Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion

February 25, 2005

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD20852-2738

Serial No. 05-049
NSS&L/DF R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
LICENSE AMENDMENT REQUEST (LBDCR 05-MP2-001)
TRISODIUM PHOSPHATE TECHNICAL SPECIFICATION

Pursuant to 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC) hereby requests to amend Operating License DPR-65 for Millstone Power Station Unit 2 to modify the Technical Specification Surveillance Requirement for trisodium phosphate (TSP) to remove the granularity term and chemical detail. In addition, the proposed change will increase the allowed outage time from 48 to 72 hours. The associated Technical Specification Bases section will be updated accordingly.

The proposed amendment does not involve a significant impact on public health and safety and does not involve a Significant Hazards Consideration pursuant to the provisions of 10 CFR 50.92 (see Significant Hazards Consideration in Attachment 1). The Site Operations Review Committee and the Management Safety Review Committee have reviewed and concurred with the determinations.

DNC is requesting NRC staff review and approval of the proposed change by January 2006 with an implementation time of 60 days from issuance.

In accordance with 10CFR50.91(b), a copy of this license amendment request is being provided to the State of Connecticut.

If you should have any questions regarding this submittal, please contact Mr. Paul R. Willoughby at (804) 273-3572.

Very truly yours,

Eugene S. Grecheck
Vice President – Nuclear Support Services

Attachments: (3)

1. Evaluation of Proposed License Amendment
2. Marked-Up Pages
3. Re-typed Pages

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
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COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck who is Vice President – Nuclear Support Services, of Dominion Nuclear Connecticut, Inc. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 25th day of February, 2005.

My Commission Expires: May 31, 2006.

Vicki L. Hull
Notary Public

(SEAL)

ATTACHMENT 1

LICENSE AMENDMENT REQUEST (LBDCR 05-MP2-001)
TRISODIUM PHOSPHATE TECHNICAL SPECIFICATION

EVALUATION OF PROPOSED LICENSE AMENDMENT

MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.

Evaluation of Proposed License Amendment

1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC) hereby requests to amend Operating License DPR-65 for Millstone Power Station Unit 2 to modify the Technical Specification Surveillance Requirement for trisodium phosphate (TSP) to remove the granularity term and chemical detail. Specifically, the proposed change will remove the words "granular" and "dodecahydrate". In addition, the proposed change will increase the allowed outage time (AOT) from 48 to 72 hours. Accordingly, the associated technical specification bases section will be updated with detail regarding TSP moisture content.

This change is being requested to reflect industry operating experience and plant specific experience. A similar change to delete "granular" and "dodecahydrate" from the TSP surveillance was proposed as Standard Technical Specification Change Traveler No. TSTF-128 and was approved for incorporation into NUREG 1432, "Standard Technical Specifications for Combustion Engineering Plants," Revision 2. The proposed increase in the AOT for TSP is also in agreement with NUREG 1432.

2.0 PROPOSED CHANGE

Change 1

The proposed amendment will modify the action statement for TS 3.5.5 as follows:

Current

With the quantity of TSP less than required, restore the TSP quantity within 48 hours, or be in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours.

Proposed

With the quantity of TSP less than required, restore the TSP quantity within 72 hours, or be in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours.

Change 2

The proposed amendment will modify surveillance requirement (SR) 4.5.5.1 as follows:

Current

Verify that the TSP baskets contain ≥ 282 ft^3 of granular trisodium phosphate dodecahydrate at least once per 18 months.

Proposed

Verify that the TSP baskets contain ≥ 282 ft^3 of TSP at least once per 18 months.

Change 3

The Technical Specification Bases will be revised to reflect the proposed specification changes and are provided for information in Attachment 2. NUREG 1432, "Standard Technical Specifications for Combustion Engineering Plants," Revision 3, will be used as a basis for the technical specification bases changes. Changes to the bases are controlled in accordance with the Technical Specification Bases Control Program (Technical Specification 6.23).

3.0 BACKGROUND

3.1 Trisodium Phosphate (TSP) Description

Five baskets containing TSP are located on the -22'6" elevation of containment. These baskets contain a minimum total volume of 282 ft^3 of TSP. A discussion regarding the TSP baskets is contained in the FSAR, Section 6.2.2.1. The TSP volume is based on the need to neutralize the maximum volume and concentration of borated water accumulating in the sump from all potential sources of borated water. Additionally, hydrochloric acid and nitric acid can be produced in a post-accident atmosphere from the degradation of electric cable insulation and radiolysis of sump water. The TSP assists in neutralizing these acids as well. The volume of TSP in the baskets is enough to raise the pH of the post-accident sump water to greater than or equal to 7. The pH of the containment sump water following a loss of coolant accident is described in FSAR Sections 6.3 and 6.4. The pH must be controlled to limit material degradation, in particular, stress corrosion cracking of austenitic stainless steel components in containment in the post-accident environment.

Maintaining the pH of the sump water at 7 or greater is necessary for iodine retention in the radiological analysis for a loss of coolant accident.

3.2 Reason for Proposed Amendment

This change is being requested to remove ambiguity in the requirements of SR 4.5.5.1. Deleting the terms "granular" and "dodecahydrate" from SR 4.5.5.1 more appropriately represents the intention of the surveillance, which is to verify the TSP volume is within limits.

The portion of this proposed license amendment that modifies the allowed outage time from 48 to 72 hours is being requested to align with the allowed outage time used in the industry standard (NUREG 1432).

4.0 TECHNICAL ANALYSIS

4.1 Details of the Proposed Amendment

Change 1

The proposed amendment will modify the limiting condition for operation to increase the allowed outage time from 48 to 72 hours. Seventy-two hours is considered acceptable based on the low probability of a design basis accident occurring during the allowed outage time. This change is not considered to impact plant safety. In addition, the proposed 72 hour allowed outage time agrees with the required completion time from the Standard Technical Specifications for Combustion Engineering plants, NUREG 1432, Revision 3.

Change 2

The proposed amendment will modify surveillance requirement SR 4.5.5.1 to remove the details related to the consistency and type of TSP by removing the terms "granular" and "dodecahydrate." SR 4.5.5.1 verifies that the correct volume of TSP exists in the TSP baskets. The required volume of TSP to be verified by this surveillance is not being modified by this proposed amendment. An administrative change to abbreviate trisodium phosphate to TSP has also been included for consistency within the wording of the specification and has no impact to the performance of the surveillance.

Deleting the term "granular" removes the perception that the granularity or consistency of the TSP is a required characteristic to be verified during performance of this surveillance. Industry experience indicates that TSP has the tendency to agglomerate. Past testing on compacted TSP indicates that even if the TSP crystals become compressed and partially fused together, rapid dissolution is still assured. Compaction testing is considered to bound possible agglomeration of TSP.

The ability of TSP to raise post-accident sump water to a pH of 7 or greater is not changed based on agglomeration of TSP. Verifying the capability of the TSP to effectively control pH is covered by a separate surveillance requirement (SR 4.5.5.2), which does not include a requirement for granular TSP. Plant specific surveillance results for SR 4.5.5.2 currently indicate that the TSP in containment can effectively control pH to the required levels credited in the accident analysis. It should also be noted that the TSP in containment is confirmed to be of the TSP dodecahydrate form.

TSP with a high moisture content is recommended for use inside containment. Hydrated TSP can be found in the industry with varying levels of moisture content. For example, TSP decahydrate (10 moles of water) and TSP dodecahydrate (12 moles of water) have different moisture content, however, both fall within the 45 to 57% moisture range recommended by the industry for use in high humidity environments. Accordingly, deleting the reference to "dodecahydrate" and establishing a required moisture range for the TSP in the technical specification bases section will allow flexibility should the need arise to add TSP in the future.

Change 3

The associated technical specification bases section will be modified to reflect the two changes discussed above. In addition, due to the fact that sump water pH of 7 or greater is assumed in our radiological analysis, proposed language adopted from NUREG 1432 has also been added as an update. The term "representative" has been deleted from the bases to prevent misinterpretation of the TSP sampling technique. The sampling process for TSP is described in approved station procedures. Removing the term "representative" will remove ambiguity in the interpretation of what constitutes the approved method for obtaining the sample. The requirement that the sample is taken from one of the TSP baskets in containment is not compromised by this deletion and remains in the bases.

4.2 Summary

The proposed amendment will remove the term "granular" and "dodecahydrate" from the surveillance that verifies that the TSP volume in containment is within technical specification limits. The proposed amendment will clarify that the granularity and type of TSP are not characteristics intended to be verified during the performance of this surveillance. TSP granularity does not impact the ability of the TSP to adequately control pH during post-accident conditions as assumed in the accident analysis. TSP moisture content is a necessary requirement and will be retained in the technical specification bases. Aligning the allowed outage time for an incorrect volume of TSP with the emergency core cooling technical specifications is not considered to impact plant safety and is in agreement with industry guidance and plant experience.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

The proposed amendment modifies the Millstone Unit 2 Technical Specifications surveillance requirement for verifying that the volume of trisodium phosphate (TSP) in containment is within specified limits. Specifically, the terms "granular" and "dodecahydrate" as they are used to define TSP are being deleted. Removing this detail and maintaining the required moisture content for TSP in the technical specification bases section is in accordance with industry guidelines and will clarify the surveillance. The granularity of TSP does not impact its ability to perform its intended safety function. TSP is used to neutralize acids in the containment sump water that are expected to be generated during post-accident conditions and also to facilitate conditions for iodine retention during long-term recirculation. In addition, the proposed change extends the allowed outage time from 48 to 72 hours based on plant experience and industry guidelines.

Dominion Nuclear Connecticut, Inc. (DNC) has evaluated whether or not a Significant Hazards Consideration (SHC) is involved with the proposed changes by addressing the three standards set forth in 10 CFR 50.92(c) as discussed below.

Criterion 1:

Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The TSP stored in containment is designed to buffer the acids expected to be produced after a loss of coolant accident and is credited in the radiological analysis for iodine retention. The type and amount of TSP is not considered to be an initiator of any analyzed accident. The proposed change does not modify any plant equipment and only clarifies language used in a TSP surveillance requirement which does not impact any failure modes that could lead to an accident. Removing the detail for TSP granularity and type from the surveillance and increasing the allowed outage time, does not change the solubility or buffering capability of the TSP. Therefore this change does not impact the consequences of any accident. Based on this discussion, the proposed amendment does not increase the probability or consequence of an accident previously evaluated.

Criterion 2:

Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The TSP chemical in containment is not being modified in any way by this proposed amendment. There is no impact on the capability of the TSP to increase the sump water pH to 7 or greater after a loss of coolant accident. No parameters of the TSP baskets are being modified and no changes are being made to the method in which borated water is delivered to the sump. The proposed changes to remove the terms "granular" and "dodecahydrate", and to increase the allowed outage time do not introduce any new failure modes for the containment sump system. Removing the detail from the surveillance requirement will clarify that the intended parameter to be measured is volume. The proposed amendment does not introduce accident initiators or malfunctions that would cause a new or different kind of accident. Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Criterion 3:

Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The is no significant reduction in the established margin of safety posed by the proposed change to remove detail from the TSP surveillance requirement and increase the allowed outage time. The TSP in containment provides the necessary pH control following a loss of coolant accident to assure iodine retention. Consequently iodine concentrations in the containment atmosphere are maintained within the assumptions of the offsite dose calculations. The proposed change does not introduce any new requirements for the TSP chemical used in containment that would impact a margin of safety. The allowed outage time of 72 hours is consistent with other emergency core cooling components which are also required to perform during a loss of coolant accident. Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

In summary, DNC concludes that the proposed amendment does not represent a significant hazards consideration under the standards set forth in 10 CFR 50.92(c).

5.2 Applicable Regulatory Requirements/Criteria

The applicable design criterion for fission product removal is contained in NUREG 0800, Revision 2, Section 6.5.2, Subsection II.1.g, and specifies that the pH of all solutions in the containment sump and all additives for reactivity control, fission product removal, or other purposes should be maintained at a level high enough to assure that significant long-term iodine re-evolution does not occur. Long-term iodine retention may be assumed only when the equilibrium sump solution pH, after mixing and dilution with the primary coolant and ECCS injection is above 7. The proposed SR modification does not impact conformance to the applicable NUREG 0800 requirement since the capability of the TSP to perform its function is not affected. Additionally, the proposed extension of the allowed outage time also does not impact the TSP to raise sump water pH to that level required in the accident analysis.

In conclusion, based on the considerations discussed above: (1) there is reasonable assurance 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 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

DNC has determined that the proposed amendment would change requirements with respect to use of a facility component located within the restricted area, as defined by 10 CFR 20, or an inspection or surveillance requirement. DNC has evaluated the proposed change and has determined that the 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 off site, 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 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

Serial No. 05-049
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ATTACHMENT 2

LICENSE AMENDMENT REQUEST (LBDCR 05-MP2-001)
TRISODIUM PHOSPHATE TECHNICAL SPECIFICATION

MARKED-UP PAGES

MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.

EMERGENCY CORE COOLING SYSTEMS

TRISODIUM PHOSPHATE (TSP)

LIMITING CONDITION FOR OPERATION

3.5.5 The TSP baskets shall contain ≥282 ft^3 of active TSP.

APPLICABILITY: MODES 1, 2, and 3

ACTION:

With the quantity of TSP less than required, restore the TSP quantity within 72 hours, or be in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.5.1 Verify that the TSP baskets contain ≥282 ft^3 of ~~granular trisodium phosphate dodecahydrate~~ TSP at least once per 18 months.

4.5.5.2 Verify that a sample from the TSP baskets provides adequate pH adjustment of borated water at least once per 18 months.

ATTACHMENT 3

LICENSE AMENDMENT REQUEST (LBDCR 05-MP2-001)
TRISODIUM PHOSPHATE TECHNICAL SPECIFICATION

RE-TYPED PAGE

MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.

TRISODIUM PHOSPHATE (TSP)

LIMITING CONDITION FOR OPERATION

3.5.5 The TSP baskets shall contain ≥282 ft^3 of active TSP.

APPLICABILITY: MODES 1, 2, and 3

ACTION:

With the quantity of TSP less than required, restore the TSP quantity within 72 hours, or be in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.5.1 Verify that the TSP baskets contain ≥282 ft^3 of TSP at least once per 18 months.

4.5.5.2 Verify that a sample from the TSP baskets provides adequate pH adjustment of borated water at least once per 18 months.

For Information Only - TS Bases Change

~~June 22, 1998~~

3/4.5.5 TRISODIUM PHOSPHATE (TSP)

INSERT A

The trisodium phosphate (TSP) ~~dodecahydrate~~ stored in dissolving baskets located in the containment basement is provided to minimize the possibility of corrosion cracking of certain metal components during operation of the ECCS following a LOCA. The TSP provides this protection by dissolving in the sump water and causing its final pH to be raised $\geq$ 7.0. This determination assumes the RCS, the SI tanks, and the RWST are at a maximum boron concentration of 2400 ppm and the BASTs are at a maximum boron concentration of 3.5 weight percent.

The requirement to dissolve a ~~representative~~ sample of TSP in a sample of borated water provides assurance the stored TSP will dissolve in borated water ~~at postulated post-LOCA temperatures.~~ This test is performed by submerging a ~~representative~~ sample of 0.6662 $\pm$ 0.0266 grams of TSP from one of the baskets in containment in 250 $\pm$ 10 milliliters of water at a boron concentration of 2482 $\pm$ 20 ppm, and a temperature of 77 $\pm$ 5°F. Without agitation, the solution is allowed to stand for four hours. The liquid is then decanted, mixed, and the pH measured. The pH must be $\geq$ 7.0. The ~~representative~~ TSP sample weight is based on the minimum required TSP mass of 12,042 pounds, which at the manufactured density corresponds to the minimum volume of 223 ft^3 (The minimum Technical Specification requirement of 282 ft^3 is based on 223 ft^3 of TSP for boric acid neutralization and 59 ft^3 of TSP for neutralization of hydrochloric and nitric acids.), and the maximum sump water volume (at 77°F) following a LOCA of 2,046,441 liters, normalized to buffer a 250 $\pm$ 10 milliliter sample. The boron concentration of the test water is representative of the maximum possible concentration in the sump following a LOCA. Agitation of the test solution is prohibited during TSP dissolution since an adequate standard for the agitation intensity cannot be specified. The dissolution time of four hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the containment sump following a LOCA, rapid mixing will occur, significantly decreasing the actual amount of time before the required pH is achieved. The solution is decanted after the four hour period to remove any undissolved TSP prior to mixing and pH measurement. Mixing is necessary for proper operation of the pH instrument.

For Information Only - TS Bases Change

TSP
B 3.5.5

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.5 Trisodium Phosphate (TSP)

BASES

BACKGROUND

Trisodium phosphate (TSP) is placed on the floor or in the sump of the containment building to ensure that iodine, which may be dissolved in the recirculated reactor cooling water following a loss of coolant accident (LOCA), remains in solution. TSP also helps inhibit stress corrosion cracking (SCC) of austenitic stainless steel components in containment during the recirculation phase following an accident.

Insert A

Fuel that is damaged during a LOCA will release iodine in several chemical forms to the reactor coolant and to the containment atmosphere. A portion of the iodine in the containment atmosphere is washed to the sump by containment sprays. The emergency core cooling water is borated for reactivity control. This borated water causes the sump solution to be acidic. In a low pH (acidic) solution, dissolved iodine will be converted to a volatile form. The volatile iodine will evolve out of solution into the containment atmosphere, significantly increasing the levels of airborne iodine. The increased levels of airborne iodine in containment contribute to the radiological releases and increase the consequences from the accident due to containment atmosphere leakage.

After a LOCA, the components of the core cooling and containment spray systems will be exposed to high temperature borated water. Prolonged exposure to the core cooling water combined with stresses imposed on the components can cause SCC. The SCC is a function of stress, oxygen and chloride concentrations, pH, temperature, and alloy composition of the components. High temperatures and low pH, which would be present after a LOCA, tend to promote SCC. This can lead to the failure of necessary safety systems or components.

Adjusting the pH of the recirculation solution to levels above 7.0 prevents a significant fraction of the dissolved iodine from converting to a volatile form. The higher pH thus decreases the level of airborne iodine in containment and reduces the radiological consequences from containment atmosphere leakage following a LOCA. Maintaining the solution pH above 7.0 also reduces the occurrence of SCC of austenitic stainless steel components in containment. Reducing SCC reduces the probability of failure of components.

For Information Only - TS Bases Chg (TSP B 3.5.5)

Insert A (cont'd)

BACKGROUND (continued)

TSP is employed as a passive form of pH control for post LOCA containment spray and core cooling water. Baskets of TSP are placed on the floor or in the sump of the containment building to dissolve from released reactor coolant water and containment sprays after a LOCA. Recirculation of the water for core cooling and containment sprays then provides mixing to achieve a uniform solution pH. The hydrated form (45-57% moisture) of TSP is used because of the high humidity in the containment building during normal operation. Since the TSP is hydrated, it is less likely to absorb large amounts of water from the humid atmosphere and will undergo less physical and chemical change than the anhydrous form of TSP.

APPLICABLE SAFETY ANALYSES

The LOCA radiological consequences analysis takes credit for iodine retention in the sump solution based on the recirculation water pH being ≥ 7.0. The radionuclide releases from the containment atmosphere and the consequences of a LOCA would be increased if the pH of the recirculation water were not adjusted to 7.0 or above.

~~TSP satisfies Criterion 3 of the 10 CFR 50.36(c)(2)(ii).~~

~~LCO~~ Limiting Condition for Operation

The TSP is required to adjust the pH of the recirculation water to ≥ 7.0 after a LOCA. A pH ≥ 7.0 is necessary to prevent significant amounts of iodine released from fuel failures and dissolved in the recirculation water from converting to a volatile form and evolving into the containment atmosphere. Higher levels of airborne iodine in containment may increase the release of radionuclides and the consequences of the accident. A pH ≥ 7.0 is also necessary to prevent SCC of austenitic stainless steel components in containment. SCC increases the probability of failure of components.

The required amount of TSP is based upon the extreme cases of water volume and pH possible in the containment sump after a large break LOCA. The minimum required volume is the volume of TSP that will achieve a sump solution pH of ≥ 7.0 when taking into consideration the maximum possible sump water volume and the minimum possible pH. The amount of TSP needed in the containment building is based on the mass of TSP required to achieve the desired pH. However, a required volume is specified, rather than mass, since it is not feasible to weigh the entire amount of TSP in containment. The minimum required volume is based on the manufactured density of TSP. Since TSP can have a tendency to agglomerate from high humidity in the containment building, the density may increase and the volume decrease during normal plant operation. Due to possible agglomeration and increase in density, estimating the minimum volume of TSP in containment is conservative with respect to achieving a minimum required pH.

For Information Only - TS Base Change

Insert A (cont'd)

BASES

APPLICABILITY

In MODES 1, 2, and 3, the RCS is at elevated temperature and pressure, providing an energy potential for a LOCA. The potential for a LOCA results in a need for the ability to control the pH of the recirculated coolant.

In MODES 4, 5, and 6, the potential for a LOCA is reduced or nonexistent, and TSP is not required.

ACTIONS

A.1

If it is discovered that the TSP in the containment building sump is not within limits, action must be taken to restore the TSP to within limits. During plant operation the containment sump is not accessible and corrections may not be possible.

The ~~C~~completion ~~T~~time of 72 hours is allowed for restoring the TSP within limits, ~~where possible,~~ because 72 hours is the same time allowed for restoration of other ECCS components.

B.1 and B.2

If the TSP cannot be restored within limits within the 72-hour ~~C~~completion ~~T~~time ~~of Required Action A.1~~, the plant must be brought to a MODE in which the LCO does not apply. The specified Completion Times for reaching MODES 3 and 4 ~~are those used throughout the Technical Specifications; they~~ were chosen to allow reaching the specified conditions from full power in an orderly manner ~~and~~ without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

Surveillance Requirement 4.5.5.1

Periodic determination of the volume of TSP in containment must be performed due to the possibility of leaking valves and components in the containment building that could cause dissolution of the TSP during normal operation. A ~~F~~frequency of 18 months is required to determine visually that a minimum of [291] cubic feet is contained in the TSP baskets. This requirement ensures that there is an adequate volume of TSP to adjust the pH of the post LOCA sump solution to a value ≥ 7.0.

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The periodic verification is required every 18 months, since access to the TSP baskets is only feasible during outages, and normal fuel cycles are scheduled for 18 months. Operating experience has shown this ~~S~~surveillance ~~F~~frequency acceptable due to the margin in the volume of TSP placed in the containment building.

For Information Only – TS Bases Change

TSP B 3.5.5

Insert A (cont'd)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.5.2 Surveillance Requirement 4.5.5.2

Testing must be performed to ensure the solubility and buffering ability of the TSP after exposure to the containment environment. A representative sample of [ ] grams of TSP from one of the baskets in containment is submerged in 1.0 gal ± 0.05 gal of water at a boron concentration of [ ] ppm and at the standard temperature of 25°C ± 5°C. Without agitation, the solution pH should be raised to ≥ 7 within 4 hours. The representative sample weight is based on the minimum required TSP weight of [ ] kilograms, which at manufactured density corresponds to the minimum volume of [ ] cubic ft, and maximum possible post LOCA sump volume of [ ] gallons, normalized to buffer a 1.0 gal sample. The boron concentration of the test water is representative of the maximum possible boron concentration corresponding to the maximum possible post LOCA sump volume. Agitation of the test solution is prohibited, since an adequate standard for the agitation intensity cannot be specified. The test time of 4 hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the post LOCA containment sump, rapid mixing would occur, significantly decreasing the actual amount of time before the required pH is achieved. This would ensure compliance with the Standard Review Plan requirement of a pH ≥ 7.0 by the onset of recirculation after a LOCA.

REFERENCES None.

Passing this test verifies the TSP is active and provides assurance that the stored TSP will dissolve in borated water at postulated post-LOCA temperatures.