 and does not change surveillance requirements. The proposed amendment involves re-establishing the RHR Drywell Spray function requirements in TS which currently reside in the TRM. 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 the individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## 7.0 PRECEDENT

Exelon proposes to re-establish the RHR Drywell Spray function in TS. Other BWRs do have similar requirements in TS governing RHR Drywell Spray operation. These plants include:

- Browns Ferry, Units 1, 2, and 3
- Columbia
- Hatch, Units 1 and 2
- Monticello, Unit 1
- Nine Mile Point, Unit 2

## 8.0 REFERENCES

1. Letter from U.S. Nuclear Regulatory Commission dated August 30, 1995, Issuance of Amendment Nos. 210 and 214.

2. NUREG-1433, Standard Technical Specifications General Electric BWR/4 Plants.

3. GE Report GE-NE-0000-011-4483, Peach Bottom Atomic Power Station Units 2 and 3, SIL 636 Evaluation.

4. NEDO-31466 Supplement 1, Technical Specification Screening Criteria Application and Risk Assessment.

5. GE SIL 636, Additional Terms Included in Decay Heat Calculations.

## Attachment 2

**Peach Bottom Atomic Power Station, Units 2 and 3**

**NRC Docket Nos. 50-277 and 50-278**

**Revise Technical Specifications to Re-establish Residual Heat Removal System Drywell Spray Function Requirements**

**Proposed Technical Specifications**

| Unit 2 | Unit 3 |
|---|---|
| ii | ii |
| 3.6-30a | 3.6-30a |
| 3.6-30b | 3.6-30b |

(continued)

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.5 Residual Heat Removal (RHR) Drywell Spray

LCO 3.6.2.5 Two RHR drywell spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One RHR drywell spray subsystem inoperable. | A.1 | Restore RHR drywell spray subsystem to OPERABLE status. | 7 days |
| B. Two RHR drywell spray subsystems inoperable. | B.1 | Restore one RHR drywell spray subsystem to OPERABLE status. | 8 hours |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in Mode 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.5.1 | Verify each RHR drywell 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. | In accordance with the Surveillance Frequency Control Program. |
| SR 3.6.2.5.2 | Verify each drywell spray nozzle is unobstructed. | In accordance with the Surveillance Frequency Control Program. |

(continued)

## 3.6 CONTAINMENT SYSTEMS

### 3.6.2.5 Residual Heat Removal (RHR) Drywell Spray

LCO 3.6.2.5 Two RHR drywell spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One RHR drywell spray subsystem inoperable. | A.1 | Restore RHR drywell spray subsystem to OPERABLE status. | 7 days |
| B. Two RHR drywell spray subsystems inoperable. | B.1 | Restore one RHR drywell spray subsystem to OPERABLE status. | 8 hours |
| C. Required Action and associated Completion Time not met. | C.1 | Be in MODE 3. | 12 hours |
| | AND | | |
| | C.2 | Be in Mode 4. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.6.2.5.1 | Verify each RHR drywell 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. | In accordance with the Surveillance Frequency Control Program. |
| SR 3.6.2.5.2 | Verify each drywell spray nozzle is unobstructed. | In accordance with the Surveillance Frequency Control Program. |

## Attachment 3

**Peach Bottom Atomic Power Station, Units 2 and 3**

**NRC Docket Nos. 50-277 and 50-278**

**Revise Technical Specifications to Re-establish Residual Heat Removal System Drywell Spray Function Requirements**

**Proposed Technical Specifications Bases**

| Unit 2 | Unit 3 |
|---|---|
| ii | ii |
| B 3.6-63a | B 3.6-63a |
| B 3.6-63b | B 3.6-63b |
| B 3.6-63c | B 3.6-63c |
| B 3.6-63d | B 3.6-63d |

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.5 Residual Heat Removal (RHR) Drywell Spray

BASES

BACKGROUND

Drywell Spray is a mode of the RHR system which may be initiated under post accident conditions to reduce the temperature and pressure of the primary containment atmosphere. The Drywell Spray function is credited in design basis analyses to limit peak drywell temperature following a steam line break inside of the Drywell and may be used to mitigate other loss of coolant accidents inside of the Drywell. This function is provided by two redundant Drywell Spray subsystems. The purpose of this LCO is to ensure that both subsystems are OPERABLE in applicable MODES.

The RHR System has two loops with each loop consisting of two motor driven pumps, two heat exchangers, and associated piping and valves. There are two RHR Drywell spray subsystems per RHR System loop. The four RHR drywell spray subsystems are manually, initiated and independently controlled. The four RHR drywell spray subsystems perform the drywell spray function by circulating water from the suppression pool through the RHR heat exchangers and discharging the cooled suppression pool water into the drywell air space through the drywell spray sparger and spray nozzles. The spray then effects a temperature and pressure reduction through the combined effects of evaporative and convective cooling, depending on the drywell atmosphere. If the atmosphere is superheated, a rapid evaporative cooling process will ensue. If the environment in the drywell is saturated, temperature and pressure will be reduced via a convective cooling process.

Each drywell spray sparger line is common to the two RHR drywell spray subsystems in an RHR System loop. If required, a small portion of the spray flow can be directed to the suppression pool spray sparger and spray nozzles. High Pressure Service Water, circulating through the tube side of the heat exchangers, exchanges heat with the suppression pool water on the shell side of the heat exchangers and discharges this heat to the external heat sink.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

Reference 2 contains the results of analyses used to predict primary containment pressure and temperature response following a spectrum of small steam line break sizes. Steam line breaks are the most limiting events for drywell temperature response, since steam has higher energy content than liquid. These analyses, with primary focus on the drywell temperature response, take credit for containment sprays and structural heat sinks in the drywell and the suppression pool airspace. These analyses demonstrate that, with credit for containment spray (drywell and suppression pool), drywell temperature is maintained within limits for Environmental Qualification (EQ) of equipment located in the drywell for the analyzed spectrum of small steam line breaks. The RHR Drywell Spray System satisfies Criterion 3 of the NRC Policy Statement.

LCO

In the event of a small steam line break in the drywell, a minimum of one RHR drywell spray subsystem is credited in design analyses to mitigate the rise in drywell temperature and pressure caused by the steam line break, and to maintain the primary containment peak temperature and pressure below the design limits (Ref. 2). To ensure that these requirements are met, two RHR drywell spray subsystems (one in each loop) must be OPERABLE with power from two safety related independent power supplies. (The two subsystems must be in separate loops since the drywell spray sparger line valves are common to both subsystems in a loop.) Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR drywell spray subsystem is OPERABLE when one of the pumps, the associated heat exchanger, a HPSW System pump capable of providing cooling to the heat exchanger and associated piping, valves, instrumentation, and controls are OPERABLE.

APPLICABILITY

In MODES 1, 2, and 3, a steam line break in the drywell could cause a rise in primary containment temperature and pressure. In MODES 4 and 5, the probability and consequences of steam line breaks are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining RHR drywell spray subsystems OPERABLE is not required in MODE 4 or 5.

(continued)

BASES (continued)

ACTIONS

A.1

With one RHR drywell spray subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE RHR drywell spray subsystem is adequate to mitigate the effects of a steam line break in the drywell. However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in reduced ability to mitigate the temperature rise associated with a steam line break in the drywell, for which drywell sprays are credited. The 7 day Completion Time was chosen in light of the redundant RHR drywell spray capabilities afforded by the OPERABLE subsystem and the low probability of a steam line break in the drywell occurring during this period.

B.1

With both RHR drywell spray subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 8 hours. In this Condition, there is a substantial loss of the ability to mitigate the temperature rise associated with a steam line break in the drywell, for which drywell sprays are credited. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a steam line break in the drywell and because alternative methods to remove heat from primary containment are available.

C.1 and C.2

If the inoperable RHR drywell spray subsystem(s) cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and MODE 4 within 36 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.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR drywell 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 drywell 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 Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.6.2.5.2

This Surveillance is performed to verify that the spray nozzles are not obstructed and that flow will be provided when required. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Sections 5.2 and 14.6.3.

2. GE-NE-0000-0011-4483, Project Task Report, Peach Bottom Atomic Power Station, Units 2 and 3, SIL 636 Evaluation.

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.5 Residual Heat Removal (RHR) Drywell Spray

BASES

BACKGROUND

Drywell Spray is a mode of the RHR system which may be initiated under post accident conditions to reduce the temperature and pressure of the primary containment atmosphere. The Drywell Spray function is credited in design basis analyses to limit peak drywell temperature following a steam line break inside of the Drywell and may be used to mitigate other loss of coolant accidents inside of the Drywell. This function is provided by two redundant Drywell Spray subsystems. The purpose of this LCO is to ensure that both subsystems are OPERABLE in applicable MODES.

The RHR System has two loops with each loop consisting of two motor driven pumps, two heat exchangers, and associated piping and valves. There are two RHR Drywell spray subsystems per RHR System loop. The four RHR drywell spray subsystems are manually, initiated and independently controlled. The four RHR drywell spray subsystems perform the drywell spray function by circulating water from the suppression pool through the RHR heat exchangers and discharging the cooled suppression pool water into the drywell air space through the drywell spray sparger and spray nozzles. The spray then effects a temperature and pressure reduction through the combined effects of evaporative and convective cooling, depending on the drywell atmosphere. If the atmosphere is superheated, a rapid evaporative cooling process will ensue. If the environment in the drywell is saturated, temperature and pressure will be reduced via a convective cooling process.

Each drywell spray sparger line is common to the two RHR drywell spray subsystems in an RHR System loop. If required, a small portion of the spray flow can be directed to the suppression pool spray sparger and spray nozzles. High Pressure Service Water, circulating through the tube side of the heat exchangers, exchanges heat with the suppression pool water on the shell side of the heat exchangers and discharges this heat to the external heat sink.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

Reference 2 contains the results of analyses used to predict primary containment pressure and temperature response following a spectrum of small steam line break sizes. Steam line breaks are the most limiting events for drywell temperature response, since steam has higher energy content than liquid. These analyses, with primary focus on the drywell temperature response, take credit for containment sprays and structural heat sinks in the drywell and the suppression pool airspace. These analyses demonstrate that, with credit for containment spray (drywell and suppression pool), drywell temperature is maintained within limits for Environmental Qualification (EQ) of equipment located in the drywell for the analyzed spectrum of small steam line breaks. The RHR Drywell Spray System satisfies Criterion 3 of the NRC Policy Statement.

LCO

In the event of a small steam line break in the drywell, a minimum of one RHR drywell spray subsystem is credited in design analyses to mitigate the rise in drywell temperature and pressure caused by the steam line break, and to maintain the primary containment peak temperature and pressure below the design limits (Ref. 2). To ensure that these requirements are met, two RHR drywell spray subsystems (one in each loop) must be OPERABLE with power from two safety related independent power supplies. (The two subsystems must be in separate loops since the drywell spray sparger line valves are common to both subsystems in a loop.) Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR drywell spray subsystem is OPERABLE when one of the pumps, the associated heat exchanger, a HPSW System pump capable of providing cooling to the heat exchanger and associated piping, valves, instrumentation, and controls are OPERABLE.

APPLICABILITY

In MODES 1, 2, and 3, a steam line break in the drywell could cause a rise in primary containment temperature and pressure. In MODES 4 and 5, the probability and consequences of steam line breaks are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining RHR drywell spray subsystems OPERABLE is not required in MODE 4 or 5.

(continued)

BASES (continued)

ACTIONS

A.1

With one RHR drywell spray subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE RHR drywell spray subsystem is adequate to mitigate the effects of a steam line break in the drywell. However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in reduced ability to mitigate the temperature rise associated with a steam line break in the drywell, for which drywell sprays are credited. The 7 day Completion Time was chosen in light of the redundant RHR drywell spray capabilities afforded by the OPERABLE subsystem and the low probability of a steam line break in the drywell occurring during this period.

B.1

With both RHR drywell spray subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 8 hours. In this Condition, there is a substantial loss of the ability to mitigate the temperature rise associated with a steam line break in the drywell, for which drywell sprays are credited. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a steam line break in the drywell and because alternative methods to remove heat from primary containment are available.

C.1 and C.2

If the inoperable RHR drywell spray subsystem(s) cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and MODE 4 within 36 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.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR drywell 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 drywell 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.

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SR 3.6.2.5.2

This Surveillance is performed to verify that the spray nozzles are not obstructed and that flow will be provided when required. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

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1. UFSAR, Sections 5.2 and 14.6.3.

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