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

July 27, 2011

Barry S. Allen, Vice President
Davis-Besse Nuclear Power Station
FirstEnergy Nuclear Operating Company
5501 North State Route 2
Oak Harbor, OH 43449

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE DAVIS-BESSE NUCLEAR POWER STATION (TAC NO. ME4640)

Dear Mr. Allen:

By letter dated August 27, 2010, FirstEnergy Nuclear Operating Company, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54 for renewal of Operating License NPF-3 for the Davis-Besse Nuclear Power Station. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." During its review, the staff has identified areas where additional information is needed to complete the review. The staff's request for additional information is included in the enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Cliff Custer, of your staff, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-2946 or by e-mail at Samuel.CuadradoDeJesus@nrc.gov.

Sincerely,

Samuel Cuadrado-De Jesús, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
As stated

cc w/encl: Listserv

DAVIS-BESSE NUCLEAR POWER STATION
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION

RAI B.2.3-5

Background:

In response to a U.S. Nuclear Regulatory Commission (NRC or the staff) Request for Additional Information (RAI) B.2.3-2, in its letter dated June 3, 2011, FirstEnergy Nuclear Operating Company (the applicant) stated that periodic testing of contaminants by the Air Quality Monitoring Program is performed each year, and that the frequency of testing is based on the recommendations of the Institute of Nuclear Power Operations (INPO) Supplemental Operating Experience Report (SOER) 88-1, "Instrument Air System Failures," which recommends periodic monitoring of air quality at several points throughout the instrument air system. Additionally, the SOER recommends that system air quality, as measured at the discharge of the air dryers and after filters, should be maintained within the requirements of ANSI Standard ISA-S7.3. ANSI Standard ISA-S7.3 has been withdrawn and replaced with ANSI/ISA-7.0.01-1996. While ISA-S7.3 did not specify a frequency for checking the dew point, ANSI/ISA-7.0.01-1996 recommends per shift monitoring of the dew point if a monitored alarm is not available.

Generic Aging Lessons Learned (GALL) Aging Management Program (AMP), XI.M24, "Compressed Air Monitoring," under the "Detection of Aging Effects," program element states:

> *[t]he program periodically samples and tests the air quality in the compressed system for moisture in accordance with industry standards, such as ANSI/ISAS7.0.01-1996. Typically, compressed systems have in-line dew point instrumentation that either checks continuously using an automatic alarm system or is checked at least daily to ensure that moisture content is within specifications.*

Issue:

If the dew point is not maintained well below the system operating temperature (at least 18 degrees F below the minimum local ambient temperature), condensation could occur. As recommended in the GALL Report, steel and stainless steel piping, piping components, and piping elements exposed to condensation should be managed for loss of material, and the Compressed Air Monitoring Program is an acceptable program to manage aging.

Based on the current industry standard and recommendations in the GALL Report, it is not clear to the staff how periodic testing once a year ensures that the dew point is maintained well below the system operating temperature during normal operation, and that condensation is not occurring internally.

ENCLOSURE

Request:

Justify how periodic testing once a year ensures that the dew point is maintained well below the system operating temperature during normal operation, as well as during outages and maintenance, such that the environment remains "dry-air."

RAI B.2.28-1

Background:

License renewal application (LRA) Section B.2.28 describes the existing Nickel-Alloy Management Program as plant-specific. The applicant states that their program manages primary water stress corrosion cracking for nickel-alloy pressure boundary components, other than reactor vessel closure head nozzles and steam generator tubes, exposed to reactor coolant. The applicant notes that NUREG-1801 Rev. 1, Section XI.M11, "Nickel-Alloy Nozzles and Penetrations," does not contain program elements. The staff notes that in NUREG-1801 Rev. 2, Section XI.M11B "Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion in Reactor Coolant Pressure Boundary Components," a guideline for existing requirements has been defined for this aging management program.

Issue:

The staff reviewed program elements one through six of the applicant's program against the acceptance criteria for the corresponding elements as stated in SRP-LR Section A.1.2.3, and has determined that the following information is needed in order to complete its review of the applicants aging management program.

Request:

On June 21, 2011, the NRC published a final rule, NRC-2008-0554, which, in part, established new requirements, under 10 CFR 50.55a(g)(6)(ii)(F), for the inspection of American Society of Mechanical Engineer's Boiler and Pressure Vessel Code (ASME Code) Class 1 nickel-alloy butt welds in the reactor coolant pressure boundary.

The staff requests that the applicant confirms incorporation of the requirements of Title 10 of the *Code of Federal Regulations* 50.55a(g)(6)(ii)(F), which implements ASME Code Case N-770-1, with certain conditions, into the applicant's Nickel-Alloy Management Program.

RAI B.2.36-5

Background:

The applicant's Selective Leaching Inspection is a new program that will be consistent with GALL AMP XI.M33, "Selective Leaching of Materials." The SRP-LR, Revision 2, Section A.1.2.3.10 states that "for new programs, an applicant may need to consider the impact of relevant [operating experience] OE that results from the past implementation of its existing AMPs that are existing programs and the impact of relevant generic [operating experience] OE

on developing the program elements" and that "an applicant should commit to a review of future plant-specific and industry operating experience for new programs to confirm their effectiveness."

In its response to RAI B.2.36-3, dated May 24, 2011, the applicant stated that "The program does not consist of ongoing activities, but will end upon completion of one-time inspections of the sample set of components. Therefore, a future confirmation of program effectiveness is not applicable to the Selective Leaching Inspection. If plant-specific operating experience indicates the potential for selective leaching after program completion, it will be addressed using the Corrective Action Program."

Issue:

Even though the Selective Leaching Inspection is a one-time inspection program, the results of the inspections and industry operating experience should be reviewed to assess the effectiveness of the program at identifying selective leaching prior to loss of component intended function. If any deficiencies are identified, a review should be performed to determine whether the program should be enhanced or a new program should be developed. It is unclear to the staff how operating experience will be incorporated into the Selective Leaching Inspection to confirm the effectiveness of the program.

Request:

State how future plant-specific and industry operating experience related to the Selective Leaching Inspection will be reviewed to confirm the effectiveness of the program, evaluate the need for the program to be enhanced, or indicate a need to develop a new aging management program.

RAI 3.3.2-4

Background:

In its response to RAI 3.3.2-2 dated June 3, 2011, the applicant stated that the copper alloy and copper alloy with greater than 15 percent zinc components (spray nozzles and valve bodies) exposed internally to outdoor air in the fire protection system (LRA Table 3.3.2-14) are sprinkler system components which are normally drained but vented to the outdoor atmosphere. The applicant further stated that these components are not susceptible to loss of material, cracking, or selective leaching because the environment to which they are exposed is not wetted and therefore the components have no aging effects requiring management.

The staff noted that while the sprinkler system internal components are not directly exposed to a wetted environment, they are open to the atmosphere, which contains moisture that can potentially become trapped in the system and cause condensation to accumulate. Normal daily temperature variations can promote the exchange of air from within the system to the atmosphere and vice versa, allowing moisture and contaminants to enter the system.

The GALL Report, Revision 2, Item VII.I.AP-159, states that copper alloy components exposed externally to outdoor air are susceptible to loss of material and recommends GALL AMP XI.M36, "External Surfaces Monitoring," to manage the aging effect. The staff noted that there are no GALL Report recommendations for copper alloy components exposed to condensation, but that a condensation environment can be bounded by a raw water environment. The GALL Report, Revision 2, Item VII.G.AP-159, states that copper alloy fire protection components exposed to raw water are susceptible to loss of material and recommends GALL AMP XI.M27, "Fire Water System," to manage the aging effect. GALL AMP XI.M27 includes flow testing and inspection recommendations for sprinkler system components, including sprinkler heads.

The GALL Report, Section IX.C states that copper alloy with greater than 15 percent zinc components are susceptible to selective leaching and cracking in addition to the aging effects for copper alloy components.

Issue:

It is not clear to the staff why the sprinkler system components exposed to outdoor air are not susceptible to loss of material, cracking, and selective leaching.

Request:

State why the copper alloy components exposed to outdoor air are not susceptible to loss of material and the copper alloy with greater than 15% zinc components are not also susceptible to cracking and selective leaching; or provide an appropriate program to manage the aging effects.

RAI 3.3.2.14-1

Background:

The GALL Reports states that stainless steel components exposed to steam are susceptible to loss of material and stress corrosion cracking. In LRA Table 3.3.2-14, the fire water storage tank heat exchanger contains stainless steel tubes exposed to steam that are being managed for reduction in heat transfer. However, the applicant has not identified loss of material or stress corrosion cracking as applicable aging effects, as discussed in the GALL Report.

Issue:

Even though the heat exchanger tubes license renewal function is heat transfer, both loss of material and stress corrosion cracking could affect the intended function. It is unclear to the staff why the applicant has not included both loss of material and stress corrosion cracking as applicable aging effects.

Request:

Justify why loss of material and stress corrosion cracking are not applicable aging effects for the fire water storage tank heat exchanger tubes exposed to steam. If it is determined that both loss of material and stress corrosion cracking are applicable, provide information on how these aging effects will be managed.

July 27, 2011

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Sincerely,

/RA/

Samuel Cuadrado-De Jesús, Project Manager
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Docket No. 50-346

Enclosure:
As stated

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Letter to Barry S. Allen from Samuel Cuadrado-De Jesús dated July 27, 2011

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