



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

April 5, 2011

Mr. 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 – BATCH 1 (TAC NO. ME4640)

Dear Mr. Allen:

By letter dated August 27, 2010, FirstEnergy Nuclear Operating Company (FENOC), submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54) for renewal of Operating License NPF-3 for the Davis-Besse Nuclear Power Station (DBNPS). 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 requests for additional information are included in the Enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Mr. 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 301-415-2277 or by e-mail at brian.harris2@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Harris", written over a faint circular stamp.

Brian K. Harris, 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.2.1-1

License renewal application (LRA) Section B.2.1 states that this is an existing program that is consistent with the Generic Aging Lessons Learned (GALL) Report aging management program (AMP) XI.S4. Element 5, "detection of aging effects," in GALL AMP XI.S4 recommends for the implementation of periodic in-service examinations for the containment structures by applying the requirements of subsections in ASME Section XI. The associated Subsection IWE-3510.1 of ASME Section XI (1995) Code states, "The general Visual Examination shall be performed by, or under the direction of, a Registered Professional Engineer or other individual, knowledgeable in the requirements for design, in-service inspections, and testing of Class MC and metallic liners of Class CC components."

In Subsection 2.1.2 of Davis-Besse Nuclear Power Station (DBNPS) Surveillance Test Procedure DB-PF-03009, Revision 06, "Containment Vessel and Shielding Building Visual Inspection," states that "Personnel who performed the examination of the exterior surface of the Containment Vessel and the shielding Building need not be qualified in accordance with NOP-CC-5708". It is not clear to the staff what/which procedure(s) is/are used to qualify personnel who perform visual examinations of the Containment Vessel and Shielding Building.

Provide qualifications of the personnel performing the visual examinations of the exterior surface of steel containment, and both sides of the shield building to be consistent with the recommendation in element 5, "detection of aging effects," of GALL AMP XI.S4.

RAI B.2.5-1

Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR) Section A.1.2.3.1 states that the scope of the program should include the specific structures and components of the program that manages the aging. In addition, SRP-LR Section A.1.2.3.4 states that detection of aging effects should occur before there is a loss of the structure and component intended functions. The parameters to be monitored or inspected should be appropriate to ensure that the structure and component intended functions will be adequately maintained for license renewal under all current licensing basis design conditions. This includes aspects such as method or technique (e.g., visual, volumetric, surface inspection), frequency, sample size, data collection and timing of new or one-time inspections to ensure timely detection of aging effects.

LRA AMP B.2.5 does not provide program specific information (e.g., monitoring technique, frequency of inspection, acceptance criteria) discussed and addressed in recent adverse industry operating experience with neutron absorber materials and staff guidance (i.e., NRC Information Notice 2009-26: Degradation Of Neutron-Absorbing Materials in the Spent Fuel Pool, and GALL AMP XI.M40, "Monitoring of Neutron-Absorbing Materials other than Boraflex")

ENCLOSURE

The staff requests the following information:

1. Describe the material specifications (i.e., dimensions, percentage B₄C, etc.) of the Boral material. Also, provide the age, manufacturer of the material and method of fabrication.
2. Describe the surveillance approach that will be used in the cited AMP, specifically the methods and techniques utilized (e.g., visual, weight, volumetric, surface inspection, neutron attenuation testing, frequency, sample size, data collection, timing and acceptance criteria).
3. Describe how the neutron absorption capacity of the material will be monitored. Include a description of the testing, parameters measured, calculations, and acceptance criteria.
4. Discuss whether the Boral material is vented. If not, discuss how it is assured that spent fuel pool water does not leak into the sealed aluminum weld.

RAI B.2.11-1

In element 3, "parameters monitored or inspected," of the basis document LRPD-05, Aging Management Evaluation Results related to LRA AMP B.2.11, the applicant states that the technical basis for the sample selected will be documented. In the GALL AMP XI.E6 Revision 2, it states that the applicant will document the technical basis for the sample selected.

It is not clear to the staff that these statements are consistent because the applicant has not developed the technical basis and/or the criteria for the sample selection.

Provide the technical basis for the sample selection of cable connections for one-time inspection.

RAI B.2.11-2

The staff reviewed USAR A.1.11 supplement description for the program (LRA AMP B.2.11) which states that the one-time inspection uses thermography (augmented by the optional use of contact resistance testing) to detect loose or degraded connections. The staff believes that a one-time inspection is to provide additional confirmation to support industry operating experience that shows electrical cable connections have not experienced a high degree of failures and that existing installation and maintenance practices are effective. The example description for this program is provided in NUREG-1800, Revision 2 (SRP-LR) Table 3.0-1.

The purpose of the one-time inspection is to confirm that either aging of cable connections is not occurring and/or that the existing preventive maintenance program is effective such that a periodic inspection is not required.

Provide an adequate program description consistent with the description provided in SRP-LR Revision 2 Table 3.0-1.

RAI B.2.11-3

In the program basis document LRPD-05, under the parameters monitored or inspected program element, the applicant states that the inspections will include detection of loosened bolted connection due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation. It further states, in part, that the following factors will be considered for sampling: connections type (i.e., bolted splices, bolted terminations, lug terminations, bolted cable terminations). Splices (butt or bolted), crimp-type ring lugs, connectors, and terminal blocks are described as the most common types of connections in the program description of GALL AMP XI.E6 Revision 2.

The NRC staff believes that loosening of cable connections may also occur in different types of connections and may not only be limited to bolted connections.

Provide a technical justification of why only bolted connections are considered in the inspection sample criteria.

RAI B.2.11-4

During a plant walkdown, the staff noted cable bus connections in a terminal housing connecting cable bus, bus tie transformers, and in the 4160 V essential switchgear buses. The applicant indicated to the staff that these cable buses were not subject to aging and are not included in an AMP because they are not located in an adverse localized environment.

The staff agreed with the applicant that insulation material for cable buses and connections are not subject to an AMP. However, metallic material of cable bus connections may experience increased resistance of connection due to loosening of bolted connections caused by repeated thermal cycling of connected loads.

Explain how aging of cable bus connections will be managed during the period of extended operation (PEO).

RAI B.2.20-1

Periodic draining and cleaning of diesel fuel tanks is performed so that internal surfaces can be visually and volumetrically inspected allowing for detection of corrosion and other degradation inside the tanks. Regulatory Guide 1.137 "Fuel Oil Systems for Standby Diesel Generators," Revision 1, Regulatory Position C.2.f, documented in GALL Report Revision 2, recommends draining and cleaning of diesel fuel tank internal surfaces at least once every 10 years during the period of extended operation.

LRA AMP B.2.20, "Fuel Oil Chemistry Program," states that the diesel fire pump day tank (DB-T47) and the station blackout diesel generator day tank (DB-T210) are cleaned and inspected every 12 years. The applicant states that LRA AMP B.2.20 is consistent with GALL AMP XI.M30, "Fuel Oil Chemistry," with exceptions.

The LRA is not consistent with the 10-year draining and cleaning frequency for diesel fuel tanks recommended by the GALL Report. Instead, the LRA states that draining and cleaning of the DB-T47 and DB-T210 tanks are performed on a 12-year interval.

Discuss how the 12-year interval for draining and cleaning of tanks DB-T47 and DB-T210 is consistent with the GALL AMP XI.M30, "Fuel Oil Chemistry." Alternatively, provide a revision to your draining and cleaning frequency such that it is on a 10-year interval.

RAI B.2.20-2

The performance of volumetric inspections on degradation identified by visual inspections of the diesel fuel tank internal surfaces is an acceptable means to verify the presence of corrosion or other degradation inside the tanks. Volumetric inspections are to be performed if evidence of degradation is observed during visual inspections of diesel fuel tank internal surfaces, or if visual inspection is not possible, as recommended in GALL Report Revision 2.

LRA AMP B.2.20 does not explicitly state and it is not clear to the staff whether volumetric inspections of degradation identified by visual inspections of tank internal surfaces will be performed.

If degradation is identified in a diesel fuel tank by visual inspections or if visual inspection is not possible, please discuss whether volumetric inspections will be performed to verify the degradation or inspect tank internal surfaces.

RAI B.2.20-3

The Final Safety Analysis Report (FSAR) Supplement description contained in the SRP-LR provides an acceptable program description for the GALL AMP XI.M30, "Fuel Oil Chemistry," which includes the specific ASTM Standards to be used for monitoring and control of fuel oil contamination to maintain fuel oil quality. LRA A.2.20 "Fuel Oil Chemistry Program" states:

The Fuel Oil Chemistry Program manages the presence of contaminants, such as water or microbiological organisms, that could lead to the onset and propagation of loss of material or cracking (of susceptible material) through proper monitoring and control of fuel oil contamination consistent with plant Technical Specifications and ASTM International (ASTM) standards for fuel oil.

Specifying the ASTM Standards to be used ensures that there is an adequate description of the critical elements of the Fuel Oil Chemistry Aging Management Program to provide assurance that the program will be properly executed during the period of extended operation. LRA FSAR Supplement A.2.20 does not include ASTM standards D975, D2276, D2709, D4057 and D4176 found in element 1, "scope of program," of LRA AMP B.2.20.

Justify the absence of the above mentioned ASTM standards in your FSAR Supplement provided in LRA Appendix A. Alternatively, provide a revision to your FSAR supplement to add the specific ASTM standards.

RAI B.2.21-1

GALL AMP XI.E3, "Inaccessible Medium Voltage Cables not Subject to 10 CFR 50.49 Environmental Qualification Requirements," addresses inaccessible medium voltage cables. The purpose of this program is to provide reasonable assurance that the intended functions of inaccessible medium-voltage cables (2 kV to 35 kV), that are not subject to environmental qualification requirements of 10 CFR 50.49 and are exposed to adverse localized environments caused by moisture while energized, will be maintained consistent with the current licensing basis. The scope of the program applies to inaccessible (in conduits, cable trenches, cable troughs, duct banks, underground vaults or direct buried installations) medium-voltage cables within the scope of license renewal that are subject to significant moisture simultaneously with significant voltage (energized 25% of the time).

The application of AMP XI.E3 to medium-voltage cables was based on the operating experience available at the time Revision 1 of the GALL Report was developed. However, industry operating experience subsequent to GALL Report Revision 1 indicates that the presence of water or moisture can be a contributing factor in inaccessible power cable failures at lower service voltages (400 V to 2 kV). Applicable operating experience was identified in licensee responses to Generic Letter (GL) 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," which included failures of power cable operating at service voltages of less than 2 kV where water was considered a contributing factor. The staff also noted that the significant voltage screening criterion (subject to system voltage for more than energized 25% of the time) was not applicable for all the inaccessible power cable failures noted.

Industry operating experience provided by NRC licensees in response to GL 2007-01 has shown: (a) that there is an increasing trend of cable failures with length in service, and (b) that the presence of water/moisture or submerged conditions appears to be the predominant factor contributing to cable failure. The staff has determined, based on the review of the cable failure data, that an annual inspection of manholes and a cable test frequency of at least every six years (with evaluation of inspection results to determine the need for an increased inspection frequency) is a conservative approach to ensuring the operability of power cables and, therefore, should be considered. The use of test and inspection frequencies in the determination of the need for adjustment of test and inspection frequencies should also be considered.

In addition, industry operating experience subsequent to GALL Report Revision 1 has shown that some NRC licensees may experience cable manhole water intrusion events, such as flooding or heavy rain, that subjects cables within the scope of program for GALL AMP XI.E3 to significant moisture. The staff has determined that event driven inspections of cable manholes, in addition to a 1-year periodic inspection frequency, is a conservative approach and, therefore, should be considered.

The staff requests the following information:

1. Provide a summary of your evaluation of recently identified industry operating experience and any plant-specific operating experience concerning inaccessible low voltage power cable failures within the scope of license renewal (not subject to 10 CFR 50.49 environmental qualification requirements), and how this operating experience applies to the need for additional aging management activities for such cables.
2. Explain how DBNPS will manage the effects of aging on inaccessible low voltage power cables within the scope of license renewal with consideration of recently identified industry operating experience and any plant-specific operating experience. The discussion should include assessment of your aging management program description, program elements (i.e., "scope of program," "preventive actions," "parameters monitored or inspected," "detection of aging effects," "monitoring and trending," and acceptance criteria"), USAR summary description and applicable license renewal commitment to demonstrate reasonable assurance that the intended functions of inaccessible low voltage power cables subject to adverse localized environments will be maintained consistent with the current licensing basis through the PEO.
3. Provide an evaluation showing how the Non-EQ Inaccessible Medium-Voltage Cable Program test and inspection frequencies, including event driven inspections, incorporate recent industry and plant-specific operating experience for both inaccessible low and medium-voltage cable. Explain how the Inaccessible Medium-Voltage Cable Program will ensure that future industry and plant-specific operating experience will be incorporated into the program such that inspection and test frequencies may be increased based on test and inspection results.

RAI B.2.21-2

GALL AMP XI.E3 states that periodic actions are taken to prevent inaccessible cables from being exposed to significant moisture, such as identifying and inspecting in-scope accessible cable conduit ends and cable manholes for water collection, and draining the water, as needed.

Manhole MH3045, based on work orders, corrective actions, system health reports, and staff inspection reports, has continued to experience water intrusion and cable submergence. Corrective actions have included increased inspection frequencies and, more recently, the installation of a temporary sump pump to limit the exposure of in-scope inaccessible cable to significant moisture.

Provide a commitment to implement the corrective actions (such as permanent sump pump, cable replacement, increased inspection frequencies, and testing) for manhole MH3045 to prevent in-scope inaccessible cable from being exposed to significant moisture (cable wetting or submergence) so that these cables will continue to perform their intended functions during the PEO.

RAI B.2.21-3

GALL AMP XI.E3 states that for this AMP, periodic actions are taken to prevent cables from being exposed to significant moisture, such as inspecting for water collection in cable manholes, and draining water as needed.

GALL AMP XI.E3, element 2, states in part that the inspection should include direct observation that cables are not wetted or submerged. The staff is concerned that power plant work orders developed to inspect manholes including manholes in-scope for license renewal do not specifically require documentation if in-scope inaccessible cables are found submerged. Although procedures require inspecting for water level and pumping out any water found, the maintenance work orders do not have an action to identify in-scope cables found submerged. Without this step it is not clear how cables exposed to significant moisture would be identified and how additional corrective actions would be taken. Reference work orders PM 4297, PM 4294, PM 8025, and PM 4296.

Explain how in-scope inaccessible power cables that are exposed to significant moisture will be identified and how corrective actions will be taken through referenced plant work orders.

RAI B.2.21-4

GALL AMP XI.E3 states that for this AMP, periodic actions are taken to prevent cables from being exposed to significant moisture, such as inspecting for water collection in cable manholes, and draining water as needed. The staff reviewed manhole drawings provided by the applicant and noted that some of the manholes in the scope of license renewal do not have sump pumps but drain to manholes that are not in scope that do have sump pumps.

It is not clear to the staff that the sump pumps located in manholes not in scope of AMP B.2.21 but connected through common drainage systems (a common sump for the duct bank system) would be inspected/functionally tested. Because these sump pumps are used to prevent in-scope inaccessible power cables from being exposed to significant moisture, the staff is concerned that sump pumps not located in in-scope manholes may not be inspected/functionally tested under LRA AMP B.2.21.

Explain how sump pumps not included in the in-scope manholes but used to prevent in-scope inaccessible power cables from being exposed to significant moisture are inspected and functionally tested with the associated in-scope manholes under LRA AMP B.2.21.

RAI B.2.21-5

System Health Reports (including 2010-04), and other site documents reference a medium-voltage wetted cable replacement program as part of the health improvement plan. The System Health Reports identify medium-voltage underground cables located in a potentially wet environment that are scheduled for replacement. The System Health Reports state that the priority for cable replacement is based on identified corrective actions and considers the following factors: (1) risk significance, (2) length of time a cable is energized, (3) cable age, (4) insulation type, and (5) connected equipment

GALL AMP XI.E3, element 7, "corrective actions," states that when an unacceptable condition or situation is identified, a determination is made as to whether the same condition or situation is applicable to other accessible or inaccessible, in-scope power cables. Element 7 further states that corrective actions may include, but are not limited to, installation of permanent drainage systems, installation of sump pumps and alarms, more frequent cable testing or manhole inspections, or replacement of the affected cable.

The identification of wetted medium-voltage cable replacement with respect to inaccessible power cables in scope of license renewal (GALL AMP XI.E3) is not specifically referenced or described in the System Health Reports.

Provide a discussion of the medium-voltage wetted cable replacement program as applicable to license renewal. Discuss criteria for replacement including prioritization or deferred replacement with monitoring (testing). Provide information detailing the in-scope inaccessible power cables included in the replacement program, the number of in-scope inaccessible power cables replaced, and the planned schedule for in-scope inaccessible power cable replacement or monitoring (testing).

RAI B.2.22-1

GALL AMP XI.S1, "ASME Section XI, Subsection IWE," element 6, recommends that the areas that are found to be suspect during visual examination require an engineering evaluation or require correction by repair or replacement.

During the AMP audit at DBNPS, the staff interviewed the applicant staff and reviewed documentation about the ground water seepage in different plant structures. The staff found that there is history of ground water infiltration into the annular space between the concrete shield building and steel containment.

During the audit, the staff also reviewed documentation (CR 10-72660) that indicated the presence of standing water in the annulus sand pocket region. The standing water appears to be a recurring issue of ground water leakage and areas of corrosion were observed on the containment vessel. In addition, during the audit the staff reviewed photographs that indicate peeling of clear coat on the containment vessel annulus area, and degradation of the moisture barrier, concrete grout, and sealant in the annulus area that were installed in 2002-2003.

The staff requests the following information:

1. Plans and schedule to perform nondestructive examinations, such as ultrasonic testing (UT) of the steel containment in the sand pocket region including the area below and above the grout.
2. The condition of the drains located in the sand pocket region, and if the water exiting from these drains is monitored.
3. Plans and schedule to remove/replace/repair degraded grout, moisture barrier, and sealant.
4. Corrosion rate in the inaccessible area of the steel containment that can be reasonably inferred from UT examinations or from representative samples in similar operating conditions, materials, and environments.
5. Using the established corrosion rate, demonstrate that the steel containment will have sufficient thickness to perform its intended function through the PEO.

RAI B.2.22-2

GALL AMP XI.S1, "ASME Section XI, Subsection IWE," element 1, states that 10 CFR 50.55a(b)(2)(ix) specifies additional inspection requirements for inaccessible areas. It states that the licensee is to evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas.

During the site audit, the NRC staff reviewed documentation that indicated borated water leakage into the East/West and Incore instrumentation tunnels from the refueling cavity. The borated water leaks from the reactor cavity floor through the construction joint at the base of 4-foot thick East/West tunnel wall (elevation 550'-6"). The borated water has degraded the concrete wall coating, and corroded the conduits, piping, and supports in the East/West tunnel and Incore instrumentation tunnel.

There are approximately 2 feet of concrete between the reactor cavity floor and steel containment. Based on the observed leakage from a 4-foot thick wall, it is likely that borated water has also leaked on the top embedded steel containment and may cause its degradation/corrosion.

Provide details of actions planned to examine the inaccessible portion of the steel containment. Specifically, provide details of any plans to remove concrete at the bottom of normal sump (approximate elevation 536) to expose and inspect steel containment for degradation. In addition, provide details and plans for a study to determine the effect of the loss of thickness in the steel containment due to exposure to borated water over the PEO. The study should also address the potential of borated water flowing on top of the steel containment and leaking through the concrete into the normal sump. The staff needs this information to verify that the

effects of aging on the intended function of the steel containment plate will be adequately managed for the PEO.

RAI B.2.22-3

GALL AMP XI.S1, "ASME Section XI, Subsection IWE," element 10, recommends that steel containment corrosion concerns described in the NRC generic communications should be considered. In addition, GALL AMP XI.S1 states that ASME Section XI, Subsection IWE requires examination of coatings that are intended to prevent corrosion.

It is not clear from the review of the LRA if the applicant's ASME Section XI, IWE AMP requires examination of coatings that are intended to prevent corrosion.

Please clarify if the ASME Section XI, IWE AMP inspects and credits coating on the inside surface of the steel containment for corrosion protection.

RAI B.2.22-4

DBNPS LRA Section 4.6.2 states a search of the DBNPS current licensing basis did not identify any pressurization cycles or fatigue analyses for containment penetration assemblies.

Containment piping penetration sleeves examination is included in the scope of the GALL AMP XI.S1 ASME Section XI, Subsection IWE. In addition, DBNPS steel penetration sleeves, dissimilar metal welds, bellows, and steel components are subject to cyclic loading during plant operation. In absence of a fatigue analysis, these components are required to be monitored for cracking. It is not clear to the staff if steel penetration sleeves, dissimilar metal welds, and steel components are included in the scope of the program and monitored for cracking.

Please clarify if the ASME Section XI, IWE AMP monitors steel penetration sleeves, dissimilar metal welds, bellows, and steel components for cracking due to cyclic loading.

RAI B2.23-1

GALL AMP XI.S3, "ASME Section XI, Subsection IWF," element 5, "monitoring and trending," states that for IWF examinations of component supports, if a component's present condition is discovered to be different from its previous condition identified in prior examination, such changes in condition should be documented in accordance with ASME IWA-6230. The staff reviewed program element 5, "monitoring and trending," of the DBNPS in-service inspection (ISI) program – IWF basis documents and did not identify a reference to ASME IWA-6230 for documenting newly discovered changes in condition.

Provide information on the procedure by which changes in condition are documented in the IWF program in accordance with the provisions of ASME IWA-6230. If changes in condition are not

currently being documented, explain how changes of condition from prior examination will be documented as part of the IVF AMP in accordance with ASME IWA-6230.

RAI B2.25-1

SRP-LR Section A.1.2.3.1 and Table A.1, state that the "scope of program," program element should include the specific structures and components of which the program manages the aging. In LRA B.2.25 the applicant states that the Leak Chase Program will monitor borated water leakage from the spent fuel pool, the fuel transfer pit, and the cask pit stainless steel liners due to age-related degradation. In its "scope of program," program element, the LRA states that the Leak Chase Monitoring Program is credited with detecting loss of material in the liners and further focuses the program on the integrity of the liner welds. In its "operating experience," program element, the LRA reviews the impact the leakage had on the leak chase system (channels, valve bodies, etc.) and on the contiguous concrete structures. It also states that borated water is evidenced in the Auxiliary Building but there are no concerns regarding the strength or integrity of the concrete structure. The same program element discusses monitoring of the tell-tale drains and the effort made to unclog the drains. Finally, LRA Table 3.5.2-2, titled "Aging Management Review Results - Auxiliary Building," identifies three programs to manage the aging effects of the spent fuel pool liner: the PWR Water Chemistry Program, the Davis Besse Tech Specs, and the Leak Chase Program.

It is not clear to the staff the extent of the scope of the Leak Chase Program. LRA Section B.2.25 discusses not only monitoring of borated water leakages but also monitoring and detection of aging effects for the leak chase system, its components, and the associated concrete structures.

Identify the full scope of the program. Does the AMP track only the borated water leakages or does it also expand to manage aging effects for the entire leak chase system, including its materials, components, and structures exposed to borated water? If the program includes components of the leak chase system, where in the AMR Results Tables does the applicant address the management of aging effects for the wall/floor channels, tubes, trenches, and valve casings?

RAI B2.25-2

SRP-LR Section A.1.2.3.3 and Table A.1-1, state that the "parameters monitored or inspected," program element recommends the identified parameters to be linked to the degradation of the particular structures and components intended function(s). For a condition monitoring program, the parameters monitored or inspected should detect the presence and extent of aging effects which according to the GALL Report and SRP-LR are loss of material due to pitting and crevice corrosion and cracking due to SCC of the spent fuel pool, the fuel transfer pit, and the cask pit stainless steel liners.

In LRA B.2.25 "parameters monitored or inspected," program element, the applicant states that the program monitors the amounts and rate of leakage accumulated in the leak chase system

and collected from each of the zone valves. In Table 3.5.2-2 of the LRA, titled "Aging Management Review Results - Auxiliary Building," the applicant further states that weekly, it also monitors the spent fuel pool water, per DBNPS Tech Specs, Section 3.7.14, titled "Spent Fuel Pool Water Level."

The LRA "parameters monitored or inspected," program element states that it only monitors the amount of borated water leakage through the tell-tale drains linked to the zone valves. There is no discussion of the weekly surveillance of the water level in spent fuel pool and how that is correlated to the collected leakage. There is also no discussion of water evaporation during the lengthy monthly accumulations of borated water in the leak chase system which could lead to increasingly acidic water that could accelerate the aging effects on channels, tubes, trenches, valve bodies, etc and faulty readings in boron concentrations. It is not clear to the staff what kind/type of materials make up the leak chase drainage system, how these are impacted by the acidic leakage, and how the applicant tracks the variation in the acidity of the borated water. It is also not clear to the staff what additional parameters the applicant monitors for this degradation so that the leak chase drainage system will continue to perform adequately during the PEO.

The staff requests the following information:

1. Identify the material used (e.g., carbon steel, A36) for each of the following: leak chase channels, collector tubes, zone drains, leak trenches, and for any other component (other than the liners) that the leak chase system uses for drainage of borated water.
2. How does the applicant relate the leakage of the borated water to observed degradations, if any, of the leak chase system materials and components (liners, liner weldments, channels, tubes, trenches, valve bodies, etc.) and to the level of water in the spent fuel pool?
3. In addition to the monitoring of the boron concentration in the leakage and the water level in the spent fuel pool, does the applicant monitor the concentration of any other elements (e.g., Fe) or the acidity (i.e., pH) of the collected leakage or additional parameters that could be related to aging effects of the leak chase system and its components? If other parameters are measured, discuss the acceptance criteria for each measured parameter.

RAI B2.25-3

SRP-LR Section A.1.2.3.4 and Table A.1-1, in "detection of aging effects," program element state that detection of aging effects should occur before there is a loss of structure or a component's intended function(s). The program element should address aspects such as method or technique (i.e., visual, volumetric, surface inspection), frequency, sample size, data collection used and the timing of new/one-time inspections to ensure timely detection of aging effects. Aging effects/mechanisms to detect, according to SRP-LR and the GALL Report, are loss of material and SCC. Timing for the detection of aging effects is based on plant-specific or industry-wide operating experience.

In LRA B.2.25, the applicant states in the "scope of program," program element that the program is credited for detection of loss of material in the liners, while in its "detection of aging effects," program element it states the detection is done on a monthly basis by recording the amount of accumulated borated water in the zone drain valves of the spent fuel pool, the fuel transfer pit, and the cask pit liners. Monthly collected leakages from any valve in excess of 10 milliliters are labeled, further analyzed for boron content, and the results documented in the work order system. The LRA also states that this type of monitoring supports early determination and localization of leakages. In LRA Table 3.5.2-2, titled "Aging Management Review Results - Auxiliary Building," it further states that there are three programs in place set to manage the aging effects of the spent fuel pool liner: the PWR Water Chemistry Program, the DBNPS Tech Specs, and the Leak Chase Program.

It is not clear to the staff, how the applicant correlates the monthly collected information of the borated water leakage and its analysis to the weekly Tech Specs surveillance of the spent fuel pool water level. The LRA does not state how this information collectively provides timely detection and localization of leakages in the leak chase system and its associated components and structures, including cracking due to SCC and loss of material due to pitting and crevice corrosion. It is also not clear to the staff if the applicant uses any additional detection techniques capable of identifying the continued functionality of the system during the PEO.

The staff requests the following information:

1. Elaborate on how the Tech Specs and Leak Chase Program can collectively identify detection for loss of material and SCC aging effects in the liners and leak chase system.
2. Since condition monitoring programs are based on either visual or volumetric inspections, what detection method(s) (e.g., boroscopes, fiber optics, etc.), other than monitoring the amount of the leaked borated water, does the applicant employ to ascertain the integrity and functionality of the leak chase channels (i.e., these remain unclogged and intact, devoid of rust and accumulated boric acid) during the PEO?

RAI B2.25-4

SRP LR Section A.1.2.3.5 and Table A.1-1, in "monitoring and trending," program element state that the element should provide predictability of the extent of degradation allowing timely response for corrective or mitigative actions and that aging indicators quantitative or qualitative, should be quantified, to the extent possible, to allow trending. The SRP-LR and the GALL Report, also state that monitoring should be done both for the spent fuel pool water level according to the plant Tech Specs and the level of fluid in the leak chase channels. In LRA B.2.25, the applicant stated in the "monitoring and trending," program element that the Leak Chase Monitoring Program routinely monitors the leak chase valves. A leak rate then is calculated based on the recorded monthly leakage. When the collected leakage from any drain valve exceeds 10 milliliters, then the sample is analyzed for boron concentration. The recorded data is reviewed by the spent fuel pool system engineer. Adverse conditions are documented in the Corrective Action Program and summarized in System Health Reports.

In a letter dated July 31, 2006, to the "Industry Groundwater Protection Initiative Questionnaire," FENOC states that monitoring in its Beaver Valley Station is performed daily, while in the Perry Nuclear Power Plant it is done weekly. It is not clear to the staff how the monthly leakage monitoring activities at DBNPS could be compared and trended to the industry standards and the weekly plant-specific requirements of the spent fuel pool water level surveillance. It is also not clear to the staff how the applicant would trend a degrading or compromising liner environment and/or leak chase drainage system. Finally, the LRA does not state how the monthly activities of leakage collection, analysis, and recording could provide a timely prediction of the extent of liner degradation or forward trending of anticipated leakages from the spent fuel pool which is a Class I structure.

The staff requests the following information:

1. Justify the basis for selecting monthly checking of leakages at DBNPS.
2. Explain how monthly monitoring provides adequate information for trending leakage rates and boron concentrations to predict the integrity of the leak chase system including the liner of the Class I structure.

RAI B2.25-5

SRP LR Section A.1.2.3.6 and Table A.1-1 state that the acceptance criteria of the program and their basis, according to the referenced "acceptance criteria" program element, should be described so that the need for corrective actions is evaluated. Acceptance criteria should be specific and quantifiable to ensure that the structures and components' intended function(s) remain under all CLB design conditions during the PEO. The program should include a methodology for analyzing the results against applicable acceptance criteria.

In LRA B.2.25 the "acceptance criteria," program element states that adverse trends are documented in the Corrective Action Program. The LRA also states that adverse trends are those with continued increases of leak rates on a particular zone valve.

Although the SRP-LR guidance recommends sound quantitative or qualitative acceptance criteria for the periodic inspections, the LRA in its "acceptance criteria," program element does not indicate what specific numerical values of increasing leak rates would be considered to trigger the need for corrective actions. The acceptance criteria are neither specific nor quantifiable but rather subjective depending on the review of the collected data by the responsible system engineer. It is also not clear to the staff what constitutes "abnormal" data. Nor does the applicant state what kind of methodology it uses to analyze such results against industry applicable acceptance criteria. The acceptance criteria should provide for timely corrective action before loss of intended function(s), thus meeting the criteria set under CLB.

The staff requests the following information:

1. Is there a threshold of an unacceptable/adverse increase in leakage rates of borated water that would constitute the basis to trigger corrective actions? What would the corrective actions be?
2. Is there a drain zone that is permitted to have more leakage than others?

RAI B2.25-6

SRP-LR Revision 2, Tables 3.0-1 and 3.5-2 state that plant-specific AMPs should contain information associated with the bases for determining that aging effects, in this case loss of material and SCC in stainless steel liners, will be managed during the PEO. LRA Appendix A, titled "Updated Final Safety Analysis Report," in paragraph A.1.25, titled "Leak Chase Monitoring Program," states that the program is a periodic condition monitoring program focusing on observations and activities for early detection of leakage from the spent fuel pool, the fuel transfer pit, and the cask pit liners due to age-related degradation.

There is no description in the Updated Final Safety Analysis Report (UFSAR) of what aging effects the program manages. The program also does not state or give a brief description of its activities.

Identify the aging effects being managed and summarize the activities involved.

RAI B.2.26-1

The staff noted that water contamination in lubricating oil can cause an environment that is conducive to loss of material or reduction of heat transfer. In addition, areas of stagnant oil flow are susceptible to water accumulation and have the potential to go undetected with the current standard industry testing techniques.

GALL AMP XI.M39 "Lubricating Oil Analysis," states that water and particle concentration should not exceed limits based on equipment manufacturer's recommendations or industry standards. Additionally, it states that phase-separated water in any amount is not acceptable. The staff noted during its audit that LRA Section B.2.26 and the applicant's program basis document does not indicate that any testing is performed to detect the presence of phase-separated water, nor do they provide any corrective actions that will be taken if phase-separated water is detected.

Describe the tests that will be performed to detect for the presence of phase-separated water in lubricating oil systems within the scope of license renewal. If testing for phase-separated water will not be performed, clarify and provide technical justification for the preventative actions taken in order to prevent phase-separated water accumulation from occurring. Conversely, if preventative actions are not to be taken to prevent phase-separated water accumulation, provide technical justification for why no action is needed.

RAI B.2.27-1

GALL AMP XI.S5 element 6, "acceptance criteria," states that corrective actions should be taken if the extent of cracking or steel degradation is sufficient to invalidate the evaluation basis.

The applicant's Masonry Wall Inspection procedures do not provide guidance or acceptance criteria for what level of degradation leads to a reevaluation of the existing evaluation basis.

Describe the acceptance criteria that are used to trigger corrective actions, including reevaluating the existing evaluation basis. Provide technical justification for the adequacy of the acceptance criteria.

RAI B.2.38-1

The staff has identified potential inconsistencies between NEI 97-06, Revision 2, and the standard steam generator technical specifications which the applicant has adopted (through its adoption of TSTF-449). These inconsistencies were discussed in a public meeting on September 16, 2009, between the Nuclear Energy Institute Steam Generator Task Force and the U.S. Nuclear Regulatory Commission (refer to meeting summary dated October 6, 2009 (Agencywide Documents Access and Management Systems Accession Number ML092820119)).

The potential inconsistencies between NEI 97-06, Revision 2, and the standard steam generator technical specifications raises questions on whether all the applicant's technical specification requirements will be satisfied.

Please confirm that your steam generator AMP has addressed the potential inconsistencies between NEI 97-06 and your technical specifications.

RAI B2.39-1

A review of program basis documentation related to program element 10, "operating experience," noted that during Maintenance Rule Evaluation of Structures Inspections boric acid deposits had been observed over a large surface area of the Containment Incore Instrumentation Tunnel walls and the under-vessel area that are indicative of refueling canal leakage. This included numerous boric acid indications on the concrete and on structural members below the elevation of the refueling cavity. It was also noted that the leakage was coming through the reinforced concrete construction joints and shrinkage cracks, running down the wall to the floor, and in some places under the grating in the tunnel.

It is unclear to the staff that the effects of refueling cavity leakage on the containment internal concrete structures have been adequately addressed and that the possible aging effects will be properly managed during the PEO.

The staff requests the following information:

1. Provide background information and/or data to demonstrate that the concrete and embedded steel reinforcement potentially exposed to the prior borated water leakage has not been degraded. If experimental results will be used as part of the assessment, provide evidence that the test program is representative of the materials and conditions that exist.
2. Discuss any remedial actions or repairs that are planned to address refueling cavity leakage and when they will be implemented. In the absence of a commitment to stop the refueling cavity leakage, explain how the structures monitoring program, or other plant-specific program, will address the refueling cavity leakage to ensure that resulting aging effects, especially in any inaccessible areas, will be effectively managed during the PEO.

RAI B2.39-2

A review of program basis documentation related to program element 10, "operating experience," noted that during Maintenance Rule Evaluation of Structures inspections, water had been noted to leak from the Spent Fuel Pool and travel through the surrounding concrete. The leakage has been active periodically into the ECCS pump room #1. Indications of cracking and staining on the underside of the Spent Fuel Pool and Transfer Pit (ceiling of Room 109) were also observed during a plant walkdown.

Investigation and evaluation of the periodic spent fuel pool leak indicated that six of the twenty-one leak chase channels were blocked. The leak chase channels were un-clogged releasing a significant amount of trapped fluid in several of the blocked leak chase channels. After un-clogging, the leak collection isolation valves were cleaned. Since that time, leak detection activities have been performed monthly with intermittent small quantities of fluid having been captured from several leak chase channels. Recent results indicate that two of the leak chases drains are exhibiting continual small leakage. It is unclear to the staff that the concrete and steel reinforcement of the spent fuel pool have not been impacted by the borated water.

The staff requests the following information:

1. Provide historical data on the leakage occurrence and volume, and available results from chemical analysis performed on the leakage.
2. Provide the root cause analysis that was performed to identify the source of leakage, including information on the path of the leakage and structures that could potentially be affected by the presence of the borated water. If the analysis indicates that the current leakage is completely contained within the leak chase channels, provide a technical justification for this assumption and explain how it will continue to be validated during the period of extended operation.

3. Provide background information and data to demonstrate that concrete and embedded steel reinforcement potentially exposed to the borated water have not been degraded. If experimental results will be used as part of the assessment, provide evidence that the test program is representative of the materials and conditions that exist. If a concrete sampling program (e.g., obtaining cores in region affected) will not be implemented, please explain why this is not feasible or not necessary.
4. Discuss any remedial actions or repairs that are planned to address concrete cracking such as observed on the underside of the spent fuel pool and when they will be implemented. In the absence of a commitment to repair the concrete cracking prior to the PEO, explain how the structures monitoring program, or other plant-specific program, will address the concrete cracking to ensure that aging effects, especially in any inaccessible areas, will be effectively managed during the PEO.

RAI B2.39-3

The GALL Report notes that for plants with aggressive ground water/soil (pH < 5.5, chlorides > 500 ppm, and sulfates > 1500 ppm) and/or where the concrete structural elements have experienced degradation, a plant-specific AMP accounting for the extent of degradation experienced should be implemented to manage concrete aging during the PEO. In Revision 1 of the GALL Report, this recommendation is provided in item T-05, while in Revision 2 it is captured in the guidance for GALL AMP XI.S6, "Structures Monitoring," and XI.S7, "Inspection of Water-Control Structures."

Program element 3, "parameters monitored or inspected," of the DBNPS Structures Monitoring Program basis document notes that the chemical parameters for DBNPS groundwater are considered to be aggressive (i.e., chlorides = 2780 ppm (max) and sulfates = 1700 ppm (max)). Program element 10, "operating experience," notes that the Turbine Building has active water in-leakage and evidence of water in-leakage was observed in several locations in the floor and walls of the Turbine Building by the NRC audit team during the plant walkdown. Also, program basis documentation has identified groundwater intrusion into ECCS Pump Room and ECCS cooler, the East Condenser Pit through various joints and seams in the east wall below the condensate storage tank, efflorescence in the south and east exterior walls of Room 121 of the Auxiliary Building, and the annulus sand pocket. Indications of in-leakage of ground water were also observed at an overhead joint in the service water tunnel during a plant walkdown.

LRA Section B.2.39 states that the DBNPS Structures Monitoring Program will be enhanced to require the responsible engineer to review the raw water chemistry for unusual trends during the PEO, raw water chemistry will be collected at least once every five years with data collection staggered to account for seasonal variations, and monitoring of below-grade inaccessible concrete components will be implemented before the PEO. However, it is unclear to the staff that inaccessible concrete components have not been adversely impacted by the aggressive ground water and when an examination of an inaccessible concrete component will be conducted.

The staff requests the following information:

1. Provide background information and data to demonstrate that the concrete and steel reinforcement subjected to aggressive groundwater is not degrading. If an inspection of an effected inaccessible concrete component will be conducted prior to the PEO, provide details about the inspection, including the proposed schedule and how the inspection will demonstrate the acceptability of effected concrete throughout the plant. If a concrete sampling program (e.g., obtaining cores in an affected region) will not be implemented, explain why this is not feasible or not necessary.
2. Explain how the structures monitoring program, or other plant-specific program, will address aggressive groundwater infiltration to ensure that resulting aging effects, especially in any inaccessible areas, will be effectively managed during the PEO

RAI B2.39-4

GALL AMP XI.S6, "Structures Monitoring Program," element 4, notes that inspector qualifications are to be commensurate with industry codes, standards, and guidelines. ACI 349.3R-96 and ANSI/ASCE 11-90 are identified as providing an acceptable basis for addressing inspector qualifications.

Program element 4, "detection of aging effects," of the DBNPS Structures Monitoring Program notes that the structures are periodically monitored to identify degradation that could impair the functional performance of the structure. Visual inspection is the method used for monitoring the structural degradation. The inspections are performed by Maintenance Rule Walkdown Teams consisting of at least two individuals that are degreed engineers, or equivalent, and have at least five years experience in civil/structural engineering activities, or as determined by the Mechanical/Structural supervisor. At least one member of the Maintenance Rule Walkdown Team is a licensed Professional Engineer. It is unclear to the staff that personnel performing the inspections are commensurate with industry codes, standards, and guidelines for inspectors.

Provide qualifications of the personnel performing the structural inspections and show that they are commensurate with industry codes, standards, and guidelines (e.g., Section 7 of ACI 349.3R).

RAI B2.39-5

Based on recent operating experience and recent NRC reviews, the staff has determined that structures within the scope of license renewal should be monitored on a frequency not to exceed five years. This current staff position is captured in GALL Report Revision 2, AMPs XI.S5 "Masonry Walls," and XI.S6, "Structures Monitoring Program."

Program element 4, "detection of aging effects," of the DBNPS Structures Monitoring and Masonry Wall Programs note the programs periodically monitor the structures through visual

inspections to identify degradation that could impair the functional performance of the structure. The standard interval between periodic assessments for a particular structure is four years, but the frequency can vary between two and ten years depending on the location and environment, susceptibility to degradation, and the age of the structure. It is unclear to the staff that the inspection frequency meets the requirements of the GALL Report.

Identify the structures and masonry walls that will be inspected on a frequency greater than five years, along with their environments and a summary of past degradation. Include a technical justification for the longer interval.

RAI B2.39-6

Based on recent operating experience and recent NRC reviews, the staff has determined that inspection programs for structures within the scope of license renewal should include quantitative limits for characterizing degradation. Chapter 5 of ACI 349.3R provides adequate acceptance criteria for concrete structures. Applicants that are not committed to ACI 349.3R and/or elect to use plant-specific criteria for concrete structures should describe the criteria and provide a technical basis for deviations from those in ACI 349.3R.

The applicant's inspection criteria used to assess the condition of structures and structural components are found in Maintenance Rule evaluation procedure for the Maintenance Rule Evaluation of Structures. Evaluation criteria follow guidance contained in NEI 96-03. Plant basis documentation identifies acceptance criteria as: Y (structure/area/room acceptable, no design basis violation, housekeeping may or may not be required), W (structure/area/room acceptable with deficiencies), and N (structure/area/room unacceptable). Little in the way of quantitative inspection criteria are provided and at least one example of criteria provided does not meet ACI 349.3R requirements (i.e., crack widths < 0.0625 in. as acceptable whereas ACI lists crack widths < 0.015 in. as acceptable). It is unclear to the staff what quantitative acceptance criteria are used and that acceptance criteria utilized comply with design basis codes and standards such as ACI 349.3R.

The staff requests the following information:

1. Provide the quantitative acceptance criteria for the Structures Monitoring and the Water-Control Structures Inspection Programs. If the concrete acceptance criteria deviate from those discussed in ACI 349.3R, provide technical justification for the differences.
2. If quantitative acceptance criteria will be added to the programs as an enhancement, provide plans and a schedule to conduct a baseline inspection with the quantitative acceptance criteria prior to the PEO.

RAI B2.39-7

During a field walkdown with the applicant's technical personnel on February 15, 2011, the NRC staff noted indications of spall repairs in two areas located on the NW side of the Shield Building near the upper right corner of the former reactor vessel head entry cut out.

This observation led to discussions relative to inspection procedures and criteria that were utilized for the Shield Building. It is unclear to the staff how inspections are performed to identify degradation such as the noted repair locations. It is also unclear how inspections of the Shield Building will be performed during the PEO and how the inspections will be used to manage aging.

Explain how aging management will be accomplished for the shield building during the PEO. Explain which AMP will be credited for aging management and why it is appropriate for the Shield Building. If visual inspections are credited, explain how the concrete will be inspected (e.g., optical aids, scaling technologies, etc., for difficult to access areas such as upper exterior elevations).

RAI B.2.39-8

NRC staff review has determined that if ASTM A325, ASTM F1852, and/or ASTM A490 bolts are used, the preventative actions as discussed in Section 2 of the Research Council for Structural Connections, "Specification for Structural Joints Using ASTM A325 or A490 Bolts," should be followed. This recommendation is now captured in structural AMPs XI.S1, XI.S3, XI.S6, and XI.S7 of the GALL Report Revision 2.

The staff reviewed the structural AMPs in LRA Sections B.2.22, B.2.23, B.2.39, and B.2.40, as well as the associated support documents, and found no discussion of the preventative actions recommended in "Specification for Structural Joints Using ASTM A325 or A490 Bolts."

If ASTM A325, ASTM F1852, and/or ASTM A490 bolts are used, explain how the preventative actions discussed in Section 2 of "Specification for Structural Joints Using ASTM A325 or A490 Bolts" are addressed, or why they are unnecessary. The response should address all structural bolting within the scope of license renewal.

RAI B2.40-1

A review of program basis documentation related to program element 10, "operating experience," noted that during Preventive Maintenance inspections in 2007 it was discovered that the north embankment of the safety-related portion of the intake canal had settled. This settlement reduced the slope of the embankment.

It is unclear to the staff that the degradation of the embankment has been adequately addressed and that the possible aging effects will be properly managed during the PEO.

Explain how the integrity of the embankment is being ensured and how related aging effects will be addressed during the PEO.

RAI 3.6-1

In LRA Table 3.6-1, item 3.6.1-09, metal enclosed bus – enclosure assemblies, the applicant stated that loss of material due to general corrosion is not applicable to DBNPS because there is no metal enclosed bus within the scope of license renewal. During a plant walkdown, the staff reviewed the station blackout recovery path and noted that cable buses are used to connect bus tie transformers and the 4160 V essential switchgear buses. The applicant indicated to the staff that these cable buses were not subject to an AMP because they are not located in an adverse localized environment. The staff agreed with the applicant that these cable buses are not required to have an AMP because GALL Report (NUREG-1801, Revision 2) Section VI does not recommend aging management for cable in air indoor or outdoor environment. However, the cable buses are protected by enclosure assemblies. These assemblies are made from galvanized steel material.

Galvanized steel material in air outdoor or air indoor uncontrolled environment could be subject to loss of material due to general, pitting, and crevice corrosion.

Explain how aging of cable bus enclosure assemblies (including support structures) will be managed during the PEO.

RAI 3.6-2

In LRA Section 3.6.2.2.2, the applicant stated that industry experience has shown that transmission conductors do not normally swing unless subjected to a substantial wind, and they stop swinging shortly after the wind subsides. The applicant further stated that wind loading that can result in conductor sway is considered in the transmission system design. The applicant then concluded that loss of material due to mechanical wear is not an aging effect requiring management for the high voltage insulators and transmission conductors at DBNPS.

SRP Section 3.6.2.2 2 states that loss of material due to mechanical wear caused by wind blowing on transmission conductors could occur in high-voltage insulators. The applicant did not address plant-specific operating experience with high-voltage insulator and transmission conductor loss of material due to wear.

Review plant-specific operating experience and provide justification to confirm that wear has not occurred in high-voltage insulators and transmission conductors installed at DBNPS.

RAI 3.6-3

In LRA Section 3.6.2.2.3, the applicant stated that galvanized and aluminum bolted connections are exposed to the same service conditions as the plant switchyard and do not experience any

aging effects, except for minor oxidation of the exterior surfaces, which does not impact their ability to perform their intended function.

Aluminum and galvanized connections are highly conductive but do not make a good contact surface since aluminum and galvanized steel exposed to air forms oxides on the inside surface which is nonconductive and could increase the resistance of connections. SRP (NUREG-1800, Revision 2) Section 3.6.2.2.3 states that increased resistance of connection due to oxidation in transmission conductors and connections, and switchyard bus and connections could occur. The SRP recommends a plant-specific program for management of increase resistance due to oxidation for transmission conductor and switchyard bus connections.

Explain why increase resistance of connections (galvanized and aluminum bolted connections) is not an aging effect requiring management and why an AMP is not needed.

RAI XI.S8-1

The GALL Report states that proper maintenance of protective coatings inside containment (defined as Service Level I in Nuclear Regulatory Commission Regulatory Guide [RG] 1.54, Revision 1) is essential to ensure operability of post-accident safety systems that rely on water recycled through the containment sump/drain system. Degradation of coatings can lead to clogging of strainers, which reduces flow through the sump/drain system.

The DBNPS LRA does not credit the protective coating monitoring and maintenance program for aging management. Although the licensee does not credit the program for aging management, there needs to be adequate assurance that there is proper management and maintenance of the protective coatings in containment, such that they will not degrade and become a debris source that may challenge the Emergency Core Cooling System and Containment Spray System performance.

The staff requests the following information:

1. Discuss why XI.S8, "Protective Coating Monitoring and Maintenance Program," is not credited for aging management.
2. Discuss in detail whether DBNPS has a coatings monitoring and maintenance program. Describe the program if one is used.
3. Describe how DBNPS will ensure that there will be proper maintenance of the protective coatings inside containment such that they will not become a debris source that could impact the operability of post-accident safety systems that rely on water recycled through the containment sump or drain system in the PEO.

If a program is used, describe the frequency and scope of the inspections, acceptance criteria, standards used, and the qualification of personnel who perform containment coatings inspections.

April 5, 2011

Mr. 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 – BATCH 1 (TAC NO. ME4640)

Dear Mr. Allen:

By letter dated August 27, 2010, FirstEnergy Nuclear Operating Company (FENOC), submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54) for renewal of Operating License NPF-3 for the Davis-Besse Nuclear Power Station (DBNPS). 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 requests for additional information are included in the Enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Mr. 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 301-415-2277 or by e-mail at brian.harris2@nrc.gov.

Sincerely,
/RA/
Brian K. Harris, 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

DISTRIBUTION:
See next page

ADAMS Accession No. ML110820490

OFFICE:	LA:DLR	PM:RPB1:DLR	BC:RPB1:DLR	PM:RPB1:DLR
NAME:	YEdmonds	BHarris	BPham	BHarris
DATE:	04/04/2011	04/05/2011	04/05/2011	04/05/2011

OFFICIAL RECORD COPY

Letter to Barry S. Allen from Brian K. Harris dated April 5, 2011

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
DAVIS-BESSE NUCLEAR POWER STATION – BATCH 1 (TAC NO. ME4640)

HARD COPY:

DLR RF

E-MAIL:

PUBLIC

RidsNrrDlr Resource

RidsNrrDlrRpb1 Resource

RidsNrrDlrRpb2 Resource

RidsNrrDlrRarb Resource

RidsNrrDlrRapb Resource

RidsNrrDlrRasb Resource

RidsNrrDlrRerb Resource

RidsNrrDlrRpob Resource

PCooper

BHarris

DWrona

EMiller

MMahoney

ICouret, OPA

TReilly, OCA

BHarris, OGC

VMitlyng, RII

JCameron, RIII