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NL-17-069

June 8, 2017

U.S. Nuclear Regulatory Commission
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SUBJECT: Reply to Requests for Additional Information for the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application RAI SET 2017-05 (CAC Nos. MD5407 and MD5408)
Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

REFERENCES: 1) NRC letter dated April 28, 2017, "Requests for Additional Information for the Review of the Indian Point License Renewal Application RAI SET 2017-04 (CAC Nos. MD5407 and MD5408)," (ML17110A133)

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. (Entergy) is providing in Attachment 1, the additional information requested by the U.S. Nuclear Regulatory Commission (NRC) pertaining to the review of the License Renewal Application (LRA) for Indian Point Energy Center (IPEC) Unit Nos. 2 and 3 (Reference 1).

Revised LRA Table 3.3.2-17-IP3 is provided in Attachment 2. Revised LRA Table 3.3.2-19-44-IP2 is provided in Attachment 3.

If you have any questions, or require additional information, please contact Mr. Robert Walpole at 914-254-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 8, 2017.

Sincerely,

AJV/gd

A128
NRR

Attachments:

1. Reply to NRC Request for Additional Information Regarding the License Renewal Application
2. Revised LRA Table 3.3.2-17-IP3
3. Revised LRA Table 3.3.2-19-44-IP2

cc: Mr. Daniel H. Dorman, Regional Administrator, NRC Region I
Mr. Sherwin E. Turk, NRC Office of General Counsel, Special Counsel
Mr. William Burton, NRC Senior Project Manager, Division of License Renewal
Mr. Richard V. Guzman, NRR Senior Project Manager
Ms. Bridget Frymire, New York State Department of Public Service
Mr. John B. Rhodes, President and CEO NYSERDA
NRC Resident Inspector's Office

ATTACHMENT 1

to NL-17-069

**REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE
LICENSE RENEWAL APPLICATION**

**ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3
DOCKET NOS. 50-247 AND 50-286**

RAI 3.3.2-17-IP3-1

Background

Section 54.21(a)(3) of Title 10 of the Code of Federal Regulations (10 CFR) requires the applicant to demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation. As described in SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant.

As amended by letter dated December 15, 2016, LRA Table 3.3.2-17-IP3 states that fiberglass city water piping exposed to soil has no aging effect and no recommended aging management program.

The subject letter also describes the change to Table 3.3.2-17-IP3 as: “[p]ermanently repaired pipe (line #1033) with a pressure retaining clamp and using CSI Pipe Wrap-Ply material (carbon fiber) applied on the exterior circumference of the pipe and clamp.”

Issue

1. It is unclear to the staff, based on conflicting information provided above, if the line item represented in LRA Table 3.3.2-17-IP3 is fiberglass piping or is carbon fiber applied on the exterior circumference of the pipe.
2. The “parameters monitored or inspected” program element of GALL Report AMP XI.M41, “Buried and Underground Piping and Tanks,” as modified by LR-ISG-2015-01, “Changes to Buried and Underground Piping and Tank Recommendations,” recommends visual inspections of the external surface condition of polymeric materials to detect (a) loss of material due to wear; and (b) cracking, blistering, and change in color due to water absorption.

Request

1. Clarify if the line item represented in LRA Table 3.3.2-17-IP3 is fiberglass piping or is carbon fiber applied on the exterior circumference of the pipe.
2. State the basis for why (a) loss of material due to wear; and (b) cracking, blistering, and change in color due to water absorption are not aging effects requiring management for polymeric materials exposed to soil.

Response

1. The line item included in LRA Table 3.3.2-17-IP3 as fiberglass piping by Letter NL-16-138, dated December 15, 2016, is carbon fiber reinforced epoxy applied on the exterior circumference of a pressure retaining clamp and the pipe encapsulating both the clamp and a short section of the pipe. Conservatively, the carbon fiber wrap is designed to carry full structural load around the repaired area of the underlying pipe.

2. The pressure retaining clamp discussed in response to Request 1 restricts exposure of the interior surface of the carbon fiber reinforced epoxy from process fluid. Thus, only the external surface of the carbon fiber reinforced epoxy is exposed to an environment that could produce potential aging effects.

As indicated in LR-ISG-2015-01, loss of material due to wear can occur in polymeric components buried in soil containing deleterious materials; however, the backfill placed around the carbon fiber wrap repair consists of clean sand without deleterious material that could cause wear. In addition, LR-ISG-2015-01 describes that there is reasonable assurance that changes in material properties of polymeric materials will not occur as a result of contact with typical soil environments. The Parameters Monitored or Inspected element of the Buried and Underground Piping and Tanks program described in LR-ISG-2015-01 discusses cracking, blistering, and change in color due to water absorption, but these effects are limited to high-density polyethylene (HDPE) and fiberglass components and are not expected in the carbon fiber wrap.

As a result, no aging effects on the carbon fiber reinforced epoxy are expected through the period of extended operation.

LRA Table 3.3.2-17-IP3 is revised to indicate the subject piping is carbon fiber reinforced epoxy. See Attachment 2.

RAI 3.3.2-19-44-IP2-1

Background

Section 54.21(a)(3) of 10 CFR requires the applicant to demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation. As described in SRP-LR, an applicant may demonstrate compliance with 10 CFR 54.21(a)(3) by referencing the GALL Report and when evaluation of the matter in the GALL Report applies to the plant.

As amended by letter dated December 15, 2016, LRA Table 3.3.2-19-44-IP2 states that plastic chlorination system piping and valves exposed externally to indoor air and internally to treated water have no aging effects and no recommended aging management programs.

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," is referenced as a technical basis document in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR). The GALL Report lists generic aging management reviews (AMRs) of systems, structures, and components (SSCs) that may be in the scope of license renewal applications (LRAs). The GALL Report provides little differentiation among generic terms such as plastic for mechanical systems. Therefore, NRC issued the Regulatory Issue Summary (RIS) 2012-02 dated January 24, 2012, "Insights into Recent License Renewal Application Consistency with the Generic Aging Lessons Learned Report." This document provides guidance to the industry in regard to further information recommended in license renewal applications. In regard to plastic materials, the RIS recommends that

applicants provide further information in a plant-specific note because the term "plastic" is not sufficient to evaluate potential aging effects. The RIS states:

"The plant-specific note should state the actual material type or grade (e.g., polyvinyl chloride (PVC), fiberglass-reinforced vinyl ester) and identify environmental considerations that are not obvious from the LRA, FSAR, or license renewal drawings, such as exposure to ultraviolet light, ozone, high temperatures, chemicals, or radiation. The staff requires this information because susceptibility to aging varies widely with the specific material type and environment."

An applicant should ensure that the appropriate material type details are included in the LRA when it states that no Aging Effects Requiring Management or AMP is applicable for plastic components.

Issue

For the plastic piping and valves in the chlorination system, the staff does not have sufficient information on the specific type of plastic and the indoor air and treated water environments to evaluate whether the appropriate aging effects have been identified.

Request

1. State the specific type of plastic material used for the chlorination system piping and valves.
2. State the degree to which the external surfaces of the subject piping might be exposed to ultraviolet light, ozone, high temperatures, chemicals, and radiation.
3. State the chlorine concentration and type of chlorine to which the piping will be exposed.
4. If the above environmental factors are present, state the basis for why the piping is not subject to aging effects requiring management.

Response

1. The specific type of plastic pipe used is chlorinated polyvinyl chloride (CPVC).
2. Much of the CPVC piping is installed beneath floor grating and along walls of the intake structure shielding it from significant sources of ultraviolet light such as sunlight or fluorescent lighting. However, sections of the piping are exposed to sunlight at times during the day.

No abnormal levels of ozone are expected beyond normal atmospheric levels.

The highest temperature expected for the CPVC piping is normal outdoor temperature. The piping is not in close proximity to any heat source.

The CPVC piping carries sodium hypochlorite. The piping is not exposed to other chemicals.

The CPVC piping is not exposed to radiation above normal background levels.

3. A solution of 15% commercial grade sodium hypochlorite is used in the chlorination system.
4. Although no significant source of ultraviolet light such as sunlight or fluorescent lighting are present, aging effects are conservatively applied as a result of the sections of CPVC piping exposed to sunlight for periods of time during the day.

The subject CPVC piping is designed for 100°F and outside design temperature is 93°F dry bulb . Consequently, there are no aging effects requiring management due to elevated temperatures.

CPVC is an acceptable piping material for exposure to sodium hypochlorite . There are no aging effects requiring management due to chemicals.

The CPVC piping is not exposed to a radiation source that could contribute to aging effects requiring management.

CPVC is not affected by ozone. Consequently, there are no aging effects requiring management due to ozone.

LRA Table 3.3.2-19-44-IP2 is revised. See Attachment 3.

ATTACHMENT 2

to NL-17-069

REVISED LRA TABLE 3.3.2-17-IP3

Changes are shown as strikethroughs for deletions and underlines for additions

**ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3
DOCKET NOS. 50-247 AND 50-286**

**Table 3.3.2-17-IP3
 City Water
 Summary of Aging Management Review**

Table 3.3.2-17-IP3: City Water								
Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	Pressure boundary	Fiberglass <u>Carbon fiber reinforced epoxy</u>	Soil (ext)	None	None	--	--	F

ATTACHMENT 3

to NL-17-069

REVISED LRA TABLE 3.3.2-19-44-IP2

Changes are shown as strikethroughs for deletions and underlines for additions

**ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3
DOCKET NOS. 50-247 AND 50-286**

**Table 3.3.2-19-44-IP2
 Chlorination System
 Nonsafety-Related Components Potentially Affecting Safety Functions
 Summary of Aging Management Review**

Table 3.3.2-19-44-IP2: Chlorination System								
Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	Pressure boundary	Plastic	Air—indoor (ext) Air – outdoor (ext)	None <u>Change in material properties</u>	None <u>External Surfaces Monitoring</u>	-	-	- <u>F. 321</u>
Piping	Pressure boundary	Plastic	Treated water (int)	None	None	-	-	- <u>F. 321</u>
Valve body	Pressure boundary	Plastic	Air—indoor (ext) Air – outdoor (ext)	None <u>Change in material properties</u>	None <u>External Surfaces Monitoring</u>	-	-	- <u>F. 321</u>
Valve body	Pressure boundary	Plastic	Treated water (int)	None	None	-	-	- <u>F. 321</u>

Plant-Specific Notes

321. Component is located in the intake structure and manufactured from chlorinated polyvinyl chloride (CPVC).