From:	Wu, Angela
To:	Paul Aitken; Tony Banks; Eric A Blocher
Subject:	Surry SLRA - Draft 3rd Round RAI - Selective Leaching (TRP 33)
Date:	Thursday, September 19, 2019 2:34:00 PM
Attachments:	033 - Selective Leaching 2nd RAI- Gardner WCH comments.docx

Hello Tony,

Please see attached the draft 3rd round RAI for TRP 33 – Selective Leaching for next Tuesday's clarification call.

Thanks!
Angela

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SURRY TRP 033 Selective Leaching RAI - Gardner

Regulatory Basis

10 CFR 54.21(a)(3) requires an 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. One of the findings that the staff must make to issue a renewed license (10 CFR 54.29(a)) is that actions have been identified and have been or will be taken with respect to managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under 10 CFR 54.21, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis. In order to complete its review and enable making a finding under 10 CFR 54.29(a), the staff requires additional information in regard to the matters described below.

RAI B2.1.21-1a

Background:

GALL-SLR Report AMP XI.M33, “Selective Leaching,” recommends that the external surfaces of buried components may be excluded for the scope of the program if they are externally coated in accordance with Table XI.M41-1, “Preventive Actions for Buried and Underground Piping and Tanks,” of GALL-SLR Report AMP XI.M41, “Buried and Underground Piping and Tanks,” and where direct visual examinations of buried piping in the scope of license renewal have not revealed any coating damage.

SLRA Section B2.1.21, “Selective Leaching,” states that external surfaces of buried components that are coated consistent with GALL-SLR Report AMP XI.M41, “Buried and Underground Piping and Tanks,” may be excluded from the sample population.

During its audit (ADAMS Accession No. ML19128A079), the staff made the following observations related to external corrosion and coating degradation of buried piping:

- The staff reviewed Condition Report (CR) 006624 and noted that buried auxiliary feedwater piping was found to be leaking in 2004 and that the cause of the degradation was lack of a protective wrap on the affected line.
- The staff reviewed CR 105973 and noted that during inspection of buried piping, several pipelines associated with the containment spray and chemical volume and control systems indicated coating failure where the felt wrap had separated from the coal tar coating.
- The staff reviewed CR 386494 and noted that during an excavation to support guided wave examinations, areas of pitting were identified on the exterior surfaces of the pipe. The lowest remaining wall thickness was 0.122 inches compared to a nominal pipe thickness of 0.245 inches.
- The staff reviewed CR 441171 and noted that a 1 inch diameter through wall hole was identified on a buried fire protection line. It is unclear to the staff if this through wall hole was due to internal or external corrosion.
- The staff reviewed CR 497540 and noted that two pin hole leaks were identified on a buried condensate line. It is unclear to the staff if the pin hole leaks were due to internal or external corrosion.
- The staff reviewed CR 1068384 and noted that a few areas of missing coating were found on buried stainless steel containment spray piping.

- The staff reviewed CA 126782 and noted that operating experience documents corrosion damage and failures resulting from damaged or poorly applied coatings.
- The staff reviewed ETE-SU-2014-0080 and noted that (a) for buried stainless steel piping, there have been sporadic cases where poor coating adhesion or existing coating damage was identified and cases where certain systems were essentially uncoated; and (b) for buried steel piping, there have been sporadic cases where poor coating adhesion or existing coating damage has been identified.

The staff also noted that in October 2008, degraded coatings were detected on a 10-inch fire protection line. Although intact coatings were on exposed portions of the piping, other areas with backfill material imbedded in the coating were easily removed by hand tools.

Issue:

Given the adverse plant-specific operating experience regarding degraded coatings, the basis provided for excluding the gray cast iron piping and components in the FP system from the scope of the Selective Leaching program is not adequate. Given the degradation of the coatings, graphitic corrosion could occur on the external surfaces of the FP piping. The staff recognizes that plug like loss of material would not necessarily be safety significant because it could be identified by leakage detectable with jockey pump monitoring. However, graphitic corrosion can also proceed in a layer like mechanism. This mechanism could result in structural collapse of the piping with resulting loss of intended function of the system.

Based on a review of *Protecting a Pipeline When Its Coating Has Aged*, the expected life of coal tar enamel or asphalt enamel coatings for buried pipelines is 20 to 30 years. The staff notes that the bituminous coatings used on the external surfaces of buried fire water system piping are similar to coal tar/asphalt enamel coatings. The staff recognizes that there will be variability in the actual rate of degradation of these coatings; however, over an 80-year period, it would be expected that some degree of loss of coating integrity will occur.

Request:

Given the plant-specific operating experience to date and the potential for further coating degradation, state the basis for excluding managing loss of material due to selective leaching for the buried FP piping.

Reference.

Protecting a Pipeline When Its Coating Has Aged. *Materials Performance* Magazine. Larsen, Kathy Riggs. January 2017 Edition, page 24.