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OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of Entergy (Pilgrim Nuclear Power Station)

Docket No. 50-293-LR Official Exhibit No. 71

OFFERED by: Applicant/Licensee (Inter) Pilgrim Watch Ex 58

NRC Staff Other

IDENTIFIED on 4-10-08 Witness/Panel

Action Taken: ADMITTED REJECTED WITHDRAWN

Reporter/Clk: Thibault

XI.M28 BURIED PIPING AND TANKS SURVEILLANCE

Program Description

The program includes surveillance and preventive measures to mitigate corrosion by protecting the external surface of buried carbon steel piping and tanks. Surveillance and preventive measures are in accordance with standard industry practice, based on National Association of Corrosion Engineers (NACE) Standards RP-0285-95 and RP-0169-96, and include external coatings, wrappings, and cathodic protection systems.

Evaluation and Technical Basis

1. **Scope of Program:** The program relies on preventive measures, such as coating, wrapping, and cathodic protection, and surveillance, based on NACE Standard RP-0285-95 and NACE Standard RP-0169-96, to manage the effects of corrosion on the intended function of buried tanks and piping, respectively.
2. **Preventive Actions:** In accordance with industry practice, underground piping and tanks are coated during installation with a protective coating system, such as coal tar enamel with a fiberglass wrap and a kraft paper outer wrap, a polyolifin tape coating, or a fusion bonded epoxy coating to protect the piping from contacting the aggressive soil environment. A cathodic protection system is used to mitigate corrosion where pinholes in the coating allow the piping or components to be in contact with the aggressive soil environment. The cathodic protection imposes a current from an anode onto the pipe or tank to stop corrosion from occurring at defects in the coating.
3. **Parameters Monitored/Inspected:** The effectiveness of the coatings and cathodic protection system, per standard industry practice, is determined by measuring coating conductance, by surveying pipe-to-soil potential, and by conducting bell hole examinations to visually examine the condition of the coating.
4. **Detection of Aging Effects:** Coatings and wrapping can be damaged during installation or while in service and the cathodic protection system is relied upon to avoid any corrosion at the damaged locations. Degradation of the coatings and wrapping during service will result in the requirement for more current from the cathodic protection rectifier in order to maintain the proper cathodic protect potentials. Any increase in current requirements is an indication of coating and wrapping degradation. A close interval pipe-to-soil potential survey can be used to locate the locations where degradation has occurred.
5. **Monitoring and Trending:** Monitoring the coating conductance versus time or the current requirement versus time provides an indication of the condition of the coating and cathodic protection system when compared to predetermined values.
6. **Acceptance Criteria:** In accordance with accepted industry practice, per NACE Standard RP-0285-95 and NACE Standard RP-0169-96, the assessment of the condition of the coating and cathodic protection system is to be conducted on an annual basis and compared to predetermined values.

Temp = SEC4-028

7. **Corrective Actions:** The site corrective actions program, quality assurance (QA) procedures, site review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions, confirmation process, and administrative controls.
8. **Confirmation Process:** See Item 7, above.
9. **Administrative Controls:** See Item 7, above.
10. **Operating Experience:** Corrosion pits from the outside diameter have been discovered in buried piping with far less than 60 years of operation. Buried pipe that is coated and cathodically protected is unaffected after 60 years of service. Accordingly, operating experience from application of the NACE standards on non-nuclear systems demonstrates the effectiveness of this program.

#### References

- 10 CFR Part 50, Appendix B, *Quality Assurance Criteria for Nuclear Power Plants*, Office of the Federal Register, National Archives and Records Administration, 2005.
- NACE Standard RP-0169-96, *Control of External Corrosion on Underground or Submerged Metallic Piping Systems*, 1996.
- NACE Standard RP-0285-95, *Corrosion Control of Underground Storage Tank Systems by Cathodic Protection*, Approved March 1985, revised February 1995.