



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 22, 2016

Mr. Brian D. Boles
Site Vice President
FirstEnergy Nuclear Operating Company
Mail Stop A-DB-3080
5501 North State, Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 – REQUEST FOR
ADDITIONAL INFORMATION REGARDING AMENDMENT REQUEST TO
REVISE EMERGENCY ACTION LEVEL SCHEME (CAC NO. MF7364)

Dear Mr. Boles:

By application dated February 17, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16049A513), FirstEnergy Nuclear Operating Company submitted a license amendment request for Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1. The proposed amendment would change the emergency plan for DBNPS by revising the emergency action level scheme based on the Nuclear Energy Institute's (NEI's) guidance in NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors."

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your submittals and has determined that additional information is required to complete the review. A response to the enclosed request for additional information is requested to be provided within 45 days from the date of this letter. In addition, the response should identify any additional changes beyond the scope of this request and include a revised version of the Emergency Action Level Technical Bases document.

B. Boles

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If you have any questions regarding this request please contact me at (301) 415-1380.

Sincerely,

A handwritten signature in black ink, appearing to read 'Blake Purnell', with a stylized flourish extending to the right.

Blake Purnell, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
AMENDMENT REQUEST TO CHANGE EMERGENCY ACTION LEVEL SCHEME
FIRSTENERGY NUCLEAR OPERATING COMPANY
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1
DOCKET NO. 50-346

By application dated February 17, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16049A513), FirstEnergy Nuclear Operating Company (the licensee) submitted a license amendment request for Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1. The proposed amendment would change the emergency plan for DBNPS by revising the emergency action level scheme based on the Nuclear Energy Institute's (NEI's) guidance in NEI 99-01, Revision 6, "Development of Emergency Action Levels [EALs] for Non-Passive Reactors," (ADAMS Accession No. ML12326A805). NEI 99-01, Revision 6, was endorsed by the U.S. Nuclear Regulatory Commission (NRC) by letter dated March 28, 2013 (ADAMS Package Accession No. ML13091A209).

The NRC staff is reviewing your submittals and has determined that additional information is required to complete the review.

RAI 1

Section 2.5, "Technical Basis Information," of the EAL Technical Bases document describes the general format used for the EAL Bases. Under the "Basis" subheading, Section 2.5 states:

A Generic basis section that provides a description of the rationale for the EAL as provided in NEI 99-01 Rev. 6. This is followed by a Plant-Specific basis section that provides DBNPS-relevant information concerning the EAL.

This format is different than the format in NEI 99-01, Revision 6. The potential exists for decision-makers to be confused between these two sections if the information appears to be inconsistent. Justify having two separate bases sections or revise accordingly to eliminate potential confusion by the user.

RAI 2 (EAL HU2.1)

Proposed EAL HU2.1 is for a seismic event greater than the operating bases earthquake (OBE).

- a. The DBNPS basis for proposed EAL HU2.1 states that the OBE is ground motion acceleration of 0.08 g horizontally or 0.053 g vertically. Proposed EAL HU2.1 relies upon the OBE alarm on seismic alarm panel C5764A. The DBNPS basis for this EAL indicates that this alarm is for an earthquake of 0.08 g or greater. Thus, it appears that this proposed EAL would only address a seismic event exceeding the 0.08 g horizontal

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acceleration OBE. Explain how a seismic event that exceeds the vertical acceleration OBE, but not the horizontal acceleration OBE, would be declared under this EAL, or revise accordingly.

- b. Section 4.6, "Basis Document," of NEI 99-01, Revision 6, states:

A Basis section should not contain information that could modify the meaning or intent of the associated IC [initiating condition] or EAL. Such information should be incorporated within the IC or EAL statements, or as an EAL Note. Information in the Basis should only clarify and inform decision-making for an emergency classification.

The DBNPS basis for the proposed EAL HU2.1 states:

When the Seismic Monitoring Cabinet key locked switch is placed in OFF, ALL OBE and SSE [Safe Shutdown Earthquake] alarms and cabinet recording functions (TNC 8.3.3 functions 1 and 3 and the DBRM-EMER-5003 Seismic Event Detection function) are nonfunctional. Therefore, the Compensatory Measures listed in DBRM-EMER-5003, Equipment Important to Emergency Response for a loss of the Seismic Event Detection function are required to be employed by the operators to determine if an earthquake occurs and to determine the magnitude of the event in a timely manner. . . .

This statement appears to modify the proposed EAL. If the licensee intends to have a compensatory EAL for when seismic monitoring equipment is out of service, then this needs to be incorporated into the actual EAL (using 'OR' logic) or as a note for the EAL, and the basis section clarified accordingly. Otherwise, this statement should be removed from the basis for the proposed EAL. If a compensatory EAL is added, explain how the timing of this EAL declaration would be affected.

RAI 3 (EALs HU4.1 and HU4.2)

Proposed EALs HU4.1 and HU4.2 are for fires that potentially degrade the level of safety of the plant.

- a. As part of the proposed EAL HU4.1, the licensee lists fire detection indications including "Receipt of multiple (more than 1) fire alarms" (2nd bullet). This differs from the associated NEI 99-01, Revision 6, guidance which lists "Receipt of multiple (more than 1) fire alarms or indications." The licensee stated that deletion of "or indications" was based upon it being redundant.

This EAL is intended to ensure that decision-makers consider multiple sources of information when an actual fire exists in order to make the appropriate EAL classification. The NEI 99-01, Revision 6, basis for this EAL states: "In addition to alarms, other indications of a FIRE could be a drop in fire main pressure, automatic activation of a suppression system, etc." Revise the EAL to include "or indications" in bullet 2, or provide further justification for removal.

- b. The NEI 99-01 guidance for HU4 states that for both emergency declaration and fire duration the clock starts at the time the fire alarm, indication, or report is received, and not the time that a subsequent verification was performed. The DBNPS basis information for proposed EALs HU4.1 and HU4.2 has many statements that are not consistent with the NEI 99-01 guidance and may cause confusion as to when this particular EAL is to be declared or when the clock starts for classification purposes.

Clarify the basis section for EALs HU4.1 and HU4.2 related to EAL classification timeliness and clock start. If differences from NEI 99-01, Revision 6, are desired, provide justification for each difference and explain how these differences impact classification timeliness. In particular, explain the terms “credible” and “valid” so that a decision-maker can determine if it is acceptable to delay classification in order to determine validity or to wait until a credible source notifies the control room of a fire.

- c. The developer notes in NEI 99-01, Revision 6, for EAL HU4 state: “The ‘site-specific list of plant rooms or areas’ should specify those rooms or areas that contain SAFETY SYSTEM equipment.” The areas listed in Table H-1, “Safe Shutdown Fire Areas,” of the DBNPS EAL basis document may be overly broad and result in an emergency declaration under HU4.1 or HU4.2 for a fire in a room that does not contain safety systems. Confirm that Table H-1 is sufficiently detailed to ensure that unnecessary emergency declarations are not made or revise the list accordingly.
- d. Proposed EAL HU4.1 requires the notification of an unusual event if a fire is not extinguished within 15 minutes under certain conditions. Proposed EAL HU4.2 requires the notification of an unusual event if a fire is not verified within 30 minutes under certain conditions. The DBNPS basis section for proposed HU4.2 discusses the extinguishing of a fire, but the extinguishing of a fire is not part of the criteria for EAL HU4.2. If a fire is proven to exist, then EAL HU4.1 would apply. Clarify the basis for EAL HU4.2 with respect to extinguishing a fire.

RAI 4 (EALs HA5.1, HS6.1, and RA3.2)

Proposed EALs HA5.1 and RA3.2 is for hazardous gas releases and radiation levels, respectively, that impede access to equipment necessary for normal plant operations, cooldown, or shutdown. Proposed HS6.1 is for the inability to control a key safety function following a control room evacuation.

NEI 99-01, Revision 6, EALs HA5, HS6, and AA3 provide guidance applicable to DBNPS proposed EALS HA5.1, HS6.1, and RA3.2, respectively. The NEI guidance indicates that these EALs are applicable in all modes. However, the licensee’s proposed EALs limit the applicability but the bases for these EALs do not explain why. Clarify the bases for these EALs to indicate that they were evaluated for all modes and explain why they were limited to the specified modes.

RAI 5 (EALs RG1.1, RS1.1, RA1.1, and RU1.1)

Proposed EALs RG1.1, RS1.1, RA1.1, and RU1.1 are for the release of radioactive gases. The threshold values for the noble gas monitors for these EALs have all been reduced from the

previously approved EAL scheme for DBNPS (ADAMS Accession No. ML083450120). Explain why these values have been reduced when the bases for these EALs has not changed.

RAI 6 (EAL RA2.1)

Proposed EAL RA2.1 is for the uncovering of irradiated fuel in the refueling pathway and is referenced as an Unusual Event. However, it appears this should be categorized as an Alert. Revise EAL RA2.1 to correct this issue.

RAI 7 (EALs CG1.1 and CS1.1)

Proposed EALs CG1.1 and CS1.1 are for the loss of reactor coolant system (RCS) inventory and are applicable in modes 5 and 6. These EALs include readings from the Refueling Bridge Portable Area Radiation Monitor. The DBNPS bases for these EALs state: "The Refuel Bridge Portable Radiation Monitor, when installed during refueling operations, is designed to provide monitoring of radiation due to a fuel handling event or loss of shielding during refueling operations."

As written, proposed EALs CG1.1 and CS1.1 cannot be fully implemented since the Refueling Bridge Portable Area Radiation Monitor is not always available during the applicable modes. Either revise these EALs to indication that the monitor may be used when installed during refueling operations or revise the bases to indicate that the monitor will be available during the applicable modes.

RAI 8 (EALs CU2.1, SA1.1, and SU1.1)

Proposed EALs CU2.1, SA1.1, and SU1.1 are for the loss of alternating current (ac) power sources to essential buses.

- a. Proposed EALs CU2.1, SA1.1, and SU1.1 reference tables which list transformer "X11 (back-fed via Main Transformer)" as an offsite power source. The DBNPS bases for these EALs state: "Credit for the X11 back-feed can only be taken if already aligned, as it takes greater than 15 minutes to align." As noted previously, the bases should not modify the IC or EAL. Revise the listing of transformer "X11 (back-fed via Main Transformer)" to clarify that it can be credited as an offsite source if already aligned.
- b. Proposed EALs SA1.1 and SU1.1 reference tables listing transformer "X11" and "X11 (back-fed via Main Transformer)" as offsite power sources. The DBNPS bases for these EALs state:

The essential buses during plant operation are normally powered from the 13.8KV [kilovolt] offsite power system through their respective 13.8KV/4160V [volt] bus tie transformers, via the Unit Auxiliary Transformer (X11). In non-power operating modes, the essential buses may be back-fed via the X11 and Main Transformer provided the main generator lead disconnect links are removed. . . .

The two listings of transformer X11 may cause confusion. Revise the tables for SA1.1 and SU1.1 to clarify the use of transformer X11 as an offsite power source or justify the current listing.

RAI 9 (EALs CA2.1, SG1.1, SG1.2, and SS1.1)

Proposed EALs CA2.1, SG1.1, and SS1.1 are for the loss of all ac power sources to essential power buses. Proposed EAL SG1.2 is for the loss of all essential ac and direct current power sources. The NEI 99-01, Revision 6, guidance uses the following wording as part of these EALs: "Loss of ALL offsite and ALL onsite AC Power to (site-specific emergency buses). . . ." Proposed EALs SG1.1, SG1.2, and SS1.1, contain the following wording: "Loss of ALL offsite and ALL onsite AC power capability, Table S-1, to essential 4160V buses C1 and D1 . . .", where Table S-1 lists offsite and onsite ac power sources. Proposed EAL CA2.1 has similar wording except it refers to Table C-2.

The focus of these EALs is on a complete loss of power to essential buses. Tables S-1 and C-2 appear to be unnecessary and may cause confusion. In addition, alternative power sources, such as those used for a mitigation strategy, may be able to power the essential buses. Revise these EALs to remove Tables S-1 and C-2 or justify their use with these EALs.

RAI 10 (CU5.1, CU5.2, CU5.3, SU7.1, SU7.2, and SU7.3)

Proposed EALs CU5.1, CU5.2, CU5.3, SU7.1, SU7.2, and SU7.3 address the loss of communications equipment.

- a. Emergency notifications to offsite response organizations and to the NRC are expected to be made from the control room. If satellite phones or cellular phones cannot be used in the control room due to radio frequency interference, then they should not be included in the list of available communications methods for EALs CU5.1, CU5.2, CU5.3, SU7.1, SU7.2, and SU7.3. Remove satellite phones and cellular phones from the list of available communications methods or justify retaining them on the list.
- b. Satellite phones are included in the list of available communication methods for EALs CU5.1, CU5.2, CU5.3, SU7.1, SU7.2, and SU7.3. Explain how satellite phones can be used inside a building, where a responder is protected from radiological hazards, or remove them from the list.
- c. Cellular phones are included in the list of available communication methods for EALs CU5.1, CU5.2, CU5.3, SU7.1, SU7.2, and SU7.3. The NEI guidance associated with these EALs indicates that credit for personal devices should not be credited. Remove cellular phones from the list or clarify the list to indicate that they are dedicated phones.

RAI 11 (EALs SA3.1 and SU3.1)

Proposed EALs SA3.1 and SU3.1 are for the loss of control room indications. The associated NEI 99-01, Revision 6, guidance for these EALs list RCS level as one of the important parameters for monitoring. The NEI 99-01 developer notes state that either the pressurizer or reactor vessel level may be specified in the EAL in place of RCS level. The proposed EALs SA3.1 and SU3.1 do not include RCS level or one of the alternatives in the list of safety system

parameters. Justify not including RCS level in the list of safety system parameters for these EALs or revise the list to include RCS level or an equivalent parameter.

RAI 12 (EAL SU4.1)

Proposed EAL SU4.1 is for reactor coolant activity greater than the technical specification allowable limits.

- a. Explain why instrument RE 1998 is called the "Letdown Monitor" in proposed EAL SU4.1 and the "Failed Fuel Monitor" in the basis section. Clarify the EAL and basis accordingly.
- b. The DBNPS basis section states: "A monitor value of 2.0E+06 (0.1% clad damage) was chosen for its ability to be recognized even though exceeding Technical Specification Limits could potentially result in much higher readings. . . ." The NEI 99-01, Revision 6, developer notes applicable to this EAL state:

The monitor reading values should correspond to an RCS activity level approximately at Technical Specification allowable limits.

If there is no existing method/capability for determining this EAL, then it should not be included.

Provide justification for including EAL SU4.1 when it appears that the monitoring instrument reading would not correspond to an RCS activity level near the technical specification limits.

RAI 13 (EAL SU5.1 and NEI 99-01, Revision 6, EAL SU4)

NEI 99-01, Revision 6, SU4 provides guidance for the notification of an unusual event for RCS leakage, which includes three separate EALs:

- SU4.1 is for unidentified and pressure boundary RCS leakage;
- SU4.2 is for identified RCS leakage; and
- SU4.3 is for RCS leakage to a location outside of containment.

Proposed DBNPS EAL SU5.1 would require an unusual event to be declared for RCS leakage greater than 10 gallons per minute (gpm) for greater than or equal to 15 minutes. DBNPS does not distinguish between the different types of leakage as recommended in NEI 99-01. The DBNPS basis states:

DBNPS does not have the capability to classify leakage as identified leakage within 15 minutes. Therefore, for the purpose of this IC and EAL all RCS leakage is considered unidentified leakage and the 10 gpm leak rate applies.

- a. The NEI guidance for EAL SU4.3 specifies a threshold of 25 gpm, which is greater than the 10 gpm threshold for the DBNPS EAL SU5.1. Justify why NEI EAL SU4.3 was not developed for DBNPS, taking into consideration the difference in the thresholds.

- b. The currently approved EAL scheme for DBNPS includes EALs similar to NEI SU4.1 and SU4.2. In addition, the statement from the DBNPS basis does not appear to consider that there can be previously identified leakage. Explain in further detail why EAL SU5.1 could not include identified leakage as a threshold given that it is currently approved for DBNPS.

B. Boles

- 2 -

If you have any questions regarding this request please contact me at (301) 415-1380.

Sincerely,

/RA RHaskell for/

Blake Purnell, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Request for Additional Information

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