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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 Revise Technical Specification (TS) 3/4.8.1.1, "A.C. Sources - Operating," and TS 3/4.8.1.2, "A.C. Sources - Shutdown" to Revise Electrical Power System Surveillance Requirements (License Amendment Request No. 01-0009, TAC No. MC4173)

Ladies and Gentlemen:

By letter dated August 20, 2004 (Serial Number 2957), the FirstEnergy Nuclear Operating Company (FENOC) submitted a license amendment application for the Davis-Besse Nuclear Power Station (DBNPS). The proposed amendment would revise Technical Specification (TS) Surveillance Requirement (SR) 4.8.1.1.1.b to be consistent with the DBNPS design basis requirements for offsite power sources. Additionally, TS 3/4.8.1.1 would be revised to delete SR 4.8.1.1.2.d.4, which requires verification that the Emergency Diesel Generator (EDG) auto-connected loads do not exceed the 2000-hour load limit. The proposed amendment would also revise TS 3/4.8.1.2, "A.C. Sources - Shutdown," to revise SR 4.8.1.2 to add additional exceptions to the Surveillance Requirements that must be performed for Modes 5 and 6. By facsimile on November 4, 2004, the NRC requested additional information regarding the proposed amendment. The FENOC responses to this request are provided in Attachment 1. Attachment 2 provides a list of regulatory commitments made in this submittal.

Should you have any questions or require additional information, please contact Mr. Henry L. Hegrat, Supervisor - Licensing, at (330) 315-6944.

A001

The statements contained in this submittal, including its associated attachments, are true and correct to the best of my knowledge and belief. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 6/16/05.

By: Steven A. Loelkein for
Mark B. Bezilla, Vice President - Nuclear

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Attachments

cc: J. L. Caldwell, Regional Administrator, NRC Region III
N. Dragani, Executive Director, Ohio Emergency Management Agency, State of Ohio (NRC Liaison)
W. A. Macon, DB-1 NRC/NRR Project Manager
C. S. Thomas, DB-1 NRC Senior Resident Inspector
Utility Radiological Safety Board

FENOC Response to NRC Request for Additional Information
Electrical Power Surveillance Requirements
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station

Question 1

TS Limiting Condition for Operation (LCO) 3.8.1.1, "A.C. Sources - Operating," requires, in part, that two qualified circuits between the offsite transmission network and the onsite Class 1E AC electrical power distribution system be operable. The TS bases indicates that an OPERABLE qualified offsite to onsite circuit consists of: One OPERABLE 345 kV transmission line, one OPERABLE 345 kV startup transformer, one OPERABLE 13.8 kV bus, and one OPERABLE 13.8 - 4.16 kV bus tie transformer. The Davis-Besse USAR conveys that an OPERABLE qualified offsite to onsite circuit (when one startup transformer is inoperable) could also consists [sic] of: One OPERABLE 345 kV transmission line, one OPERABLE main transformer, one OPERABLE auxiliary transformer, one OPERABLE 13.8 kV bus, and one OPERABLE 13.8 - 4.16 kV bus tie transformer.

a. The Davis-Besse TS appear to be inconsistent with the Davis-Besse USAR. Provide clarification.

b. Provide a draft markup of the USAR change that reflects the proposed change to the TS to eliminate testing of the manual transfer from the startup to auxiliary transformer power source.

c. In addition to one OPERABLE 345 kV transmission line, one OPERABLE 345 kV startup transformer, one OPERABLE 13.8 kV bus, and one OPERABLE 13.8 kV bus tie transformer, the Davis-Besse USAR indicates that an OPERABLE offsite to onsite circuit also consists of an OPERABLE 345kV switchyard and two OPERABLE 345kV transmission lines to substations located at Beaver, Lemoyne, or Bayshore. Describe how surveillance, required action and operability of these additional items are included in the Davis-Besse TS or provide justification for these items not being included as part of TS.

Response

a. The DBNPS TS and TS Bases are consistent with the USAR with respect to the description of a qualified offsite to onsite circuit. TS 3.8.1.1 requires two OPERABLE qualified circuits between the offsite transmission network and the onsite Class 1E A.C. electrical power distribution system. TS 3.8.1.1 does not define what constitutes a qualified circuit, but TS Bases Section 3/4.8 states, in part:

An OPERABLE qualified offsite to onsite circuit consists of:

1. One OPERABLE 345 kV transmission line
2. One OPERABLE 345 - 13.8 kV startup transformer, **or an OPERABLE main transformer and unit auxiliary transformer with the generator links removed ("backfeed" alignment), as described below**
3. One OPERABLE 13.8 kV bus, and
4. One OPERABLE 13.8 - 4.16 kV bus tie transformer as described below.

An OPERABLE qualified circuit from the transmission line through the main transformer and unit auxiliary transformer exists when the following conditions are met:

1. The plant is in MODE 3, 4, 5, or 6.
2. Each OPERABLE 13.8 kV bus is powered from the unit auxiliary transformer, and
3. If a startup transformer is OPERABLE, each OPERABLE 13.8 kV bus is configured to permit automatic transfer to an OPERABLE 345 - 13.8 kV startup transformer.

Essentially, the TS Bases define two possible configurations for an operable qualified offsite to onsite circuit. Both configurations start at a 345 kV transmission line and proceed through to a 13.8 - 4.16 kV bus tie transformer. The difference in configurations is that one connects through a startup transformer and the other connects through the unit main and auxiliary transformer backfeed alignment. The DBNPS USAR describes both of these configurations. USAR Section 8.2.1, "Description," states, in part:

> One or both of the two 345kV overhead lines to the startup transformers will be available to supply all essential loads within a few seconds of a loss-of-coolant accident. The third overhead line to the main and auxiliary transformers can be made available to supply all essential loads following a loss of all onsite alternating current power supplies by removing the generator main leads disconnecting links.

USAR Section 8.3.1.1.2, "13800 Volt Auxiliary System," states, in part:

> During startup and shutdown, each bus is fed from the 13.8kV secondary winding of either startup transformer No. 01 or No. 02, or, during operational Mode 3, 4, 5, 6, or defueled, backfed through the main power transformer and unit auxiliary transformer with the generator links removed.

Therefore, the DBNPS TS and TS Bases are consistent with the USAR with respect to the description of a qualified offsite to onsite circuit.

b. The USAR was reviewed to identify if any change to the USAR was needed to reflect the proposed change to the TS to eliminate testing of the manual transfer from the startup to auxiliary transformer power source. There are no planned changes to the USAR as a result of the TS change to eliminate testing of the manual transfer from the startup to auxiliary transformer power source.

c. The 345 kV transmission lines relied on for meeting TS 3.8.1.1 are considered part of the qualified offsite to onsite circuits as described in the TS Bases quoted in response to Request 1a. Components within the 345 kV switchyard may be part of a qualified offsite to onsite circuit or may perform functions that are required to support operability of the qualified offsite to onsite circuits. The need for these components is stated in TS Bases Section 3/4.8, which states:

> An OPERABLE qualified offsite to onsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E essential buses.

If the removal from service or failure of any transmission line or switchyard component resulted in fewer than the required number of qualified offsite circuits being operable, compliance with either the appropriate Action of TS 3.8.1.1 or TS 3.0.3 would be required.

Surveillance testing performed in accordance with TS SR 4.8.1.1.1.a includes the following verifications of 345 kV transmission line and switchyard component status:

- Verification of the connection status of the remote end of each 345 kV transmission line by contacting the system dispatcher.
- Verification of positions of air-blast circuit breakers, air break switches, and disconnect switches.
- Verification of voltage on the switchyard J and K Busses.

The surveillance test procedures that currently implement TS SR 4.8.1.1.1.b include verification of automatic and manual "transfers" to each of the 345 kV transmission lines. These "transfers" do not generally meet the plain meaning of the word "transfer" because there is no clear change from one power source to another. For example, the test to manually "transfer" station loads to the Bay Shore line through Startup Transformer 1, initially has all three offsite circuits electrically connected to Startup Transformer 1 with the station loads aligned to Startup Transformer 1. The test then directs the opening of circuit breakers to separate the Lemoyne and Ohio Edison lines from Startup Transformer 1. There is no clear change from one power source to another since the Bay Shore line is an available power source prior to the "transfer" and is the sole power source following the

"transfer." Under the proposed change to TS 4.8.1.1.1.b, verification of these "transfers" would not be required by the TSs.

Neither automatic nor manual transfers between 345 kV transmission lines are relied on to satisfy General Design Criterion (GDC) 17. For an offsite to onsite circuit to satisfy TS 3.8.1.1.a, an unbroken circuit must exist between a transmission line and a startup transformer. Since two such circuits are required, there is no need to transfer the source for either startup transformer from one transmission line to another to assure GDC 17 is satisfied.

Switchyard components do perform functions that are necessary to ensure adequate reliability of the offsite power sources. For example, proper operation of breakers, switches, and protective relaying is needed to ensure that a single failure does not result in a loss of two qualified offsite to onsite circuits. However, consistent with the guidance of NUREG-1430, *Standard Technical Specifications - Babcock and Wilcox Plants*, testing and maintenance of these devices would not be included in the DBNPS Technical Specifications. The DBNPS USAR Section 8.3.1.1.9 would continue to provide for testing of these components. This section states, in part:

> The 345kV circuit breakers will be inspected, maintained and tested on a routine basis. This can be accomplished without removing the generator, transformers and transmission lines from service.
>
> Transmission line protective relaying will be tested on a routine basis. This can be accomplished without removing the transmission lines from service. Generator and unit auxiliary transformer relaying will be tested when the generator is off line. Startup transformer relaying will be tested while the transformer is off the line.

Question 2

The Davis-Besse design for essential bus D1 and C1 includes an automatic and manual transfer from one offsite circuit to the remaining offsite circuit.

a. To what extent is TS required testing of this transfer from one to the remaining offsite circuit affected by the proposed TS change.

b. Describe the extent this transfer from one to the remaining offsite circuit is credited as part of the design or licensing bases for meeting the requirements of GDC 17 for offsite circuits.

Response

a. FENOC does not credit the manual and automatic transfers of essential 4.16 kV busses C1 and D1 to meet GDC 17 criteria. The 345 kV and 13.8 kV Systems provide sufficient redundancy to meet the requirements of GDC 17. Since the C1 and D1 bus transfer capabilities are not credited with helping to meet GDC 17 criteria, these transfers are not tested during Technical Specification Surveillance Testing. The transfers of the 4.16 kV busses are tested during periodic testing scheduled every other refueling outage. Therefore, testing of the C1 and D1 transfers is not affected by the proposed TS changes.

b. As noted above, FENOC does not credit the manual and automatic transfers of essential 4.16 kV busses C1 and D1 to meet GDC 17 criteria.

Question 3

The USAR indicates that the offsite system meets GDC 17 with any single component associated with the two offsite circuits out of service (such as one startup transformer or one switchyard breaker). Describe the automatic and manual transfers needed to meet the requirements of GDC 17 when a single component is out of service. Describe the extent testing of these transfers are [sic] included in current TS and will be included as part of the proposed TS.

Response

USAR Section 8.2.1.1 states, in part:

> Providing all switchyard circuits, breakers, and transformers are in service, there are no known aspects of the Davis-Besse design that do not meet the requirement of General Design Criterion (GDC) 17. A switchyard circuit or breaker(s) can be removed from service ***and where sufficient equipment remains in service and in an acceptable configuration***, the remaining circuits, breakers, and transformers will still meet the requirements of GDC 17. (emphasis added)

Although this statement could be interpreted to indicate that the offsite system meets GDC 17 with any single component associated with the two offsite circuits out of service, it is intended to convey that GDC 17 *may* be satisfied even with a single component out of service, but there are situations where removal of a single component from service would result in the remaining components not satisfying GDC 17. In such situations, less than the two required qualified offsite to onsite circuits would exist, and action would be required in accordance with TS 3.8.1.1. USAR Section 8.2.1.1 will be revised to clarify this paragraph.

For configurations where two qualified offsite circuits are considered operable, and hence GDC 17 is satisfied, the only transfers relied on to satisfy GDC 17 are those automatic transfers

involving the power supply for the 13.8 kV busses (i.e., the startup and auxiliary transformers). Testing of these automatic transfers is currently performed by demonstrating the capability of transferring automatically each 13.8 kV bus power supply from the unit auxiliary transformer to each startup transformer circuit, and from each startup transformer circuit to the other startup transformer circuit. Under the proposed change, only the automatic transfer of each 13.8 kV bus power supply from the unit auxiliary transformer to each startup transformer circuit would be tested under SR 4.8.1.1.1.a.

Question 4

Electric power from the transmission network to the onsite electric distribution system is required (pursuant with GDC 17) to be supplied by two physically independent circuits. Each of these circuits is required to be designed to be available in sufficient time following a loss of all onsite ac power supplies and the other offsite electric power circuit, to assure that fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. Given a loss of offsite power due to a component failure in one of the two offsite circuits and the unavailability of onsite power, describe the extent manual switching (such as opening breakers or disconnect switches or links or transferring power from an alternate source) is necessary to reestablish offsite power from the remaining offsite circuit to assure that fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. Describe the extent testing of this manual switching is included in current TS and will be included as part of proposed TS. Provide justification for not including this manual switching as part of TS.

Response

With a loss of one offsite circuit due to component failure and the unavailability of onsite power, the unaffected offsite circuit would continue to provide power to at least one of the two redundant divisions of essential A. C. busses without the need for any manual switching. One division of essentially powered loads is sufficient to assure fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. As an added reliability feature, the 13.8 kV bus affected by component failure or unavailability of offsite power would fast dead transfer to the other startup transformer provided there was a protective relaying actuation. This transfer would occur with a protective relaying actuation associated with the other startup transformer, 345 kV Bus J or K, or the Ohio Edison 345 kV line. This fast dead transfer would also require the manual pre-selection of the reserve source via the reserve source selector switch. If voltage was lost due to a loss of grid voltage or an inadvertent breaker or switch operation without any protective relay actuation, then manual actions may be required to restore the offsite circuit. Such a situation may either require the manual transfer of a 13.8 kV bus to another source of power or just re-closing the breaker or switch erroneously opened. Normally, a loss of voltage to Essential Bus C1 or D1 would result in the associated bus being supplied by its respective Emergency Diesel Generator.

In order to identify required power source transfers, the normal and alternate electrical lineups with two qualified offsite circuits operable during startup and shutdown and during normal power operation are described below.

During the station startup and shutdown, the unit auxiliary transformer and Startup Transformers 01 and 02 function as follows. The normal and alternate configurations may be used when both startup transformers are available. The auxiliary transformer backfeed configuration can serve as qualified offsite circuit in Modes 3, 4, 5 and 6.

NORMAL

Startup Transformer 01 supplies 13.8 kV power to Bus A and serves as a reserve source to 13.8 kV Bus B.

Startup Transformer 02 supplies 13.8 kV power to Bus B and serves as a reserve source to 13.8 kV Bus A.

ALTERNATE

Startup Transformer 02 supplies 13.8 kV power to Bus A and serves as a reserve source to 13.8 kV Bus B.

Startup Transformer 01 supplies 13.8 kV power to Bus B and serves as a reserve source to 13.8 kV Bus A.

AUXILIARY TRANSFORMER BACKFEED

Unit Auxiliary Transformer supplies 13.8 kV power to Bus A and Startup Transformer 01 (02) is the reserve source to Bus A.

Unit Auxiliary Transformer supplies 13.8 kV power to Bus B and Startup Transformer 01 (02) is the reserve source to Bus B.

In the normal or alternate configuration, loss of Startup Transformer 01 (02) would result in automatic transfer of the affected bus to Startup Transformer 02 (01) if initiated by protective relay actions, and both 13.8 kV buses would be supplied from Startup Transformer 02 (01). Even if the automatic transfer failed, the offsite circuit through the unaffected startup transformer would continue to provide power to one division of essentially powered loads. Therefore, the manual and automatic transfers of the 13.8 kV busses between the Startup Transformers are not required to satisfy GDC 17 in these configurations. These transfers would not be tested under the revised SR 4.8.1.1.1.a. In the auxiliary transformer backfeed configuration, loss of the auxiliary transformer would result in transfer of both 13.8 kV buses to the selected reserve Startup

Transformer. These transfers are currently tested by TS SR 4.8.1.1.1.a and would continue to be tested under the revised TS SR 4.8.1.1.1.a.

During normal station operation, the Unit Auxiliary Transformer will function as follows:

- Unit Auxiliary Transformer and Startup Transformers 01 and 02 available

  NORMAL

  Unit Auxiliary Transformer supplies 13.8 kV power to Bus A and Startup Transformer 01 is the reserve source to Bus A.

  Unit Auxiliary Transformer supplies 13.8 kV power to Bus B and Startup Transformer 02 is the reserve source to Bus B.

  ALTERNATE

  Unit Auxiliary Transformer supplies 13.8 kV power to Bus A and Startup Transformer 02 is the reserve source to Bus A.

  Unit Auxiliary Transformer supplies 13.8 kV power to Bus B and Startup Transformer 01 is the reserve source to Bus B.

In either the normal or alternate configuration, each 13.8 kV bus automatically transfers to the bus's selected reserve Startup Transformer upon loss of the Unit Auxiliary Transformer. These transfers are currently tested by TS SR 4.8.1.1.1.a and would continue to be tested under the revised TS SR 4.8.1.1.1.a.

Existing surveillance testing performs manual and automatic testing of the 13.8 kV busses from the Auxiliary Transformer to each Startup Transformer and tests the manual and automatic transfers of the 13.8 kV busses between the Startup Transformers. The new TS Surveillance testing would verify the automatic and manual transfer of the 13.8 kV busses from the Unit Auxiliary Transformer to the Startup Transformers. The new surveillance testing would not require the manual and automatic transfers of the 13.8 kV busses between Startup Transformers. This change in surveillance testing scope is acceptable because the new testing scope would ensure the required transfer capabilities in the normal and alternate system configurations are tested without requiring the testing of transfer schemes for abnormal configurations. The bus transfer capability is discussed in USAR Section 8.3.1.1.2 and these transfer capabilities would continue to be tested on a periodic basis. In situations where a startup transformer is already supplying power to a 13.8 kV bus, transfer of that circuit to another source of power is not needed to satisfy GDC 17. This proposed change is consistent with the NUREG-1430, Standard Technical Specifications - Babcock & Wilcox Plants. This change will continue to ensure adequate transfer testing continues to be performed to meet the design basis.

Question 5

As part of initial licensing, SR 4.8.1.1.2.d.4 was included in TS to assure that DG loading (the normally connected loads plus the automatically connected loads following a loss of offsite power and/or accident) will not exceed the 2000 hour rating of the DG. Position 2 of safety guide 9 conveys that the predicted loads (at the operating license stage of review) should not exceed the smaller of the 2000 hour rating or 90 percent of the 30 minute rating of the set. It is our understanding that predicted loads for the Davis-Besse DGs at the operating license stage of review exceeded the smaller of the 2000 hour rating or 90 percent of the 30-minute rating of the set; thus to assure the DG would not be automatically overloaded following an accident, SR 4.8.1.1.2.d.4 was included as part of TS. Provide a commitment to be included as part of the USAR that any combination of normally connected and operating connected loads and loads that are automatically connected following a loss of offsite power and/or LOCA will not exceed the smaller of the 2000 hour rating or 90 percent of the 30-minute rating of the DG set.

Response

Consistent with the existing USAR and TS requirements, FENOC will revise the USAR prior to or concurrent with implementation of the requested license amendment to state that the permanent and auto-connected loads for each emergency diesel generator do not exceed the smaller of the 2000 hour rating or 90 percent of the 30-minute rating.

Question 6

During Modes 5 and 6, LCO 3.8.1.2 requires one qualified circuit between the offsite transmission network and the onsite Class 1E ac electrical power distribution system. For each qualified circuit credited for use during Modes 5 and 6, identify manual and automatic switching utilized to power essential loads from the transmission network through the qualified circuit. Justify why a TS surveillance requirement for each identified manual and automatic switching is not required pursuant with the requirements of 10 CFR 50.36 during Modes 5 and 6.

Response

There are no transfers of electrical busses needed to meet Mode 5 and 6 requirements. Only one offsite circuit is required in Modes 5 and 6 and that circuit would be powering the safety-related bus. Therefore, no transfers are needed to support this requirement.

Docket Number 50-346
License Number NPF-3
Serial Number 3142
Attachment 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 Supervisor - Licensing (330-315-6944) of any questions regarding this document or any associated regulatory commitments.

COMMITMENTS	DUE DATE
USAR Section 8.2.1.1 states, in part: Providing all switchyard circuits, breakers, and transformers are in service, there are no known aspects of the Davis-Besse design that do not meet the requirement of General Design Criterion (GDC) 17. A switchyard circuit or breaker(s) can be removed from service and where sufficient equipment remains in service and in an acceptable configuration, the remaining circuits, breakers, and transformers will still meet the requirements of GDC 17. USAR Section 8.2.1.1 will be revised to clarify this paragraph.	N/A
FENOC will revise the USAR to state that the permanent and auto-connected loads for each emergency diesel generator do not exceed the smaller of the 2000 hour rating or 90 percent of the 30-minute rating.	Prior to or concurrent with implementation of the requested license amendment