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Docket Number 50-346

License Number NPF-3

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United States Nuclear Regulatory Commission
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Subject: Supplemental Information Regarding License Amendment Application to Modify Technical Specification 3/4.5.2, Emergency Core Cooling Systems - ECCS Subsystems - $T_{avg} \geq 280$ °F
(License Amendment Request No. 03-0004; TAC No. MC0366)

Ladies and Gentlemen:

On August 11, 2003, the FirstEnergy Nuclear Operating Company (FENOC) submitted an application for an amendment to the Davis-Besse Nuclear Power Station (DBNPS), Unit Number 1, Operating License Number NPF-3, Appendix A Technical Specifications, regarding a proposed modification to Technical Specification (TS) 3/4.5.2, "Emergency Core Cooling Systems - ECCS Subsystems - $T_{avg} \geq 280$ °F." This TS Section includes Surveillance Requirement (SR) 4.5.2.f, which requires each ECCS Subsystem to be demonstrated operable by performing a vacuum leakage rate test of the watertight enclosure for Decay Heat Removal System valves DH-11 and DH-12 that assures the electric motor operators on valves DH-11 and DH-12 will not be flooded for at least seven (7) days following a Loss-of-Coolant Accident (LOCA). The proposed amendment (DBNPS letter Serial Number 2834) would allow the relocation of SR 4.5.2.f to the DBNPS Updated Safety Analysis Report (USAR) Technical Requirements Manual (TRM).

By letter dated October 28, 2003, FENOC received a request for additional information (DBNPS letter Log Number 6134) regarding the license amendment application. Enclosure 1 provides the response to this request. FENOC believes that this supplemental information does not affect the conclusion of the license amendment application that the proposed changes do not involve a significant hazards consideration and do not have an adverse effect on nuclear safety.

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Should you have any questions or require additional information, please contact Mr. Kevin L. Ostrowski, Manager - Regulatory Affairs, at (419) 321-8450.

I declare under penalty of perjury that I am authorized by the FirstEnergy Nuclear Operating Company to make this request and that the statements contained in this submittal, including its associated enclosures and attachments, are true and correct to the best of my knowledge and belief.

Executed on: 1/9/04

By: _____
Mark B. Bezilla, Vice President - Nuclear

MKL

Enclosures

cc: Regional Administrator, NRC Region III
J. B. Hopkins, NRC/NRR Senior Project Manager
D. J. Shipley, Executive Director, Ohio Emergency Management Agency, State of Ohio (NRC Liaison)
C. S. Thomas, NRC Region III, DB-1 Senior Resident Inspector
Utility Radiological Safety Board

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

REGARDING

LICENSE AMENDMENT REQUEST (LAR) 03-0004

FOR

DAVIS-BESSE NUCLEAR POWER STATION
UNIT NUMBER 1

Question 1:

The proposed technical specification (TS) change would relocate Surveillance Requirement (SR) 4.5.2.f to the Updated Safety Analysis Report (USAR) Technical Requirements Manual (TRM). However, the submittal does not address the requirement of 10 CFR 50.36(c)(3) to provide a reason why it is acceptable to remove this SR from the TSs. SRs are in place to verify and/or demonstrate that the associated limiting conditions for operation (LCOs) are being met. Please provide the basis for why the SR is not required to demonstrate that the associated LCO is being met.

DBNPS Response to Question 1:

Regulatory requirements related to the content of Technical Specifications are set forth in 10 CFR 50.36, "Technical Specifications." 10 CFR 50.36 requires that Technical Specifications include items in five specific categories: 1) safety limits, limiting safety system settings and limiting control settings; 2) limiting conditions for operation; 3) surveillance requirements; 4) design features; and 5) administrative controls. However, this regulation does not specify the particular Technical Specifications to be included in a plant's license.

10 CFR 50.36(c)(3), "Surveillance Requirements," states:

> Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

The proposed amendment would relocate Surveillance Requirement (SR) 4.5.2.f from Technical Specification (TS) 3/4.5.2, Emergency Core Cooling Systems (ECCS) - ECCS Subsystems - $T_{avg} \geq 280$ °F, to the DBNPS Updated Safety Analysis Report (USAR) Technical Requirements Manual (TRM). This SR assists in providing assurance that following initial ECCS operation, the pathway for at least one boric acid precipitation control (BPC) method will be available to

prevent boric acid concentration build-up and boric acid precipitation in the reactor vessel post-LOCA.

Surveillance Requirement 4.5.2.f is a non-standard, plant-specific requirement that was added to the existing TS 3/4.5.2 at the time the Operating License was issued in 1977. A specific LCO for BPC methods was not added at that time. In addition, there is no LCO for BPC methods in the improved Standard Technical Specifications for Babcock and Wilcox-type plants (NUREG-1430).

The removal of the detail for performing this SR from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. Also, this change is acceptable because the detail in this SR is being relocated to the USAR TRM and will, therefore, continue to be adequately controlled. Any changes to the USAR TRM are made under the requirements of 10 CFR 50.59, which ensures changes are properly evaluated. It is concluded that there is no adverse effect on plant safety as a result of this relocation.

In summary, the proposed relocation of SR 4.5.2.f from the TS to the TRM is acceptable because surveillance testing will continue to be performed and therefore the necessary quality of systems and components will be maintained. In addition, the ability of the facility to operate within safety limits will not be affected by the proposed relocation. Upon relocation of SR 4.5.2.f to the USAR TRM, in the event that the TRM surveillance requirement is not met, the TRM will require compliance with the applicable TS actions, i.e., appropriate actions will be taken in accordance with the TS Limiting Conditions for Operation. Thus, the USAR TRM will continue to ensure adequate implementation of the existing test requirements removed from SR 4.5.2. Adequate regulatory controls exist through 10 CFR 50.59 to control any future changes to the relocated requirements. Therefore, with the proposed relocation of SR 4.5.2.f, the TS will continue to meet the requirements of 10 CFR 50.36 and adequate protection of public health and safety will be maintained.

Question 2:

TS LCO 3.5.2 requires two independent emergency core cooling system (ECCS) subsystems to be operable. SR 4.5.2.f requires each ECCS subsystem to be demonstrated operable by performing a vacuum leakage rate test on the watertight enclosure for decay heat removal system valves DH-11 and DH-12, to assure that the motor operators on the valves will not be flooded for at least 7 days following a loss-of-coolant accident (LOCA). The relocation of SR 4.5.2.f to USAR TRM will relax the immediate action required by the TS. Please explain any compensatory measures that will be implemented if this SR is moved to the USAR TRM.

DBNPS Response to Question 2:

The proposed relocation of SR 4.5.2.f is similar to the relocation of SR 4.5.2.h that was granted by License Amendment No. 256 on August 12, 2003 (DBNPS letter Log No. 6110). Concurrent with implementation of Amendment No. 256, USAR TRM Sections 3/4.5.2, "ECCS Subsystems - $T_{avg} \geq 280$ °F," and 3/4.5.3, "ECCS Subsystems - $T_{avg} < 280$ °F," were added to include the relocated surveillance requirement. The LCOs for these TRM sections require compliance with the applicable actions of the Technical Specifications in the event the relocated surveillance requirement is not met. The proposed relocation of SR 4.5.2.f is planned to be handled in a similar manner through revisions to these two TRM sections. An informational draft of the revised TRM sections is attached to this enclosure. In that the same TS actions will apply in the event that the SR is not met, regardless whether the SR is located in the TS or the TRM, the proposed relocation of the SR does not result in a relaxation of immediate actions required by TS, and no compensatory measures are required.

Question 3:

If SR 4.5.2.f is relocated to the USAR TRM, explain (1) what changes (if any) will be made to the vacuum leakage rate test requirements on the watertight enclosure, (2) what criteria are used to determine test acceptability, and (3) what assurance is provided that the electric motor operators on the valves will not be flooded following a LOCA.

DBNPS Response to Question 3:

An informational draft of the revised TRM sections is attached to this enclosure. The content of the relocated SR 4.5.2.f will be the same as the content of the current TS SR, however the SR will be reformatted to accommodate the format of the USAR TRM. As described above, any future changes will be subject to the controls of 10 CFR 50.59. The only change currently anticipated is a change in the surveillance frequency. As noted in Section 3.0 of LAR 03-0004, the DBNPS is currently operating on a 24-month fuel cycle, whereas SR 4.5.2.f is required to be performed at an 18-month frequency. Therefore, in the event that an outage of sufficient duration does not occur during an operating cycle, an early plant shutdown to perform the test may be necessary. Upon relocation of the SR to the USAR TRM, DBNPS personnel plan to perform an evaluation under the 10 CFR 50.59 process to determine if the current surveillance interval can be changed to a 24-month refueling interval frequency, based in large part on the modifications made to improve the sealing capability of the watertight enclosure. This would eliminate the need to perform the surveillance in mid-cycle outages, resulting in reduced radiation exposure to test personnel.

The surveillance test performed for SR 4.5.2.f is a vacuum leakage rate test. The decay heat valve enclosure is evacuated to a range of 11.85 to 12.00 inches of Hg Vacuum at the start of the test, and the vacuum decay is then observed over 4-hour period. The test acceptance criterion requires a minimum vacuum of 6.6 inches of Hg Vacuum at the end of the 4-hour period. The

initial vacuum creates a differential pressure for the enclosure equivalent to that created for the maximum flood in containment. The final vacuum acceptance criterion is a calculated value based on the following assumptions for the flooding scenario:

- A single leakage area at the lowest elevation of the decay heat valve enclosure;
- Differential pressure on the leakage area as a result of maximum containment flood;
- A beginning water level in the decay heat valve enclosure of 6-inches prior to the containment flooding to account for potential valve leakage that may have occurred in the enclosure prior to the LOCA;
- A resulting maximum water level in the flooded decay heat valve enclosure corresponding to the elevation that would provide a leakage pathway into the motor operator.

The test acceptance criterion assumes that the containment and decay heat valve enclosure air temperatures are equal and $\geq$ 65 °F. If the test acceptance criterion is not achieved, the surveillance test allows Engineering to evaluate acceptance of the test based on containment and decay heat valve enclosure temperatures recorded during the test.

The proposed SR relocation has no impact on the test acceptance criterion. In addition, the required surveillance testing will continue to be performed following relocation of the surveillance test requirements to the TRM, providing continued assurance that the electric motor operators on the valves will not be flooded following a LOCA.

Question 4:

As stated in the submittal, the Bases associated with TS 3/4.5.2 will also be relocated to the USAR TRM. However, the provisions of the TS Bases Control program will no longer apply to the relocated Bases. Please describe the administrative controls program for the USAR TRM.

DBNPS Response to Question 4:

The TRM is incorporated by reference into the USAR (Section 1.5.5) and changes to the USAR, including the TRM, are processed in accordance with a DBNPS administrative procedure and are subject to the controls of 10 CFR 50.59.

Question 5:

SR 4.5.2.f requires the watertight enclosure to be tested once per 18 months. The plant is currently operating on a 24-month fuel cycle. As stated in the submittal, the 18-month test frequency was added due to the design of the watertight enclosure, and was based upon performing testing at a refueling outage frequency rather than a fixed absolute time-span. To

avoid the need for performing the surveillance during mid-cycle outages, have you considered whether a change to the valve test interval to a 24-month frequency can be justified with a TS amendment, rather than making future changes to the relocated specification under 10 CFR 50.59?

DBNPS Response to Question 5:

FENOC previously considered this alternative approach in LAR 97-0007, submitted by letter dated March 30, 2001 (DBNPS letter Serial No. 2664). This LAR proposed to change the surveillance frequency for SR 4.5.2.f from 18 months to "each Refueling Interval," i.e., 24 months. Due to subsequent changes to the design of the DH enclosure in the Thirteenth Refueling Outage (13RFO), FENOC later withdrew LAR 97-0007 (letter dated December 20, 2002, DBNPS Serial No. 2823).

FENOC believes that the approach used in LAR 97-0007 was viable. However, when LAR 03-0004 was initiated, FENOC took into consideration prior discussions with the NRC/NRR Plant Systems Branch reviewer for LAR 97-0007. In a January 24, 2002 conference call to discuss the LAR 97-0007 submittal, the merits of using a relocation approach were discussed. Based on these discussions, when LAR 03-0004 was initiated, the relocation approach was selected.

Question 6:

The plant has two active means of boron precipitation control (BPC) that ensure the chemical additive concentration remains below its solubility limit throughout the post-accident cooling period. As stated in the submittal, the backup BPC method utilizes one of the two operating DH/LPI pumps taking suction from the DH "drop line" via valves DH-11 and DH-12, and discharges a throttled flow rate into the reactor vessel via the core flood nozzles. The submittal states that a plant modification is planned during the ongoing thirteenth refueling outage to add a new cross-tie line and associated valving that allow the discharge of either DH/LPI pump to backflow through the DH-11 and DH-12 drop line and into the reactor vessel. The new primary BPC method would still utilize a flow path through valves DH-11 and DH-12. Therefore, the watertight enclosure is always important to ensure that the valves will remain capable of opening following a LOCA. SR 4.5.2.f provides assurance that at least one BPC method will be available post-LOCA. Please explain the safety basis for the two valves, including their purposes for boron control and for decay heat removal.

DBNPS Response to Question 6:

The Decay Heat Removal System (DHRS) is connected to the Reactor Coolant System (RCS) hot leg via a single "dropline". Valves DH-11 and DH-12 are 12-inch motor-operated gate valves located in series in the dropline. These valves serve to isolate the DHRS from the higher pressure RCS during normal operation. DH-11 also serves as a containment isolation valve.

Downstream of DH-11, and outside containment, the dropline branches off to the two Decay Heat Pump suctions. During shutdown conditions, when RCS pressure is sufficiently low, the valves are required to open in order to place the DHRS in operation. In the event of a LOCA, the valves are also required to be capable of opening in order to provide a flowpath for BPC.

As discussed above, the surveillance testing that demonstrates the capability of the watertight enclosure will continue to be performed, regardless whether SR 4.5.2.f remains in the TS or is relocated to the USAR TRM, and when the SR is relocated to the TRM, any future changes to TRM will be subject to the controls of 10 CFR 50.59. Therefore, FENOC believes that the proposed relocation will have no impact on the ability of valves DH-11 and DH-12 to perform their safety function.

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Enclosure 1
Attachment

DRAFT USAR TRM PAGES

(4 pages follow)

Note: These pages are provided for information only.

3/4.5 EMERGENCY CORE COOLING SYSTEMS

FOR INFORMATION ONLY

3/4.5.2 ECCS SUBSYSTEMS - $T_{avg} \geq 280°F$

LCO 3.5.2 The requirements of TRM Surveillance Requirement 4.5.2 shall be performed.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
TRM Limiting Condition for Operation 3.5.2 not met.	Comply with the applicable Actions of Technical Specification 3/4.5.2	Immediately

SURVEILLANCE REQUIREMENT

SURVEILLANCE	FREQUENCY
4.5.2.1 ---------- - NOTE - Only the subsystem(s) directly affected by the flowpath modification needs to be tested in accordance with this Surveillance. ---------- Each HPI and LPI ECCS subsystem shall be demonstrated OPERABLE by performing a flow test, during shutdown, to verify the injection phase flow rate and flow distribution (for HPI only) meet or exceed the LOCA requirements.	Following completion of a modification to the subsystem flowpath that could alter the subsystem flow characteristics.
4.5.2.2 ---------- - NOTE - The inspection port on the watertight enclosure may be opened without requiring performance of the vacuum leakage rate test, to perform inspections. After use, the inspection port must be verified as closed in its correct position. Provisions of TS 3.0.3 are not applicable during these inspections. ---------- Each ECCS subsystem shall be demonstrated OPERABLE by performing a vacuum leakage rate test of the watertight enclosure for valves DH-11 and DH-12 that assures the motor operators on valves DH-11 and DH-12 will not be flooded for at least 7 days following a LOCA.	18 months AND After each opening of the watertight enclosure. AND After any maintenance on or modification to the watertight enclosure which could affect its integrity.

3/4.5.2 ECCS SUBSYSTEMS - $T_{avg} \geq 280°F$

The surveillance requirement for flow and flow distribution (HPI only) testing provides assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) ensure an amount of ECCS flow that is equal to or greater than the flow assumed in the ECCS-LOCA analyses, and (3) ensure proper flow distribution between HPI injection points, in accordance with the assumptions used in the ECCS-LOCA analyses.

The frequency of Surveillance 4.5.2.1 ensures that changes in system performance are detected and verified not to degrade the subsystem's ability to provide the flows that are required for accident mitigation. The HPI and LPI pumps are monitored in accordance with other surveillance requirements that specifically measure pump performance. Therefore, this surveillance does not apply to subsystem modifications that are limited to only the pumps.

The intent of Surveillance 4.5.2.1 is to verify that the subsystem flow characteristics have not been unacceptably altered by modifications that could affect the resistance of the subsystem flowpath. Taken together, the pump surveillances and this surveillance ensure that the LOCA analyses remain valid.

Surveillance 4.5.2.1 requires verification of flow rate and flow distribution (HPI only) for the injection phase. This may be accomplished by testing in an alternate system lineup (e.g., RCS recirculation) and verifying equivalent flow rates by calculation, as long as the affected portion of the flowpath is in the tested flowpath.

Decay Heat Removal System valves DH-11 and DH-12 are located in an area that would be flooded following a LOCA. These valves are located in a watertight enclosure to ensure their operability up to seven days following a LOCA. Surveillance Requirements are provided to verify the acceptable leak tightness of this enclosure. An inspection port is located on this watertight enclosure, which is typically used for performing inspections inside the enclosure. During the vacuum leakage rate test, the inspection port is in a closed position and subject to the test. This inspection port may be subsequently opened for use in viewing inside the enclosure. Opening this inspection port will not require performance of the vacuum leakage rate test because of the design of the closure fitting, which will preclude leakage under LOCA conditions, when properly installed. Proper installation includes independent verification.

3/4.5 EMERGENCY CORE COOLING SYSTEM

3/4.5.3 ECCS SUBSYSTEMS - T_{avg} < 280°F

FOR INFORMATION ONLY

LCO 3.5.3 The requirements of TRM Surveillance Requirement 4.5.3 shall be performed.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
TRM Limiting Condition for Operation 3.5.3 not met.	Comply with the applicable Actions of Technical Specification 3/4.5.3.	Immediately

SURVEILLANCE REQUIREMENT

	SURVEILLANCE	FREQUENCY
4.5.3.1	- NOTE - Only the subsystem(s) directly affected by the flowpath modification needs to be tested in accordance with this Surveillance.	
	Each LPI ECCS subsystem shall be demonstrated OPERABLE by performing a flow test, during shutdown, to verify the injection phase flow rate meets or exceeds the LOCA requirements.	Following completion of a modification to the subsystem flowpath that could alter the subsystem flow characteristics.
4.5.3.2	- NOTE - The inspection port on the watertight enclosure may be opened without requiring performance of the vacuum leakage rate test, to perform inspections. After use, the inspection port must be verified as closed in its correct position. Provisions of TS 3.0.3 are not applicable during these inspections.	
	One ECCS subsystem shall be demonstrated OPERABLE by performing a vacuum leakage rate test of the watertight enclosure for valves DH-11 and DH-12 that assures the motor operators on valves DH-11 and DH-12 will not be flooded for at least 7 days following a LOCA.	18 months AND After each opening of the watertight enclosure. AND After any maintenance on or modification to the watertight enclosure which could affect its integrity.

3/4.5.3 ECCS SUBSYSTEMS - T_{avg} < 280°F

The surveillance requirement for flow testing provides assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, and (2) ensure an amount of ECCS flow that is equal to or greater than the flow assumed in the ECCS-LOCA analyses.

The frequency of surveillance 4.5.3.1 ensures that changes in system performance are detected and verified not to degrade the subsystem's ability to provide the flows that are required for accident mitigation. The LPI pumps are monitored in accordance with other surveillance requirements that specifically measure pump performance. Therefore, surveillance 4.5.3.1 does not apply to subsystem modifications that are limited to only the pumps.

The intent of surveillance 4.5.3.1 is to verify that the subsystem flow characteristics have not been unacceptably altered by modifications that could affect the resistance of the subsystem flowpath. Taken together, the pump surveillances and this surveillance ensure that the LOCA analyses remain valid.

Surveillance 4.5.3.1 requires verification of flow rate for the injection phase. This may be accomplished by testing in an alternate system lineup (e.g., RCS recirculation) and verifying equivalent flow rates by calculation, as long as the affected portion of the flowpath is in the tested flowpath.

Decay Heat Removal System valves DH-11 and DH-12 are located in an area that would be flooded following a LOCA. These valves are located in a watertight enclosure to ensure their operability up to seven days following a LOCA. Surveillance Requirements are provided to verify the acceptable leak tightness of this enclosure. An inspection port is located on this watertight enclosure, which is typically used for performing inspections inside the enclosure. During the vacuum leakage rate test, the inspection port is in a closed position and subject to the test. This inspection port may be subsequently opened for use in viewing inside the enclosure. Opening this inspection port will not require performance of the vacuum leakage rate test because of the design of the closure fitting, which will preclude leakage under LOCA conditions, when properly installed. Proper installation includes independent verification.

Docket Number 50-346
License Number NPF-3
Serial Number 2996
Enclosure 2

COMMITMENT LIST

THE FOLLOWING LIST IDENTIFIES THOSE ACTIONS COMMITTED TO BY THE DAVIS-BESSE NUCLEAR POWER STATION (DBNPS) IN THIS DOCUMENT. ANY OTHER ACTIONS DISCUSSED IN THE SUBMITTAL REPRESENT INTENDED OR PLANNED ACTIONS BY THE DBNPS. THEY ARE DESCRIBED ONLY FOR INFORMATION AND ARE NOT REGULATORY COMMITMENTS. PLEASE NOTIFY THE MANAGER – REGULATORY AFFAIRS (419-321-8450) AT THE DBNPS OF ANY QUESTIONS REGARDING THIS DOCUMENT OR ANY ASSOCIATED REGULATORY COMMITMENTS.

COMMITMENTS	DUE DATE
Technical Specification Surveillance Requirement 4.5.2.f will be relocated to Technical Requirements Manual Sections 3/4.5.2 and 3/4.5.3 and the LCOs for these TRM sections will continue to require compliance with the applicable actions of the Technical Specifications in the event the relocated surveillance requirement is not met.	Concurrent with implementation of the proposed license amendment.
The content of the relocated SR 4.5.2.f will be the same as the content of the current TS SR, however the SR will be reformatted to accommodate the format of the USAR TRM.	Concurrent with implementation of the proposed license amendment.