Phyllis

From: Clark, Phyllis
Sent: Thursday, January 26, 2017 5:42 AM
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Subject: RE: WATERFORD STEAM ELECTRIC STATION, UNIT 3, LICENSE RENEWAL APPLICATION – RAI SET 12 (CAC NO. MF7492)
Attachments: Waterford 3 LRA Final RAI Set 12.docx

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

Mr. Michael R. Chisum
Site Vice President
Entergy Operations, Inc.

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE WATERFORD STEAM ELECTRIC STATION, UNIT 3, LICENSE RENEWAL APPLICATION – SET 12 (CAC NO. MF7492)

Dear Mr. Chisum:

By letter dated March 23, 2016, Entergy Operations, Inc. submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew the operating license NPF-38 for Waterford Steam Electric Station, Unit 3. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing the information contained in the license renewal application and has identified areas where additional information is needed to complete the review.

The enclosed requests for additional information were discussed with Ms. Leia Milster 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 at 301-415-6447 or by e-mail at Phyllis.Clark@nrc.gov.

Sincerely,

Phyllis Clark

Phyllis Clark, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure:
As stated

cc: Listserv

ADAMS Accession No.: **ML17018A359** ***via email**

OFFICE	PM:RPB1:DLR	BC:RPRB:DLR	BC:RASB:DLR	Acting BC:RPB1:DLR	PM:RPB1:DLR
NAME	PClark	DMorey*	BWittick*	RChazell*	PClark
DATE	12/22/2016	12/21/2016	12/15/2016	1/25/2017	1/25/2017

WATERFORD STEAM ELECTRIC STATION, UNIT 3

LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION – SET 12
(CAC NO. MF7492)

RAI B.1.36-1a

Background:

The initial response to RAI B.1.36-1 did not provide sufficient bases to establish that flow blockage for the wet cooling tower (WCT) distribution nozzles does not need to be managed in the auxiliary component cooling water (ACC) system.

Issue:

1. LRA Table 2.3.3-3 lists "nozzle" as a component type in the ACC system but only includes "pressure boundary" as the intended function. The design basis document for this system (W3-DBD-4, Section 3.2.2.2) identifies these WCT components as "spray nozzles," indicating that they may have additional intended functions.

2. The RAI response states that flow restriction may be an issue for spray nozzles, but states this is not considered an age-related effect and flow blockage is not an aging effect requiring management for the WCT distribution nozzles. The staff notes that biofouling of the component cooling water heat exchanger was previously identified in LER 382/1994-004, demonstrating that fouling within the ACC system has occurred. In addition, the ACC design basis document DBD-4, Section 3.2.2.2.F identifies that the original Munters spray nozzles were changed to the current Bete fog nozzles sometime afterwards. It is unclear to the staff whether the spray nozzle change was related to past operating experience issues associated with fouling or blockage.

Request:

1. Clarify the intended functions of the nozzles in the WCT. Specifically address whether these nozzles have an intended function associated with "flow control" or "flow distribution" (as defined in LRA Table 2.0-1, "Component Intended Functions…"). If an intended function different than that stated in the LRA is identified, appropriately update the LRA and discuss how any aging effects that can adversely affect the intended function will be managed. If the intended function is only "pressure boundary," provide details from the design basis information to show that the current licensing basis heat transfer will be met assuming straight flow out of the associated piping (i.e., no credit for spray or flow distribution).

2. If flow blockage will not be managed for the spray nozzles, provide additional information regarding the absence of nozzle fouling or blockage from recent inspection results.

    a. address the potential for different results in the future, since aging effects for the galvanized coating on the WCT distribution piping (per FSAR Table 9.2-8) are not being managed (per WF3-ME-14-00030) and consequently may not effectively limit internal corrosion like it has in the past.

b. provide sufficient details (isometric drawings or equivalent sketches) for the WCT distribution piping to show that all piping segments will appropriately drain, such that internal corrosion, which could promote flow blockage (similar to that discussed in Information Notice 2013-06) is not likely.

c. address the periodic wetting and drying aspect to show that accelerated corrosion (similar to that discussed in SRP-LR Section 3.2.2.2.5) is not likely.

d. explain why the original Munters spray nozzles were changed to the current Bete fog nozzles (per W3-DBD-4, Section 3.2.2.2.F) and if this change is related to past operating experience issues associated with fouling or blockage.

RAI B.1.36-2a

Background:

The response to RAI B.1.36-2 states that the siphon-breaker holes in the nonsafety-related chemical addition and filtration (CA&F) system were appropriately excluded from the scope of license renewal. The response credits basin level indications and alarms to alert the plant staff, allowing them to take corrective actions to address a failure in the CA&F system that was siphoning water out of the safety-related wet cooling tower (WCT) basins. The staff notes that during some design basis events, WCT basin levels will (by design) drop below the basin alarm levels, and basin level indications will show decreasing values due to evaporation, etc. (per water requirements in UFSAR Table 9.2-10). Consequently, the plant staff would not be aware that a failure in CA&F system was siphoning water out of the basins in all circumstances.

Issue:

The staff considers that the functional separation/isolation of the nonsafety-related CA&F system relies on the passive function of the siphon-breaker holes. In addition, it is unclear to the staff why other components in the CA&F system that are either within or above the WCT basin can be excluded from the scope of license renewal.

Request:

1. For all of the CA&F components that are either within or above the WCT basin, provide information to show that their failure due to aging effects cannot prevent satisfactory accomplishment of an ACC intended function. Specifically address the flex hoses between the piping and the suction manifolds and any supports or attachments that stabilize any of the CA&F components. Alternatively, include the portions of the CA&F system within the scope of license renewal and update the LRA (including demonstration that the effects of aging will be adequately managed so that the intended functions will be maintained).
2. For the siphon-breaker holes in the CA&F suction piping, provide design basis documentation showing that a failure of the CA&F system could not prevent satisfactory accomplishment of an intended function for the ACCW system. Alternatively, include the siphon-breaker holes of the CA&F system within the scope of license renewal and update the LRA (including demonstration that the effects of aging will be adequately managed so that the intended functions will be maintained).

RAI B.1.36-6a

Background:

The response to RAI B.1.36-6 states that WF3-EP-14-00010, (AMRS report) reconciles and summarizes the results from WF3-ME-14-00009 (system AMR report for component cooling and auxiliary component cooling) and the WF-ME-00030 (topical AMR report for coatings). The response concludes that AMR items in LRA Table 3.3.2-3 are consistent with the relevant basis documents.

The AMR Summary report Section 1.2 states:

> "*The AMRR results are unchanged [emphasis added] in the AMRS with the following possible exceptions.*
>
> *Minor editorial changes, with no effect on the results, may be made to assure consistent use of terminology and report format. For example, words abbreviated in the AMRR may be spelled out, capitalization may be changed and in some cases the order of results presentation may be revised for consistency.*
>
> *For AMRRs developed as topical reports, such as AMRR for corrosion under insulation, the AMRR results will be incorporated into the AMRS tables in a manner that best presents the information. For example, lines from the topical report AMRR may be added to the individual system tables in the AMRS [emphasis added].*

Issue:

The AMR Summary report does not reflect the statements in the RAI response "the AMRS report reconciles [emphasis added] and summarizes the results" of the system AMR reports and the topical AMR reports. Although lines from the topical AMR report may be added to the system tables in the AMRS, (thus explaining why additional items may appear in the AMR summary tables), an explanation for the lines that have been deleted from the system AMR tables in the AMR summary tables is not provided in the basis documentation. The deletion of lines from the system AMR tables is inconsistent with the statement in the AMR Summary report that "the AMRR results are unchanged in the AMRS…"

Request:

Provide an explanation for why line items have been deleted from the tables in WF3-ME-14-00009, "Aging Management Review of the Component Cooling and Auxiliary Component Cooling Water Systems," as discussed in the initial request and explain how, if not updated, the relevant basis documentation will meet the record retention requirements of 10 CFR 54.37(a).

RAI 3.5.1.74-1a

Background:

Section 54.21(a)(3) of Title 10 of the Code of Federal Regulations (10 CFR) requires applicants to demonstrate that the effects of aging for systems, structures, and components (SSCs) within the scope of license renewal and subject to an aging management review (AMR) pursuant to 10 CFR 54.21(a)(1) will be adequately managed so that intended function(s) will be maintained consistent with the current licensing basis (CLB) for the period of extended operation. The SRP-LR states that the identification of applicable aging effects based on materials, environment, and operating experience should be provided in the license renewal application (LRA) to demonstrate that the requirements of 10 CFR 54.21(a)(3) are met. The LRA Table 2 AMR items provide the detailed identification of AMRs.

In its response to RAI 3.5.1.74-1, provided by letter dated December 7, 2016, the applicant stated that Waterford 3 has not identified Lubrite® sliding surfaces that are applicable to SRP-LR AMR item 3.5.1-74, but did state that "Waterford 3 does have Lubrite® plates associated with the reactor coolant system [RCS] that are addressed in LRA Table 3.5.1, [i]tem 75."

LRA Table 3.5.1, AMR item 3.5.1-75 states, in part, that "[l]oss of material which could cause loss of mechanical function is addressed under [i]tem 3.5.1-77 related to component support members." LRA Table 3.5.1, AMR item 3.5.1-77 states that the Structures Monitoring Program manages the listed aging effects.

Issue:

The staff notes that for SRP-LR AMR item 3.5.1-75 the Generic Aging Lessons Learned (GALL) Report recommends GALL Report aging management program (AMP) XI.S3, "ASME Section XI, Subsection IWF," to manage the potential aging effects of Class 1, 2, and 3 sliding support surfaces made of Lubrite®; graphitic tool steel, fluorogold, and lubrofluor. GALL Report AMP XI.S3 contains recommendations that are not included in the Structures Monitoring Program. Examples of GALL Report AMP XI.S3 recommendations include, but are not limited to, the following:

- GALL Report AMP XI.S3 states that the American Society of Mechanical Engineers (ASME) Code requires that a sample of ASME Class 1, 2, and 3 piping supports and supports other than piping supports (Class 1, 2, 3, and metal containment) that are not exempt from examination be examined as specified in Table IWF-2500-1, "Examination Categories."
- GALL Report AMP XI.S3 includes acceptance criteria for sliding surfaces that identifies arc strikes, weld spatter, paint, scoring, roughness, or general corrosion on sliding surfaces as unacceptable conditions.
- The "corrective actions" program element states that identification of unacceptable conditions triggers an expansion of the inspection scope, in accordance with IWF-2430, and reexamination of the supports requiring corrective actions during the next inspection period, in accordance with IWF-2420(b). In accordance with IWF-3122, supports containing unacceptable conditions are evaluated or tested or corrected before returning to service.

The staff notes that the applicant's Structures Monitoring Program does not include several of the above and other GALL Report recommendations for age management of the identified RCS supports with Lubrite® sliding surfaces. In addition, the staff notes that there are no LRA Table 2 AMR items identifying Lubrite® as a material for sliding surfaces of component supports that would be subject to AMR. Based on its review of the applicant's response, the LRA Structures Monitoring Program, and LRA AMR tables, it is not clear whether the Lubrite® plates

in the RCS are component supports applicable to the GALL Report AMP XI.S3 recommendations and, if so, whether the Structures Monitoring Program will incorporate the recommendations of GALL Report AMP XI.S3 for these components. In addition it is not clear how the criteria in 10 CFR 54.21(a)(3) and SRP-LR is being met absent the identification of Lubrite® as a material subject to AMR in the LRA Table 2 AMR items.

Request:

1. State whether the Lubrite® plates are ASME Code Class 1, 2, and/or 3 supports and, if so, state how the aging effects will be managed under the Structure Monitoring Program consistent with the above recommendations from the GALL Report AMP XI.S3. Provide a technical basis if recommendations from GALL Report AMP XI.S3 will not be addressed by the Structures Monitoring Program to manage the aging effects of these components.
2. For those components with Lubrite® plates for which the aging effects will be managed, state how the criteria of 10 CFR 54.21(a)(3) will be met without identifying Lubrite® as a material in the Table 2 AMR items.

RAI B.1.1-3a

Background:

Section 54.21(a)(3) of Title 10 of the Code of Federal Regulations (10 CFR) requires applicants to demonstrate that the effects of aging for systems, structures, and components (SSCs) within the scope of license renewal and subject to an aging management review (AMR) pursuant to 10 CFR 54.21(a)(1) will be adequately managed so that intended function(s) will be maintained consistent with the current licensing basis (CLB) for the period of extended operation.

The "detection of aging effects" program element of GALL Report AMP XI.M18 recommends periodic visual inspections (at least once per refueling cycle) of closure bolting for signs of leakage to ensure the detection of age-related degradation due to loss of material and loss of preload. Periodic inspection of pressure boundary components for signs of leakage ensures that age-related degradation of closure bolting is detected and corrected before component leakage becomes excessive. The staff noted that it is difficult to visually detect leakage of clear gaseous fluids and the GALL Report AMP XI.M18 does not provide specific guidance for the detection of leakage of clear gaseous fluids from a bolted connection. Therefore, by letter dated November 15, 2016, the staff issued RAI B.1.1-3 requesting that the applicant state how signs of leakage of clear gaseous fluids will be detected from bolted closures included in the Bolting Integrity Program in order to ensure the detection of loss of material and loss of preload before there is a loss of intended function. In its response to RAI B.1.1-3, provided by letter dated December 15, 2016, the applicant stated, in part, that:

> [e]ffectively, bolted closures on fluid-containing systems would represent a sample of the overall bolted closure population, including bolted closures in gas-filled systems. […] [P]ersonnel can identify leakage from bolted closures through visual and audible indications. Visual indications can include residue on nearby components and, in the case of steam systems, a visible plume or condensation in the area of the leak. Audible indications that could indicate a leak are the sounds of leaking gaseous contents escaping from the system. In addition, system engineers review operations logs, deficiency lists, and system parameters such as pressure, flow, and temperature which could indicate a system leak. Based on these activities and considerations, signs of leakage of clear gaseous fluids are detected from bolted closures included in the Bolting Integrity Program, and ensure that the detection of loss of material and loss of preload occur before there is a loss of intended function.

Issue:

The LRA states that the applicant's Bolting Integrity Program is consistent with GALL Report AMP XI.M18. The staff notes that the GALL Report AMP XI.M18 is not a sampling-based program and that the program relies on periodic inspections of all closure bolts within the scope of license renewal. From the applicant's statement that "fluid-containing systems would represent a sample of the overall bolted closure population, including bolted closures in gas-filled systems," it is not clear whether the applicant plans to use closure bolt degradation in fluid-filled systems as a leading indicator for degradation of closure bolting for gas-filled systems, and potentially not inspect all closure bolting as recommended by the GALL Report.

The staff notes that for systems with gaseous fluids such as air it is unlikely that a leakage could be identified through a visual inspection and that it is also unlikely that such leakage may leave residue on nearby components that would be identifiable by a visual inspection. The staff also notes that although identification of leakage is possible through audible indications this method may not be effective for systems in areas where there is a high level of noise and also due to common requirements for the use of ear protection in those areas. Furthermore it is not clear

whether all systems with gaseous fluids are subject to a review of operations logs, deficiency lists, and parameters such as pressure, flow, and temperature which could indicate a system leak. Therefore for each system with air it is not clear what method or combination of methods applies and how such method(s) would be effective to identify air leakage and ensure the detection of loss of material and loss of preload before there is a loss of intended function.

Requests:

1. State whether the inspections of closure bolts under the Bolting Integrity Program will include all closure bolts in-scope of the program or if only a sample will be inspected. If an exception is taken to the GALL Report AMP XI.M18 recommendation that all in-scope closure bolting be inspected for signs of leakage to indicate loss of material and loss of preload, provide the technical basis to demonstrate that the program will adequately ensure the detection of age-related degradation before there is a loss of intended function.
2. List those systems in-scope of license renewal that contain gaseous fluids for which aging effects will be managed by the Bolting Integrity Program. For each of the systems listed state how signs of leakage of clear gaseous fluids will be detected on associated closure bolting in order to ensure the detection of age-related degradation due to loss of material and loss of preload before there is a loss of intended function.