SeabrookNPEm Resource

From: Plasse, Richard
Sent: Wednesday, December 08, 2010 10:53 AM
To: Cliche, Richard
Subject: Draft AMP RAIs
Attachments: RAI Set5 - Aging Managment Programs.doc

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From: Plasse, Richard

Created By: Richard.Plasse@nrc.gov

Recipients:
"Cliche, Richard" <Richard.Cliche@fpl.com>
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RAI Set5 - Aging Managment Programs.doc	52222	

Options
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dRAI B.2.1.20-1

Background
GALL AMP XI.M32, "One-Time Inspection" states in element 4, "detection of aging effects" that the inspection includes a representative sample of the system population, and, where practical, focuses on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin.

LRA Section B2.1.20, One-Time Inspection, states that the inspection sample includes locations where the most severe aging effect(s) would be expected to occur. The inspection population will be based on such aspects of the systems and components as similarity of materials of construction, operating environment, and aging effects. The sample size will be based on such aspects of the systems and components as the specific aging effect, location, system, and structure design, materials of construction, service environment, or previous failure history. The selection criteria will include stagnant or low-flow areas.

Issue
Due to the uncertainty in determining the most susceptible locations and the potential for aging to occur in other locations, the staff noted that large sample sizes (at least 20%) may be required in order to adequately confirm an aging effect is not occurring. The applicant's One-Time Inspection Program did not include specific information regarding how the selected set of components to be sampled or the sample size will be determined.

Request
Provide specific information regarding how the selected set of components to be sampled will be determined and the size of the sample of components that will be inspected.

dRAI B.2.1.22-1

Background
LRA Section B.2.1.22 states that the cathodic protection system protects the service water, diesel generator cooling water and instrument air piping systems as well as portions of the fire protection and control building air handling system. The staff noted that the auxiliary boiler, auxiliary steam condensate, auxiliary steam heating, condensate, feedwater, and plant floor drains as well as portions of the control building air handling and fire protection systems are not provided with cathodic protection. The applicant stated that opportunistic and/or directed visual inspections will be performed in areas with the highest likelihood of corrosion problems or areas with a history of corrosion problems.

Issue
For the cathodically protected portions of in-scope buried piping, given that coatings can be missing, degraded or nonconforming (e.g., holidays), the staff believes that a cathodic

protection system is most effective when it is available at least 90% of the time or not frequently removed from service. The LRA does not contain details on the availability of the cathodic protection system.

Given that several in-scope buried piping systems do not have cathodic protection, selection of inspection quantities and locations is particularly important to ensure that the most susceptible locations are being inspected. The applicant did not provide details on how it will determine localized data (e.g., soil pH, composition of the soil, water table, chemical runoff probability, soil resistivity, and potential for stray currents) or localized corrosion rates in order to inform its inspection quantities and locations. As a result of not having this information, the staff cannot make a determination that the number and locations of planned buried piping inspections is sufficient to provide reasonable assurance that the pipe wall thickness will meet or exceed design minimum values throughout the period of extended operation.

Request

Note: Although gray cast iron is included within the scope of the GALL Report Section IX definition of steel, the below request does not apply to piping segments constructed of this material in the fire protection system.

For the in-scope buried piping systems that are protected by a cathodic protection system, state the availability of the cathodic protection system, and if portions of the system are not available 90% of the time or will be allowed to be out of service for greater than 90 days in any given year, justify how the piping will meet or exceed the minimum design wall thickness throughout the period of extended operation.

For the in-scope buried systems and portions of systems constructed of steel that are not cathodically protected:

a. State the lengths of the in-scope buried portions of piping for each system that is not provided with or only potions are provided with cathodic protection.
b. Provide details on plant-specific data of localized soil conditions (e.g., pH, composition of the soil, water table, chemical runoff probability, soil resistivity, potential for stray currents), plant –specific operating experience, and localized corrosion rates that will be utilized to optimize inspection quantities and locations. If this data does not exist, state what samples will be taken and how they will be utilized in selecting inspection locations.
c. Justify the basis of the inspection population size (i.e., linear feet of buried piping) in relation to standard industrial sampling methods so as to provide a reasonable assurance that the pipe wall thickness will meet or exceed design minimum values throughout the period of extended operation.

dRAI B.2.1.22-2

Background

In footnote 5 to the Buried Pipe Inspection Locations chart in the “detection of aging effects” program element, the applicant stated that if during inspections of a particular material type,

damage to coatings or base materials is determined to have been caused by backfill, the backfill will be considered to be “inadequate” for that material type only. The staff noted that the number of proscribed inspections increases if backfill is determined to be inadequate. In the “preventive action” program element, the applicant did not state that backfill requirements were dependent on the material type of the buried pipe.

Issue
Given that backfill specifications are not dependent on the material type of the buried pipe, the staff believes that the results of inspections of backfill quality for a given piping material (e.g., steel) should be applied to the inspection sample size of the other material types (e.g., stainless steel, polymeric).

Request
Justify why an inadequate backfill determination for a single material type inspection should not be applied to the other material types.

dRAI B.2.1.22-3

Background
In LRA Section B.2.1.22 the applicant stated that the service water system contains inaccessible submerged steel piping exposed to raw water in two vaults, one with four fifteen foot lines and one with a piping segment less than ten feet long. The applicant also stated that the piping is cathodically protected and coated. During the AMP audit the applicant stated that these vaults are normally filled with raw water but are periodically drained to conduct inspections. The applicant further stated that the vault containing this piping gradually re-fills with raw water as a result of in-leakage of groundwater.

Issue
The staff does not have sufficient information to determine how visual inspections of the external surfaces of the piping (i.e., inspection of the coatings) will detect corrosion of the piping that can occur either through permeability of the coating or coating holidays that remain undetected. Coatings, in this case, could mask an on-going corrosion issue.

Request
State how the corrosion of the piping that could occur either through permeability of the coating or coating holidays that remain undetected will be detected.

dRAI B.2.1.22-4

Background
In LRA Section B.2.1.22, the applicant stated that in November 2000, buried in-scope fuel supply piping leaked as a result of damaged wrapping. The applicant also stated that during subsequent extent of condition inspections of the same piping system, further damage was discovered, ultimately leading to a decision to not return this buried fuel supply line to service. In footnote 5 to the Buried Pipe Inspection Locations chart in the “detection of aging effects” program element, the applicant stated, “This line is not in use and has been drained and flushed and is awaiting replacement per a design change. The inspection criteria for the replacement piping will be determined based [on] material selection, coating, cathodic protection and quality

of backfill." During the audit the applicant stated that temporary fuel oil piping and tanks have been installed to replace the effected buried fuel oil supply piping and the associated above-ground fuel oil storage tank.

Issue

Given that the leakage from the buried fuel oil supply piping was the result of corrosion due to degraded wrapping, what extent of condition reviews were conducted to evaluate the condition of the wrapping for other in-scope systems containing non-cathodically protected, buried piping.

The staff noted that temporary piping and tanks are currently installed to support the in-scope function once served by the buried fuel oil supply piping and the associated above-ground fuel oil storage tank. The staff also noted that the LRA does not discuss if/when this temporary arrangement will be replaced with a permanent arrangement or how either the temporary piping and tanks or permanent arrangement will be age managed through the period of extended operation.

Request

1. Provide details (if any) regarding what extent of condition reviews, beyond the inspections performed of the fuel oil piping system, were conducted to determine the extent of coating damage in other in-scope, non-cathodically protected, buried piping systems.
2. Given that temporary piping and tanks are currently installed to support the in-scope function once served by the buried fuel oil supply piping and the associated above-ground fuel oil storage tank, describe how either the temporary piping and tanks or a possible future permanent arrangement will be age managed through the period of extended operation.