

IPRenewal NPEmails

From: Green, Kimberly
Sent: Wednesday, August 14, 2013 4:36 PM
To: Waters, Roger M. (rwater1@entergy.com)
Cc: Holston, William; IPRenewal NPEmails
Subject: Draft Follow-Up RAI on Cathodic Protection
Attachments: IP Follow-up RAI CP acceptance criteria and purpose 08 13 13 Holston.docx

Roger,

As mentioned in the telephone conference call yesterday, the staff has a follow-up RAI regarding your previous response to the RAI on cathodic protection. Attached is the draft RAI. Please review and let me know if Entergy needs to have a phone call for clarification. As a reminder, Bill Holston and I will be out of the office next week on travel, so if a call is needed, we can try to have one this week, or it will have to wait until the week of August 26.

Kim

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Subject: Draft Follow-Up RAI on Cathodic Protection
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From: Green, Kimberly

Created By: Kimberly.Green@nrc.gov

Recipients:

"Holston, William" <William.Holston@nrc.gov>
Tracking Status: None
"IPRenewal NPEmails" <IPRenewal.NPEmails@nrc.gov>
Tracking Status: None
"Waters, Roger M. (rwater1@entergy.com)" <rwater1@entergy.com>
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D-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 cathodic protection 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 SER 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 UFSAR Supplement should reflect the purpose of the CP system.

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 cathodic protection 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 cathodic protection 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 cathodic protection 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.