Beaver Valley Power Station
P.O. Box 4
Shippingport, PA 15077

Paul A. Harden
Site Vice President

724-682-5234
Fax: 724-643-8069

May 27, 2011

L-11-141

10 CFR 50.90

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

SUBJECT:
Beaver Valley Power Station, Unit Nos. 1 and 2
BVPS-1 Docket No. 50-334, License No. DPR-66
BVPS-2 Docket No. 50-412, License No. NPF-73
License Amendment Request No. 10-021, Replacement of Beaver Valley Power Station Unit No. 1 Spray Additive System by Containment Sump pH Control System

Pursuant to 10 CFR 50.90, FirstEnergy Nuclear Operating Company (FENOC) hereby requests an amendment to the operating licenses for Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2 respectively). The proposed amendments would modify Technical Specifications (TS) to allow the BVPS-1 containment spray additive (sodium hydroxide) to be replaced by sodium tetraborate. An administrative change to the BVPS-2 license is requested because the TS for the BVPS-2 containment sump pH control system will be moved to a TS applicable to both units. The FENOC evaluation of the proposed changes is enclosed.

FENOC requests approval of the proposed amendments by March 14, 2012. Implementation is planned to occur prior to achieving Mode 4 during startup from BVPS-1 refueling outage 21 in the spring of 2012 (1R21).

A commitment related to implementation of the proposed amendment is described in the Attachment to this letter. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – FENOC Fleet Licensing, at 330-761-6071.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 27, 2011.

Sincerely,

Paul A. Harden

Attachment:
Regulatory Commitment List

Enclosure:
FENOC Evaluation of Proposed Changes

cc: NRC Region I Administrator
NRC Resident Inspector
NRC Project Manager
Director BRP/DEP
Site BRP/DEP Representative

ATTACHMENT
L-11-141

Regulatory Commitment List

The following identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station, Unit No. 1, in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not Regulatory Commitments. Please notify Mr. Thomas A. Lentz, Manager – Fleet Licensing at (330) 761- 6071 of any questions regarding this document or the associated Regulatory Commitment.

Regulatory Commitment	Due Date
Initial loading of NaTB baskets will be performed based on weight. When the baskets are filled, the level of each basket will be noted and documented for reference in evaluating volume.	Subsequent to NRC approval and concurrent with implementation of the license amendment issued in response to License Amendment Request 10-021.

FENOC Evaluation of Proposed Changes

Subject: License Amendment Request 10-021, Replacement of Beaver Valley Power Station Unit No. 1 Spray Additive System by Containment Sump pH Control System. Changes Proposed to Technical Specifications 3.6.8 and 3.6.9.

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Attachments

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Operating Licenses DPR-66 for Beaver Valley Power Station Unit No.1 (BVPS-1) and NPF-73 for Beaver Valley Power Station Unit No. 2 (BVPS-2).

The requested amendment involves changes to the Technical Specifications (TS) that would allow the use of sodium tetraborate (NaTB) to replace sodium hydroxide (NaOH) as a chemical additive for containment sump pH control following a loss-of-coolant accident (LOCA) at BVPS-1. Sodium hydroxide is currently in use at BVPS-1 as required by TS 3.6.8, and NaTB is currently in use at BVPS-2 as required by TS 3.6.9. Technical Specification 3.6.8 would be replaced in its entirety by a new TS 3.6.8 and TS 3.6.9 would be deleted. The new TS 3.6.8 would be common to both units and would include the requirements of current TS 3.6.9 modified to include requirements for BVPS-1. Changes to the BVPS-2 TS are only associated with moving the requirements for pH control from the current TS 3.6.9 to TS 3.6.8. The BVPS-2 amendment, therefore, would be administrative in nature.

This change is being proposed as an enhancement to BVPS-1 because replacement of the liquid NaOH with granular NaTB contained in baskets located in the containment building would eliminate active components of the spray additive system and reduce testing and maintenance. The new system would not have potential for inadvertent discharge and the potential for personnel injury from chemicals would be reduced.

2.0 DETAILED DESCRIPTION

The proposed TS changes and TS Bases changes are provided in Attachments A and B, respectively. The TS Bases changes are provided for information only and do not require Nuclear Regulatory Commission (NRC) approval as permitted by TS 5.5.10, "Technical Specifications (TS) Bases Control Program." Attachments A and B show deletions with a strike-through and insertions underlined, with a vertical line in the margin showing the area of change. A line drawn from the top left to bottom right of page indicates that the page is deleted or modified in its entirety as indicated on the page. This presentation allows the reviewer to readily identify the information that would be deleted or added. To meet format requirements, index, TS and Bases pages would be revised and repaginated as necessary to reflect the changes being proposed by this license amendment request. Retyped TS pages are provided in Attachment C.

The following TS changes are proposed:

- The entire TS 3.6.8 would be replaced. The new TS 3.6.8 would include the current wording of TS 3.6.9 modified to be applicable to both BVPS-1 and BVPS-2. Limiting condition for operation, applicability and actions statements from current TS 3.6.9 would not change. Modifications to the current TS 3.6.9 wording include the following items.

1. Changing the title from “Unit 2 Containment Sump pH Control System” to “Containment Sump pH Control System.”

2. Changing the number specified for TS 3.6.9 and limiting condition for operation 3.6.9 to read 3.6.8.

3. Changing surveillance requirement (SR) numbers 3.6.9.1 and 3.6.9.2 to read 3.6.8.1, and 3.6.8.2 respectively.

4. Changing the current SR 3.6.9.1.b wording to include the minimum contained volume of NaTB for BVPS-1.

- TS 3.6.9 would be deleted.

3.0 TECHNICAL EVALUATION

3.1 Background

In accordance with the current BVPS-1 design basis, the acceptance criterion for sump water pH is a range from 7.0 to 10.5 to provide for continued iodine retention effectiveness and to minimize material corrosion for systems and components exposed to the fluid.

The Pressurized Water Reactor Owners Group (PWROG) investigated the ability to reduce chemical precipitate formation by replacing NaOH with another chemical that is less reactive with the materials in containment. The program tested alternative buffering agents to determine the efficacy of these materials as replacements for NaOH. Based on this testing, NaTB has been selected to replace NaOH at BVPS-1. The results of the PWROG activity were reported in WCAP-16596-NP, “Evaluation of Alternative Emergency Core Cooling System Buffering Agents” (Reference 1).

Liquid NaOH solution is currently used as the buffering agent at BVPS-1 for the post-LOCA recirculation fluid. The NaOH is stored in one spray additive tank which contains a minimum of 4,700 gallons of a NaOH solution with a concentration of 19.5 to 20 percent by weight. Upon receipt of a containment isolation Phase B signal, two redundant spray additive subsystems, one for each train of the Quench Spray System (QSS), deliver the NaOH to the QSS pump suctions. This chemical addition is intended to facilitate the removal of radioactive iodine from the containment atmosphere by achieving a spray pH of between 8.39 and 10.1. The final pH of the containment sump water after a design basis accident, including the contents of the refueling water storage tank (RWST), is approximately 7.8 to 8.79.

Implementation of the requested amendment will require removal of the existing NaOH delivery system equipment from service and plant modifications to accommodate the use of NaTB. The necessary plant modifications described below include installation of baskets in the containment building to hold the NaTB.

Six (6) baskets will be installed on the lowest floor of the containment building. Each NaTB basket will be designed to contain approximately 44 cubic feet of NaTB. All baskets will be submerged by the post-LOCA flood inventory. As this water collects on the lowest containment floor, the borated water dissolves the NaTB. Mixing is achieved as the solution is continuously recirculated by the emergency core cooling system (ECCS) and the recirculation spray system pumps following the recirculation actuation signal. The combined volume of the baskets will contain sufficient NaTB at maximum hydration and minimum density to ensure that the containment sump water pH following a LOCA would be 7 or greater. All of the above described modifications, which are necessary to support license amendment implementation, will be completed in accordance with 10 CFR 50.59 and the FENOC design modification process; therefore, prior NRC approval is not required.

Initial loading of NaTB baskets will be performed based on weight. When the baskets are filled, the level of each basket will be noted and documented for reference in evaluating volume. Subsequent periodic surveillances will verify the NaTB volume in each basket.

The introduction of filled NaTB baskets results in a minor decrease in containment net free volume and an increase in the available heat sinks in the containment. The additional heat sinks and the reduction in net free volume would not increase the containment peak pressure or containment peak temperature calculations for LOCAs. The change does not affect the post-accident containment pressure and temperature profiles used for environmental qualification analyses, as reported in the BVPS-1 UFSAR. The volume of steel added by the baskets was assessed for the effect on maximum containment post-LOCA flood level, and there was no adverse impact.

Elimination of the NaOH spray additive would reduce the post accident containment sump fluid inventory. However, available net positive suction head (NPSH) calculated for the pumps taking suction from the sump (low head safety injection pumps and recirculation spray pumps) would not be affected because the volume of NaOH has an insignificant impact on sump level.

3.2 Sodium Tetraborate Evaluation

NaTB is predicted to result in a reduction in precipitate formation with no adverse side effects as demonstrated by alternate buffer testing documented in WCAP-16596-NP (Reference 1). As part of a PWROG chemical effects resolution effort, Westinghouse has evaluated several compounds as potential replacement buffers that would minimize the potential for chemical precipitate formation following a LOCA. The NaOH spray, reacting with aluminum in the containment, has the potential to produce chemical precipitates such as sodium aluminum silicate ($NaAlSi_3O_8$) and aluminum oxyhydroxide (AlOOH), especially at higher pH values. The Westinghouse study determined that NaTB is a good candidate for replacing NaOH.

Table 1 provides the calculated quantities of chemical precipitates with the current NaOH buffer and the precipitates with the proposed change to NaTB. The quantities were calculated for a reactor coolant system loop cross-over leg break, a reactor vessel nozzle break, and pressurizer code safety valve line break using the spreadsheet model provided in WCAP-16530-NP, “Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191” (Reference 2).

Table 1
Calculated Chemical Precipitate Quantities

BREAK	BUFFER	$NaAlSi_3O_8$ lbs	AlOOH lbs
LOOP	Sodium Hydroxide	110.25	136.84
LOOP	Sodium Tetraborate	103.05	34.24
NOZZLE	Sodium Hydroxide	75.66	170.94
NOZZLE	Sodium Tetraborate	74.29	67.0
PRESSURIZER	Sodium Hydroxide	120.74	151.48
PRESSURIZER	Sodium Tetraborate	104.77	50.89

The values in Table 1 are based on the current BVPS-1 post-LOCA debris load.

As indicated in Table 2 below, the equilibrium sump pH with NaTB was determined for three (3) points in time following a LOCA.

Table 2
pH, Water Volumes, and Boron Concentrations

Event	pH	Source	Volume (liters)	Concentration (ppm)	Concentration (gm-moles/liter)	Vol. x Conc. (gm-moles)
Start of Recirculation* (no acid contribution)	7.54	RWST**	547,797	2600	0.240518	131,755.16
		Accumulators	86,820	2600	0.240518	20,881.78
		RCS***	191,700	2400	0.222017	42,560.59
		BIT****	3,407	2600	0.240518	819.45
End of Quench Spray (no acid contribution)	7.16	RWST	1,654,600	2600	0.240518	397,961.15
		Accumulators	86,820	2600	0.240518	20,881.78
		RCS	191,700	2400	0.222017	42,560.59
		BIT	3,407	2600	0.240518	819.45
End of 30 Days (full acid contribution)	7.00	RWST	1,654,600	2600	0.240518	397,961.15
		Accumulators	86,820	2600	0.240518	20,881.78
		RCS	191,700	2400	0.222017	42,560.59
		BIT	3,407	2600	0.240518	819.45

* Mass of water in the reactor vessel included in pH analysis
** Refueling Water Storage Tank
*** Reactor Coolant System
**** Boron Injection Tank

The raw titration data sets for NaTB/boric acid systems and NaOH/boric acid systems presented in WCAP-16596-NP (Reference 1) were analyzed, and a correlation relating total boron concentration to free base was developed for solution pH levels. As the specification for NaTB indicated that the NaTB equivalence had a range of 99.9 to 105 percent, it was conservatively assumed that the NaTB/boric acid titrations were performed with 105 percent NaTB while the mass of NaTB required to maintain the sump pH greater than or equal to 7.0 was calculated under the assumption that the NaTB equivalence was 99.9 percent.

In determining the mass (and volume) of NaTB required to be stored in the baskets, the maximum borated water source volumes and concentrations provided in Table 2 were used as well as the 30-day acid production plus margin. The conservatively calculated minimum NaTB weight was approximately 9,002 pounds (with a corresponding volume of 188 cubic feet at a minimum density of 48 pounds per cubic foot) to maintain the minimum pH greater than or equal to 7.0.

Also of concern was the maximum long-term pH if the minimum borated water source volumes and concentrations and maximum effective NaTB (105 percent) were used. Table 3 below provides the minimum volume and concentration of borated sources.

Table 3
Minimum Volume and Concentration of Borated Sources

Source	Volume (liters)	Concentration (ppm)
RWST	1,629,600	2,400
Accumulators	75,870	2,300
RCS	191,700	0
BIT	3,407	0

The ability of NaTB to rapidly dissolve and achieve pH levels greater than or equal to 7.0 in time to avoid iodine re-evolution due to hydrogen peroxide formation from radiolysis, was evaluated in WCAP-16596-NP (Reference 1). The dissolution times of NaTB were compared to tri-sodium phosphate (TSP), which has already been approved for use in this application at other facilities. It was found that NaTB has a dissolving rate per gram that is higher than TSP and that NaTB is more effective per gram than TSP in raising solution pH in boric acid solutions (at pH levels less than 7.5).

Assuming that all the NaTB (105 percent) is dissolved at the start of ECCS recirculation and the baskets are filled to capacity with full densification (65 pounds per cubic foot), the maximum pH for the minimum borated source case is 8.28 with no acid addition.

Acid production has been considered in the pH calculations. The strong acids of concern are hydrochloric acid resulting from cable degradation in high radiation fields, and nitric acid generated due to radiolysis of the containment air and sump water, as described in NUREG/CR-5950, "Iodine Evolution and pH Control" (Reference 3). The maximum quantity of these acids generated during the 30-day duration post-LOCA was calculated to be 4916.9 gm-moles. This quantity was based on the 30-day integrated beta and gamma dose values from a LOCA with conservative volumes of cable insulation and sump water. A time-dependant analysis at other times was not performed. A conservative 10 percent margin on the acid production was utilized in the analysis. The calculated minimum sump water pH and the associated required mass of NaTB decahydrate incorporate the 30-day acid production. The calculated minimum pH at initiation of the recirculation mode assumes no acid production prior to that point in time.

The proposed change would replace the addition of liquid NaOH in the spray with granular NaTB stored in baskets on the lowest floor of the containment building. As a result of this change, the BVPS-1 quench spray would consist only of a boric acid solution from the RWST with a spray pH as low as 4.6. As indicated in Standard Review Plan (SRP), Section 6.5.2, “Containment Spray As A Fission Product Cleanup System,” fresh sprays (sprays with no dissolved iodine) are effective at scrubbing elemental iodine and thus a spray additive is unnecessary during the initial injection phase when the spray solution is being drawn from the RWST. As described in the SRP, elemental iodine can be scrubbed from the atmosphere with water at a low pH.

Since long-term use of a plain boric acid spray could increase the potential for elemental iodine re-evolution during the recirculation phase of the LOCA, the equilibrium sump solution pH must be increased.

The current licensing basis for BVPS-1 credits the Alternative Source Term (AST) with guidance from Regulatory Guide 1.183, “Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors” (Reference 4), for evaluating the radiological consequences of a LOCA. The Regulatory Guide 1.183 guidance indicates that if the sump water pH is 7 or greater, then a licensee does not need to evaluate re-evolution of iodines for dose consequences. In accordance with the current licensing basis, the dose analysis need not address iodine re-evolution, since a long-term sump water pH of 7 or greater is achieved. The definition of long term as it relates to sump pH and iodine re-evolution post LOCA is based on NUREG/CR 5732, “Iodine Chemical Forms in LWR Severe Accidents – Final Report” (Reference 5). The NaTB modification conforms to these aspects of the current licensing basis.

The change in the buffering agent from NaOH to NaTB results in an impact on the long term containment sump water pH. However, since the NaTB baskets are sized to ensure a long term sump water pH of 7 or greater, there is no impact on the current post-LOCA containment and ECCS leakage dose consequence models relative to iodine re-evolution. The only leakage pathway that is potentially impacted by the change in the sump pH is the RWST back-leakage pathway. This leakage pathway was evaluated for the proposed buffer change. The calculated integrated iodine release for this pathway is bounded by the current analysis and therefore the current LOCA dose consequence analysis of record for BVPS-1 remains valid for the NaTB modification.

The Environmental Qualification (EQ) program for BVPS-1 meets the requirements of 10 CFR 50.49, “Environmental Qualification of Electrical Equipment Important to Safety For Nuclear power Plants.” Equipment within the scope of this program has been evaluated for compliance with NRC IE Bulletin No. 79-01B, “Environmental Qualification of Class 1E Equipment” (Reference 6), and 10 CFR 50.49.

The current spray additive system design renders the quench spray solution alkaline while NaOH is injected into the boric acid solution from the RWST at the quench spray pump suctions. Equipment in the EQ program is qualified for a chemical spray with a pH range of 7.0 to 10.5. In the new design, the spray solution during the injection mode would be acidic, consisting of spray solution from the RWST only. Components in the containment subject to the EQ program have been identified and evaluated for the effects of quench spray with a pH of 4.6 and an alkaline spray during the long term recirculation mode. The evaluation considered the chemical resistance of organic materials, the corrosive effects of metallic materials exposed to the spray, and the duration of the initial acidic spray followed by the longer term alkaline spray. The method used for the EQ evaluations relied on the original EQ test that bounded the pH range of the modified quench spray, when this information was available. If component tests were not bounding, the evaluations were performed against industry information on the resistance of materials to chemicals. The physical installation was evaluated to determine what parts of the component would be subjected to the direct spray. Credit is taken for junction boxes, conduit, and seals. The evaluations concluded that environmentally qualified equipment located in the containment is qualified for the revised quench and recirculating sprays without the need for additional protection from spray.

Branch Technical Position 6-1, “pH for Emergency Coolant Water for Pressurized Water Reactors” (Reference 7), states that consideration should be given to hydrogen generation if a pH greater than 7.5 is used. Use of NaTB at BVPS-1 would result in a lower pH than for NaOH. Therefore, the post-LOCA hydrogen generation rate would not be increased.

In conclusion, the proposed replacement of NaOH with NaTB has less potential for undesirable chemical effects, while maintaining an acceptable long-term sump pH range to minimize radioactivity releases and corrosion of containment materials. The proposed change would not have adverse effects on the radiological analysis, hydrogen generation, or the functional capability of reactor containment systems, structures, and components following a postulated LOCA.

3.3 Technical Specification Changes

The proposed TS changes presented in Attachment A are needed to support the replacement of NaOH with NaTB as a chemical additive for post-LOCA containment sump pH control at BVPS-1.

The proposed TS changes would allow NaTB to replace NaOH and would accomplish the same purpose as existing TS 3.6.8 with respect to ensuring iodine retention effectiveness of the sump water during the recirculation phase of spray operation and minimizing the occurrence of chloride induced stress corrosion cracking of the stainless steel recirculation piping. Both additives maintain pH control to ensure iodine retention and to minimize stress corrosion cracking in stainless steel. However, the use of NaOH has been shown to exacerbate post-LOCA sump screen blockage due to a potential adverse chemical interaction with certain insulation materials used in containment. Therefore, to reduce the potential for such an interaction, FENOC is proposing to replace the NaOH with NaTB which has essentially the same buffering agent characteristics but with less potential adverse consequences. A fully hydrated (decahydrate) form of NaTB would normally be used for initial filling and makeup to the baskets. This form is less likely to absorb large amounts of water under humid conditions. If exposed to dry containment conditions, there is a potential for some loss of water. The chemical properties of the buffer do not change as the result of water loss, but weight does decrease.

Proposed TS 3.6.8 is titled "Containment Sump pH Control System," to reflect the new method of pH control for BVPS-1 and the ongoing method of pH control for BVPS-2. The NaOH is a spray additive, but the NaTB would be dissolved in the post-LOCA fluid collected in the containment. The Limiting Conditions for Operation and Actions for NaOH and NaTB are equivalent. New SRs 3.6.8.1 and 3.6.8.2 have the same intent as current SRs 3.6.8.1 through 3.6.8.6, but reflect the modified design. New SRs 3.6.8.1 and 3.6.8.2 are sufficient to ensure integrity and functionality of the passive delivery devices (the baskets) and to ensure that a sufficient quantity of NaTB would be delivered, if required. New SRs 3.6.8.1 and 3.6.8.2 are required to be performed less frequently during operation than the SRs for NaOH because of the passive nature of the system. In addition, inaccessibility of the baskets while the plant is operating ensures that operability status would not change during the surveillance period (that is, between refueling outages).

New SR 3.6.8.1.b requirements for the quantity of NaTB are based on an analysis that determined the amount of NaTB needed to maintain long term post-LOCA containment sump pH at 7 or greater. The analysis considered the minimum and maximum quantities of boron and borated water. In addition, the formation of acid from radiolysis of air and water, radiolysis of chloride bearing electrical cable insulation and jacketing, and spilled reactor core inventory were included. The quantity of 188 cubic feet of NaTB reflected in proposed SR 3.6.8.1.b is the amount needed to maintain sump water pH at 7 or greater for 30 days assuming minimum NaTB density (48 pounds/cubic foot) and maximum hydration.

Since the fully hydrated (decahydrate) form of NaTB would normally be used when filling or making up to the baskets, it would not adsorb additional waters of hydration during storage in areas of elevated humidity. However the NaTB decahydrate has the potential to become more dense, occupying less volume than when initially installed. Densification would not affect predicted pH levels, however, a loss of volume identified during surveillances would require addition of NaTB and would increase the overall quantity of NaTB beyond the amount originally installed. The maximum pH that could be achieved would result if the baskets were filled to capacity at maximum NaTB densification. The analysis of this condition resulted in a maximum pH of 8.28 at the start of recirculation. This maximum pH value is bounded by the maximum evaluated pH of 10.1 for NaOH. Therefore, the effects of high pH sump water on equipment qualification and hydrogen generation remain bounded. Since the condition of the baskets being filled to capacity results in an acceptable sump water pH value, no requirements are specified for a NaTB maximum quantity.

Moving the BVPS-2 requirements of TS 3.6.9 to a common TS 3.6.8, applicable to both BVPS-1 and BVPS-2, is administrative in nature and has no technical or safety impact on the existing BVPS-2 TS requirements or system operability.

4.0 REGULATORY EVALUATION

FirstEnergy Nuclear Operating Company proposes to revise Technical Specification (TS) 3.6.8, "Unit 1 Spray Additive System" to require use of sodium tetraborate (NaTB) in lieu of sodium hydroxide (NaOH) as a containment spray system additive at Beaver Valley Power Station Unit No. 1 (BVPS-1). The revised TS 3.6.8 entitled, "Containment Sump pH Control System," would also include the existing BVPS-2 requirements from TS 3.6.9 making the revised TS 3.6.8 applicable to both units. TS 3.6.9 would be deleted.

Use of NaTB at BVPS-1 is preferable because reactions between NaOH and certain materials in containment may produce undesirable chemical effects that could limit flow through containment sump strainers, thereby reducing available suction head for the low head safety injection pumps and recirculation spray pumps supplied by the strainers. The new TS 3.6.8 would achieve the same overall purpose as the requirements removed from existing TS 3.6.8, but would reflect the specific characteristics of the system using NaTB rather than NaOH.

4.1 No Significant Hazards Consideration Analysis

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

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

   Response: No.

   Use of NaTB in lieu of NaOH would not involve a significant increase in probability of a previously evaluated accident because the containment spray additive is not an initiator of any analyzed accident. The NaTB would be stored and delivered by a passive method that does not have potential to affect plant operations. Any existing NaOH delivery system equipment that remains in place but is removed from service would meet existing seismic and electrical requirements. Therefore the change in additive, including removal of NaOH equipment from service, would not result in any failure modes that could initiate an accident.

The spray additive is used to mitigate the long-term consequences of a LOCA. Use of NaTB as an additive in lieu of NaOH would not involve a significant increase in the consequences of a previously evaluated accident because the amount of NaTB specified in the proposed TS would achieve a sump pH of 7 or greater, consistent with the current licensing basis. This pH is sufficient to achieve long-term retention of iodine by the containment sump fluid for the purpose of reducing accident related radiation dose following a LOCA.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No.

   Regarding the proposed use of NaTB in lieu of NaOH, the NaTB would be stored and delivered by a passive method that does not have potential to affect plant operations. Any existing NaOH delivery system equipment that is removed from service would meet existing seismic and electrical requirements. Hydrogen generation would not be significantly impacted by the change. Therefore, no new failure mechanisms, malfunctions, or accident initiators would be introduced by the proposed change, and it would not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No.

   Since the quantity of NaTB specified in the amended TS would reduce the potential for undesirable chemical effects while achieving radiation dose reductions, corrosion control and hydrogen generation effects that are comparable to NaOH, the proposed change does not involve a significant reduction in a margin of safety. The primary function of an additive is to reduce long-term loss-of-coolant accident consequences by controlling the amount of iodine fission products released to containment atmosphere from reactor coolant accumulating in the sump during a LOCA. Because the amended technical specifications would achieve a sump pH of 7 or greater using NaTB, dose related safety margins would not be significantly reduced. Use of NaTB reduces the potential for undesirable chemical effects that could interfere with recirculation flow through the sump strainers. Any existing NaOH delivery system equipment that remains in place but is removed from service would meet existing seismic and electrical requirements and would not interfere with operation of the existing containment or containment spray system.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, FirstEnergy Nuclear Operating Company concludes that the proposed amendments do not involve a 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.

4.2 Applicable Regulatory Requirements/Criteria

Changes described in the license amendment request comply with the following aspects of the regulations and regulatory guides.

10 CFR Part 50.44, "Combustible Gas Control for Nuclear Power Reactors" relates to the requirement for PWR plants to have the capability for ensuring a mixed atmosphere so that the concentration of combustible gasses in containment is below a level that would support combustion or detonation that could cause loss of containment integrity.

10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," requires qualification of electrical equipment with respect to environmental conditions at the location where the equipment must perform its safety function.

10 CFR 50.67, "Accident Source Term" and Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," provide criteria for evaluating the consequences of applicable design basis accidents. Regulatory Guide 1.183 indicates that analyses should consider iodine re-evolution if the sump liquid pH is not maintained at 7 or greater.

10 CFR 50, Appendix A, General Design Criterion (GDC) 38, "Containment Heat Removal" and Standard Review Plan (SRP) Section 6.2.2, "Containment Heat Removal Systems," relate to the capability of the containment system to accomplish its safety function. The SRP indicates that the spray system should be designed to accomplish this without pump cavitation occurring. A supporting analysis should be presented in sufficient detail to permit the staff to determine the adequacy of the analysis and should show that the available NPSH is greater than the required NPSH.

GDC 41, "Containment Atmosphere Cleanup," requires systems to control fission products, hydrogen, oxygen, and other substances that may be released into the reactor containment to reduce, consistent with the functioning of other associated systems, the concentration and quality of fission products released to the environment following postulated accidents, and to control the concentration of hydrogen or oxygen and other substances in the containment atmosphere following postulated accidents to assure that containment integrity is maintained.

GDC 42, "Inspection of Containment Atmosphere Cleanup Systems," requires the containment atmosphere cleanup systems to be designed to permit appropriate periodic inspection of important components, such as filter frames, ducts, and piping to assure the integrity and capability of the systems.

GDC 43, "Testing of Containment Atmosphere Cleanup Systems" requires the containment atmosphere cleanup systems to be designed to permit appropriate periodic pressure and functional testing to assure (1) the structural and leaktight integrity of its components, (2) the operability and performance of the active components of the systems such as fans, filters, dampers, pumps, and valves and (3) the operability of the systems as a whole and, under conditions as close to design as practical, the performance of the full operational sequence that brings the systems into operation, including operation of applicable portions of the protection system, the transfer between normal and emergency power sources, and the operation of associated systems.

4.3 Precedent

A license amendment request to replace NaOH with NaTB at BVPS-2 was submitted to the NRC in an application dated September 24, 2008 (Accession No. ML082730716), and supplemented by a letter dated November 10, 2008 (Accession No. ML083180133). The NRC subsequently granted Amendment No. 168 to the BVPS-2 facility operating license by letter dated April 16, 2009 (Accession No. ML090780352).

4.4 Conclusions

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 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.

5.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, 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 effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 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.

6.0 REFERENCES

1. WCAP-16596-NP, Revision 0, "Evaluation of Alternative Emergency Core Cooling System Buffering Agents," dated July 2006

2. WCAP-16530-NP, Revision 0, “Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191,” dated February 2006

3. NUREG/CR-5950, “Iodine Evolution and pH Control,” dated December 1992

4. Regulatory Guide 1.183, “Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors,” dated July 2000

5. NUREG/CR 5732, “Iodine Chemical Forms in LWR Severe Accidents – Final Report,” dated April 1992

6. NRC IE Bulletin No. 79-01B, “Environmental Qualification of Class 1E Equipment,” dated January 14, 1980

7. Branch Technical Position 6-1, “pH for Emergency Coolant Water for Pressurized Water Reactors,” dated March 2007

Attachment A

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Changes

License Amendment Request No. 10-021

The following is a list of the affected pages.

3.6.8 - 1
3.6.8 - 2
3.6.9 - 1

This Page to be Replaced With Page 3.6.9-1 Mark-up

3.6 CONTAINMENT SYSTEMS

3.6.8 Unit 1 Spray Additive System

LCO 3.6.8 The Spray Additive System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spray Additive System inoperable.	A.1 Restore Spray Additive System to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.1	Verify each spray additive 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.	31 days
SR 3.6.8.2	Verify spray additive tank solution volume is ≥ 4700 gallons.	184 days
SR 3.6.8.3	Verify spray additive tank NaOH solution concentration is ≥ 19.5% and ≤ 20% by weight.	184 days
SR 3.6.8.4	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.8.5	Verify that each chemical injection pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.6.8.6	Verify on recirculation flow that each chemical injection pump develops the required flow rate.	In accordance with the Inservice Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.~~9~~8 ~~Unit 2~~ Containment Sump pH Control System

LCO 3.6.~~9~~8 The Containment Sump pH Control System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Containment Sump pH Control System inoperable.	A.1	Restore Containment Sump pH Control System to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.~~9~~8.1	Perform a visual inspection of the six sodium tetraborate storage baskets to verify the following: a. Each storage basket is in place and intact; and, ~~b. Collectively contain ≥ 292 cubic feet of sodium tetraborate.~~ b. Collectively contain ≥ 188 cubic feet of sodium tetraborate (Unit 1) ≥ 292 cubic feet of sodium tetraborate (Unit 2).	18 months
SR 3.6.~~9~~8.2	Verify that a sample from the sodium tetraborate baskets provides adequate pH adjustment of containment sump borated water.	18 months

Attachment B

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Bases Changes

License Amendment Request No. 10-021

The following is a list of the affected pages.

B 3.6.8 - 1	B 3.6.9 - 1*
B 3.6.8 - 2	B 3.6.9 - 2*
B 3.6.8 - 3	B 3.6.9 - 3*
B 3.6.8 - 4	B 3.6.9 - 4*
B 3.6.8 - 5*	

* Entire page deleted.

Replace Bases Section B 3.6.8, Revision 12
Pages B 3.6.8-1 through B 3.6.8-4

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8 Unit 1 Spray Additive System

BASES

BACKGROUND

The Spray Additive System (commonly referred to as the Chemical Addition System) is a subsystem of the Quench Spray (QS) System that assists in reducing the iodine fission product inventory in the containment atmosphere resulting from a Design Basis Accident (DBA).

Radioiodine in its various forms is the fission product of primary concern in the evaluation of a DBA. It is absorbed by the spray from the containment atmosphere. To enhance the iodine absorption capacity of the spray, the spray solution is adjusted to an alkaline pH by the addition of sodium hydroxide (NaOH). This alkaline pH promotes iodine hydrolysis, in which iodine is converted to nonvolatile forms.

The addition of the NaOH solution from the spray additive tank occurs when the Spray Additive System is initiated by a containment isolation phase B signal. Two redundant spray additive subsystems, one for each train of the QS System, supply the NaOH solution to the suction of the QS pumps. Each subsystem contains two 50% capacity positive displacement pumps and associated flow path valves. The two spray additive subsystems are electrically redundant and independent. Two subsystems are required OPERABLE to ensure the safety function can be performed in the event a single active failure disables one subsystem or one train of the QS System. During the time the spray additive tank is being injected into the QS System, the resulting quench spray has a pH of 8.5 to 10.4. The final pH of the containment sump water after a DBA, including the contents of the refueling water storage tank (RWST), is approximately 7.9 to 8.9.

The operation of the Spray Additive System enhances the iodine absorption capacity of the Quench Spray System and ensures the continued iodine retention effectiveness of the sump water during the recirculation phase of spray operation and also minimizes the occurrence of chloride induced stress corrosion cracking of the stainless steel recirculation piping.

Replace Bases Section B 3.6.8, Revision 12
Pages B 3.6.8-1 through B 3.6.8-4

BASES

APPLICABLE SAFETY ANALYSES

The Spray Additive System is essential to the removal of airborne iodine within containment following a DBA.

Following the assumed release of radioactive materials into containment, the containment is assumed to leak at its design value for the first 24 hours following the accident and at half the design value for the next 29 days. The analysis assumes that 63% of containment is covered by the spray (Ref. 1).

The DBA response time assumed for the Spray Additive System is the same as for the Quench Spray System and is discussed in the Bases for LCO 3.6.6, "Quench Spray System."

The DBA analyses assume that one train of the Quench Spray System/Spray Additive System is inoperable and that sufficient NaOH solution is added to achieve the required pH values.

The Spray Additive System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The Spray Additive System is necessary to reduce the release of radioactive material to the environment in the event of a DBA. To be considered OPERABLE, the volume and concentration of the spray additive solution must be sufficient to raise the spray and containment sump pH to the required values. Achieving the required pH values maximizes the effectiveness of the iodine removal mechanism without introducing conditions that may induce caustic stress corrosion cracking of mechanical system components. In order to ensure sufficient NaOH is added, each Spray Additive System injection pump must be able to start automatically when required and be capable of delivering the required flow. In addition, it is essential that valves in the Spray Additive System flow paths are properly positioned and that automatic valves are capable of activating to their correct positions.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment requiring the operation of the Spray Additive System. The Spray Additive System assists in reducing the iodine fission product inventory prior to release to the environment.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Thus, the Spray Additive System is not required to be OPERABLE in MODE 5 or 6.

Provided for Information Only

Replace Bases Section B 3.6.8, Revision 12
Pages B 3.6.8-1 through B 3.6.8-4

ACTIONS

A.1

If the Spray Additive System is inoperable, it must be restored to OPERABLE within 72 hours. The pH adjustment of the Containment Spray System flow for corrosion protection and iodine removal enhancement is reduced in this condition. The Containment Spray System would still be available and would remove some iodine from the containment atmosphere in the event of a DBA. The 72 hour Completion Time takes into account the redundant flow path capabilities and the low probability of the worst case DBA occurring during this period.

B.1 and B.2

If the Spray Additive System cannot be restored to OPERABLE status within the required 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 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows 48 hours for restoration of the Spray Additive System in MODE 3 and 36 hours to reach MODE 5. This is reasonable when considering the reduced pressure and temperature conditions in MODE 3 for the release of radioactive material from the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

SR 3.6.8.1

Verifying the correct alignment of Spray Additive System manual, power operated, and automatic valves in the spray additive flow path provides assurance that the system is able to provide additive to the Containment Spray System in the event of a DBA. 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. This SR does not require any testing or valve manipulation. Rather, it involves verification that those valves outside containment and capable of potentially being mispositioned are in the correct position.

Provided for Information Only

Replace Bases Section B 3.6.8, Revision 12
Pages B 3.6.8-1 through B 3.6.8-4

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.2

To provide effective iodine removal, the containment spray must be an alkaline solution. Since the RWST contents are normally acidic, the contained volume of the spray additive tank must provide a sufficient volume of spray additive to adjust pH for all water injected. This SR is performed to verify the availability of sufficient NaOH solution in the Spray Additive System. The 184 day Frequency was developed based on the low probability of an undetected change in tank volume occurring during the SR interval (the tank is isolated during normal unit operations). Tank level is also indicated and alarmed in the control room, so that there is high confidence that a substantial change in level would be detected.

SR 3.6.8.3

This SR provides verification of the NaOH concentration in the spray additive tank and is sufficient to ensure that the spray solution being injected into containment is at the correct pH level. The NaOH concentration is verified by chemical analysis. The 184 day Frequency is sufficient to ensure that the concentration level of NaOH in the spray additive tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.

SR 3.6.8.4

This SR provides verification that each automatic valve in the Spray Additive System flow path actuates to its correct position. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. However, this does not preclude performance of this Surveillance at power when it can be accomplished in a safe manner. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Provided for Information Only

Delete entire Bases Page B 3.6.8-5, Revision 12

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.5

This SR ensures that each required spray additive pump starts upon receipt of an actual or simulated containment phase B isolation signal. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage. However, this does not preclude performance of this Surveillance at power when it can be accomplished in a safe manner. Operating experience has shown that these components usually pass the Surveillances when performed at an 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.8.6

To ensure that the correct pH level is established in the borated water solution provided by the Quench Spray System, the recirculation flow rate of each Spray Additive System injection pump is verified in accordance with the Inservice Testing Program. The required pump recirculation flow rate is ≥ 25 gpm and ≤ 35 gpm. This SR provides assurance that the correct amount of NaOH will be metered into the flow path upon Quench Spray System initiation. The inservice testing confirms component OPERABILITY, trends performance, and detects incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

REFERENCES

1. UFSAR, Chapter 14 (Unit 1).

B 3.6 CONTAINMENT SYSTEMS

B 3.6.89 Unit 2 Containment Sump pH Control System

BASES

BACKGROUND

The Containment Sump pH Control System is a passive system consisting of six baskets of sodium tetraborate (NaTB) that assist in reducing the iodine fission product inventory in the containment atmosphere resulting from a Design Basis Accident (DBA).

Radioiodine in its various forms is the fission product of primary concern in the evaluation of a DBA. It is absorbed by the spray from the containment atmosphere. To enhance the iodine absorption capacity of the spray during recirculation from the sump, the spray solution is adjusted to an alkaline pH that promotes iodine hydrolysis, in which iodine is converted to nonvolatile forms.

The NaTB is stored in baskets in the containment. The initial quench spray is acidic since it is a boric acid solution from the Refueling Water Storage Tank (RWST). As the initial spray solution, and subsequently the recirculation solution, comes in contact with the NaTB, the NaTB dissolves, raising the pH of the sump solution. The final pH of the containment sump water after a DBA is alkaline. An alkaline pHControl of the containment sump water pH minimizes the evolution of iodine as well as the occurrence of chloride and caustic stress corrosion on mechanical systems and components exposed to the fluid.

Provided for Information Only

BASES

APPLICABLE SAFETY ANALYSES

The Containment Sump pH Control System is essential to the removal of airborne iodine within containment following a DBA.

Quench spray consists of a boric acid solution with a spray pH as low as 4.6. As indicated in Standard Review Plan (SRP), Section 6.5.2, Rev 2, "Containment Spray as A Fission Product Cleanup System," fresh sprays (i.e., sprays with no dissolved iodine) are effective at scrubbing elemental iodine and thus a spray additive is unnecessary during the initial injection phase when the spray solution is being drawn from the RWST. As described in the SRP, research has shown that elemental iodine can be scrubbed from the atmosphere with borated water, even at low pH.

Since long-term use of a plain boric acid spray could increase the potential for elemental iodine re-evolution during the recirculation phase of the LOCA, the equilibrium sump solution pH is increased by adding NaTB. Regulatory Guide 1.183 guidance indicates that if the sump water pH is 7 or greater, then a licensee does not need to evaluate re-evolution of iodines for dose consequences. In accordance with the current licensing basis, the dose analysis need not address iodine re-evolution if the sump water pH of 7 or greater is achieved well within 16 hours after the LOCA and is maintained for the duration of the accident. The Containment Sump pH Control System provides a passive safeguard with six baskets of NaTB located in the containment. The basket contents dissolve as the sump fills, raising pH to the required value and maintaining it at or above that value throughout the accident.

The Unit 2 Containment Sump pH Control System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The Containment Sump pH Control System is necessary to reduce the release of radioactive material to the environment in the event of a DBA. To be considered OPERABLE, the six sodium tetraborate storage baskets must be in place and intact (i.e., having no relevant component removed, destroyed or damaged such that the basket cannot perform its function), collectively contain ≥ 188 cubic feet of sodium tetraborate (Unit 1) and ≥ 292 cubic feet of sodium tetraborate (Unit 2) and be capable of providing the required pH adjustment.

Provided for Information Only

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment requiring the operation of the Containment Sump pH Control System. The Containment Sump pH Control System assists in reducing the iodine fission product inventory prior to release to the environment.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Thus, the Containment Sump pH Control System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

If the Containment Sump pH Control System is inoperable, it must be restored to OPERABLE within 72 hours. The pH adjustment of the recirculation spray solution for corrosion protection and iodine removal is reduced in this condition. The 72 hour Completion Time takes into account that the condition which caused the inoperable system would most likely allow this passive system to continue to provide some capability for pH adjustment and iodine removal, the Containment Spray System would still be available and would remove some iodine from the containment atmosphere in the event of a DBA, and the low probability of the worst case DBA occurring during this period.

B.1 and B.2

If the Containment Sump pH Control System cannot be restored to OPERABLE status within the required 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 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows 48 hours for restoration of the Containment Sump pH Control System in MODE 3 and 36 hours to reach MODE 5. This is reasonable when considering the reduced pressure and temperature conditions in MODE 3 for the release of radioactive material from the Reactor Coolant System.

Provided for Information Only

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.89.1

This SR provides visual verification that the six sodium tetraborate storage baskets are in place and intact and collectively contain ≥ 188 cubic feet of sodium tetraborate (Unit 1) and ≥ 292 cubic feet of sodium tetraborate (Unit 2). This amount of NaTB is sufficient to ensure that the recirculation solution following a LOCA is at the correct pH level. No upper limit for quantity of NaTB is specified because pH values calculated assuming the baskets are filled to capacity demonstrated acceptable pH values. The 18 months frequency is sufficient to ensure that this passive system is intact and contains the required amount of sodium tetraborate.

SR 3.6.89.2

This SR verifies via sampling that the sodium tetraborate contained in the NaTB storage baskets provides adequate adjustment of containment sump borated water. The 18 months frequency is sufficient to ensure the required buffering ability of the sodium tetraborate after exposure to the containment environment.

REFERENCES

1. UFSAR, Chapter 14 (Unit 1).
2. UFSAR, Chapter 15 (Unit 2).

Attachment C

Beaver Valley Power Station, Unit Nos. 1 and 2
Retyped Technical Specification Page

License Amendment Request No. 10-021

The following is a list of the affected pages.

3.6.8 - 1
3.6.8 - 2*
3.6.9 - 1*

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3.6 CONTAINMENT SYSTEMS

3.6.8 Containment Sump pH Control System

LCO 3.6.8 The Containment Sump pH Control System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment Sump pH Control System inoperable.	A.1 Restore Containment Sump pH Control System to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.1	Perform a visual inspection of the six sodium tetraborate storage baskets to verify the following: a. Each storage basket is in place and intact; and, b. Collectively contain $\geq$ 188 cubic feet of sodium tetraborate (Unit 1) $\geq$ 292 cubic feet of sodium tetraborate (Unit 2).	18 months
SR 3.6.8.2	Verify that a sample from the sodium tetraborate baskets provides adequate pH adjustment of containment sump borated water.	18 months