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

September 3, 2013

Vice President, Operations
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3, LICENSE RENEWAL APPLICATION, SET 2013-05 (TAC NOS. MD5407 AND MD5408)

Dear Sir or Madam:

By letter dated April 23, 2007, as supplemented by letters dated May 3, 2007, and June 21, 2007, Entergy Nuclear Operations, Inc. (Entergy), submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff documented its findings in the Safety Evaluation Report (SER) related to the license renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3, which was issued in August 2009 and supplemented in August 2011 (SER Supplement 1).

By letter dated July 24, 2013, Entergy responded to RAI 3.0.3.1.2-4. The staff has reviewed the response and has identified the need for additional information, which is enclosed.

This RAI was discussed with Mr. Roger Waters, and a mutually agreeable date for Entergy's response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-1627, or by e-mail at Kimberly.Green@nrc.gov.

Sincerely,

Kimberly Green, Sr. Mechanical Engineer
Aging Management of Plant Systems Branch
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosure:
As stated

cc: w/encl

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Docket Nos. 50-247 and 50-286

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As stated

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3, LICENSE RENEWAL APPLICATION, SET 2013-05 (TAC NOS. MD5407 AND MD5408)

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REQUESTS FOR ADDITIONAL INFORMATION, SET 2013-03
RELATED TO INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3
LICENSE RENEWAL APPLICATION
DOCKET NOS. 50-247 AND 50-286

FOLLOW-UP REQUEST REGARDING JULY 24, 3013 RESPONSE ON
CATHODIC PROTECTION

RAI 3.0.3.1.2-4a

Background:

The response to RAI 3.0.3.1.2-4 dated July 24, 2013 stated the following in relation to crediting the cathodic protection (CP) system:

- "[t]he IPEC CP systems will not be credited as preventive measures for the in-scope buried piping."
- "[t]o the extent they are proven effective, the CP systems at IPEC will be considered in risk ranking to ensure that the in-scope buried piping systems that are more susceptible to external corrosion continue to receive a higher risk ranking when determining inspection priority."
- "[t]herefore, no revision to License Renewal Application Sections A.2.1.5 and A.3.1.5 is necessary because Entergy is not crediting the CP system as a preventive measure for in-scope buried piping."

The response to RAI 3.0.3.1.2-4 further stated the following in regard to using the 100mV polarization criterion to demonstrate effectiveness of CP system performance:

- "[f]or existing CP systems, corrosion monitoring probes may be installed near pipe depth to ensure that the pipe of concern is being adequately protected given the possible presence of mixed metal potentials."
- "[t]he failure to meet the 100 mV polarization criterion (which is not uncommon in dry, high-resistance soils) during a new CP system commissioning would prompt further investigation. For example, in that circumstance, corrosion coupons or corrosion probes can be used to confirm the low corrosivity of the in situ soils, such that CP and compliance with the NACE SP0169 CP system effectiveness criteria are not necessary."

Issue:

The staff understands that the CP system will not be credited as a preventive measure for in-scope buried piping. The staff's evaluation of the acceptability of the Buried Piping and Tanks Inspection Program without crediting CP is documented in Safety Evaluation Report Section 3.0.3.1.2. However, the CP system is being credited in regard to risk ranking inspection locations. As such, the program should reflect the purpose of the CP system and its acceptance criteria (e.g., annual testing to confirm 85 percent availability, 80 percent effectiveness, a polarization potential of at least 850 mV instant-off, and upper voltage acceptance criterion of 1200 mV instant-off) that will be used when risk ranking inspection locations. Also, the updated Final Safety Analysis Report (UFSAR) Supplement should reflect the purpose of the CP system.

ENCLOSURE

While the staff recognizes that buried coupons, electrical resistance probes, or placement of reference cells can be used as effective means to detect corrosion rates or localized effectiveness of CP when using the 100 mV polarization criterion in a mixed metal environment, the program does not state details such as what industry consensus document(s) will be used to install the devices, device placement, coupon characteristics, analysis of device results (e.g., how pitting rates versus general corrosion rates will be differentiated), how acceptance criteria will be established, and how many inspections of buried pipe will occur during the time period when the CP effectiveness is indeterminate.

Request:

1. Revise the Buried Piping and Tanks Inspection Program to include the purpose of the CP system and acceptance criteria that will be used when risk ranking inspection locations.

2. Revise the Buried Piping and Tanks Inspection Program UFSAR Supplement to reflect the purpose of the CP system.

3. If the 100 mV polarization criterion will be used in a mixed metal environment, respond to the following:

   a. State which industry consensus documents will be used to install and use the corrosion rate monitoring devices or reference electrodes.

   b. State the acceptance criteria for general and pitting corrosion rates when using electrical resistance probes or coupons.

   c. State how many inspections of buried pipe will occur during the time period when the CP effectiveness is indeterminate.

   d. If coupons will be used, respond to questions i through iii.

      i. Describe the corrosion coupon characteristics, including:
         - the type of coupon to be used (e.g., free-corrosion coupon, polarized and native coupon pair, gravimetric, electrical resistance probe);
         - whether the coupons will be coated with an intentionally embedded holiday;
         - the surface condition (e.g., presence of scale and corrosion products, surface finish) of coupons; and
         - the composition of the coupon compared to the pipe (e.g., chemical composition and microstructure).

      ii. Describe the coupon placement, including:
         - how coupon locations will be selected so that they will be representative of the CP conditions at the point of interest;
         - the number of coupons that will be buried for each linear length of buried pipe;
         - coupon size and orientation with respect to the pipe, for example, how close both in distance and elevation the coupons will be installed to the pipe; and whether coupon will be perpendicular or parallel with the pipe;
         - the length of time coupons will be allowed to be buried;

- how many years the coupons will be buried prior to accepting results;
- for a given portion of pipe, how will the impact of localized soil parameters, such as soil resistivity, soil chemistry, moisture content, temperature and microbiological activity, be considered;
- how voids in the backfill will be avoided when installing coupons; and
- how seasonal variability will be accounted for on soil characteristics.

iii. Describe the analysis of coupon results, including:

- what guidance will be used regarding coupon cleaning, corrosion rate calculations, and data reporting; and
- how pitting rates versus general corrosion rates will be differentiated.