

IPRenewal NPEmails

From: Kimberly Green
Sent: Monday, May 12, 2008 12:15 PM
To: STROUD, MICHAEL D; dyner@entergy.com
Cc: Bo Pham; Roy Mathew; Duc Nguyen; Rajender Auluck
Subject: Draft RAI on Submerged Cable
Attachments: RAIs from EEEB 05-12-08.doc

Mike and Donna,

Attached is the draft RAI on submerged cables. Please look over and let me know if you require a telephone conference. The purpose of the telephone conference will be to obtain clarification on the staff's request.

Thanks,

Kimberly Green
Safety PM
(301) 415-1627
kimberly.green@nrc.gov

Hearing Identifier: IndianPointUnits2and3NonPublic_EX
Email Number: 79

Mail Envelope Properties (Kimberly.Green@nrc.gov20080512121500)

Subject: Draft RAI on Submerged Cable
Sent Date: 5/12/2008 12:15:25 PM
Received Date: 5/12/2008 12:15:00 PM
From: Kimberly Green

Created By: Kimberly.Green@nrc.gov

Recipients:

"Bo Pham" <Bo.Pham@nrc.gov>
Tracking Status: None
"Roy Mathew" <Roy.Mathew@nrc.gov>
Tracking Status: None
"Duc Nguyen" <Duc.Nguyen@nrc.gov>
Tracking Status: None
"Rajender Auluck" <Rajender.Auluck@nrc.gov>
Tracking Status: None
"STROUD, MICHAEL D" <MSTROUD@entergy.com>
Tracking Status: None
"dtyner@entergy.com" <dtyner@entergy.com>
Tracking Status: None

Post Office:

Files	Size	Date & Time
MESSAGE	382	5/12/2008 12:15:00 PM
RAIs from EEEB 05-12-08.doc	35834	

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

**INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3
LICENSE RENEWAL APPLICATION
DRAFT REQUEST FOR ADDITIONAL INFORMATION (D-RAI)
SUBMERGED CABLES**

D-RAI 3.6.2.3-1

In LRA Table 3.6.2-1, the applicant states that 138kV direct burial insulated transmission cables (passive electrical for station blackout (SBO) recovery) have no aging effects requiring management and indicates (by Note J) for material, environment, aging effect, and aging management program (AMP) that neither the component nor the material and environment combination is evaluated in the GALL Report for meeting the component's electrical intended function. The plant-specific Note 602 for this item in LRA Table 3.6.2-1 states that it is not subject to water treeing, since it is designed for continuously wet conditions. Industry and plant operating experience has not provided any information on failures of this type of cable. In addition, in response to the audit team's question concerning the qualification of this cable for continuous submerged condition, the applicant stated that the aging effects caused by moisture and voltage stress are not applicable to this cable because the lead sheath prevents moisture intrusion, but did not provide any technical justification.

Based on an initial review of the licensee's responses to Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," the staff notes that several licensees have identified failures of XLPE cables in low and medium voltage applications. The high voltage cables could have the same failure mechanisms if the underground cables are susceptible to moisture, water, and condensation environment or have manufacturing defects or damage caused by shipping and installation, or exposure to electrical transients and abnormal operating conditions. The likelihood of failure from any of these causes increases over time as the cable insulation degrades.

10 CFR 54.21(a)(3) requires that components within the scope of license renewal and subject to an AMR must be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation. Therefore, the staff requests the applicant to provide technical justification of why an aging management program is not required to manage the potential loss of dielectric strength leading to reduced insulation resistance and electrical failure due to aging mechanisms such as moisture intrusion, water treeing, elevated operating temperature, voltage stress, and galvanic corrosion. In order to complete its review, the staff requires responses to the following requests for additional information.

1. Explain why an AMP is not required to manage the potential loss of dielectric strength leading to reduced insulation resistance and electrical failure due to aging mechanisms such as moisture and water intrusion, water treeing, elevated operating temperature, voltage stress, galvanic corrosion, manufacturing defects, and potential damage caused by shipping and installation.

2. Describe any testing that was performed on the cable during receipt and post-installation (include the type of testing that was performed on the cable). Describe the capabilities of the testing method performed on the cable. Describe the testing results, and state if the testing identified any problems. State whether a current testing or maintenance program exists for this cable system, and if so, describe that program.

3. Provide details of the original cable specifications including procurement specification (include all applicable references) to support that the subject cable is comparable to submarine cable and/or that the cable is supplied with a moisture barrier or water sealant swelling material applied under the lead sheath as specified in your letter dated October 11, 2007, in response to the LRA audit team's question. Also, describe in detail the differences between the subject cable and a submarine cable.
4. Provide documentation showing that the cable can operate for the duration of the period of extended operation in submerged and wet conditions. If no periodic testing is proposed for this cable, explain how you plan to monitor the degradation of the cable or the condition of the conductor insulation (loss of dielectric strength) to preclude any potential cable failure such that the cable will perform its intended function for the period of extended operation as required by 10 CFR 54.21(a)(3).
5. Describe the AEIC or other specification that is applicable to the IP2/IP3 lead sheath power cables that are designed to be installed in wet environments for extended periods. Also, describe the conditions for which the cable was tested in accordance with specification AEIC CS7 with respect to operability in wet/submerged/humid conditions.
6. Identify the material, environment, aging mechanism, and aging effect for the pot assembly (termination ends) for this cable. Identify details of periodic visual inspections and walkdowns performed to date or planned for the period of extended operation to monitor for oil leakage and check pothead bolt torque, oil testing performed or any indications or alarms provided in the control room to indicate the potential loss of oil. Explain how you will manage the aging effect (loss of dielectric strength) during the period of extended operation.