

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NOS. 50-352/94-04
50-353/94-04

LICENSE NOS. NPF-39
NPF-85

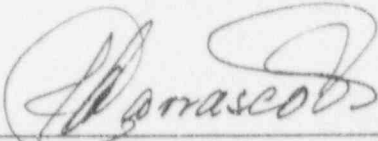
LICENSEE: Philadelphia Electric Company
Post Office Box A
Sanatoga, Pennsylvania 19464

FACILITY NAME: Limerick Generating Station, Units 1 & 2

INSPECTION AT: Chesterbrook and Sanatoga, Pennsylvania

INSPECTION DATES: January 31, 1993 - February 4, 1994

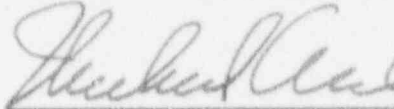
INSPECTOR:



Joseph Carrasco, Reactor Engineer
Materials Section, EB, DRS

02/22/94
Date

APPROVED BY:



Michael C. Modes, Chief
Materials Section, EB, DRS

2/23/94
Date

Areas Inspected: A safety inspection was conducted to assess the licensee's engineering proficiency in the design modifications 6236 emergency service water (ESW) and residual heat removal service water (RHRSW) improvement program, including interfaces with other internal and external organizations.

Results: The licensee has technical skills, in-house, capable of providing adequate coverage and oversight for the contractor implementing the modifications. During the plant onsite review committees (PORCs) technical discussions, the inspector noted that its members displayed good command of the plant systems. Safety perspective is maintained among the engineers and system manager. Team work and mutual cooperation between the corporate personnel and site personnel is evident.

Background: In response to problems encountered with raw water systems at both Peach Bottom and Limerick, the licensee developed a raw water task force (RWTF). Individuals involved in this task force include system managers, site chemistry, corporate chemistry, and corporate engineering; utilizing various other groups as required for specific input. The licensee has focused on the safety-related segment of the RWTF. For this purpose, a subgroup was organized to evaluate and determine solutions to problems. This subgroup took the form of a modification team (Mod 6236).

DETAILS

1.0 PURPOSE OF THE INSPECTION

The purpose of this inspection was to assess the licensee's engineering proficiency in the design modifications 6236 emergency service water (ESW) and residual heat removal service water (RHRSW) improvement program, including interfaces with other internal and external organizations.

2.0 REVIEW OF DESIGN MODIFICATION 6236 ESW AND RHRSW IMPROVEMENT PROGRAM

The inspector reviewed the present scope for modification 6236, divided into an efficient and manageable series of smaller modification scopes, summarized below:

- P00058 - This modification provides additional isolation capabilities for the ESW system by adding manual isolation valves. The benefit of this modification include minimizing probabilistic risk assessment (PRA) impact when pipe repairs or other maintenance activities require access to pipe internals.
- 6194 - This modification adds manual isolation valves to the RHRSW system providing the capability to isolate large portions of supply and return header pipe and the RHR heat exchangers and their associated throttle valves for maintenance while maintaining the other heat exchanger in the loop operable.
- P0166 - This modification will help to minimize the ESW pipe common to both units by providing separate supply headers in the reactor building pipe tunnel to the two units.
- P0167 - This modification will provide a cross tie between the ESW and RHRSW supply headers directly down stream of the pumps and again in the reactor building pipe tunnel. This will allow maintenance activities to be performed in one header, while the remaining header transports both system's cooling water to the pipe tunnel.
- P0168 - This modification will provide a cross-tie in the reactor building pipe tunnel between the RHRSW return headers. The benefits are similar to P0167.

2.1 Review of Modification P-0166, P-0167 and P-0168

The inspector reviewed the general layout conceptual drawings, observed activities related to a proposed one-time technical specification change to extend the allowed outage time to accommodate the modifications P-0166, 0167, and 0168. The inspector observed activities related to the review of the safety analysis for modifications P-0166, 0167, and 0168. The inspector discussed proposed conceptual models for the piping analysis and walked-down the pipe tunnel in an area where substantial modifications will be taking place. The inspector discussed conceptual design for modification P-167-0 (design of two concrete vaults).

2.2 Plant On-site Review Committee (PORC) Meeting

The ESW and RHRSW systems at Limerick Generating Station consist of two independent loops, common to both units (Loops "A" and "B"). The "B" loop of each system will be taken out-of-service during refueling outage 2RO3.

The inspector attended the licensee's PORC meeting to review the 10 CFR 50.59 analysis for licensing change request (LCR) 94-04-01. This LCR proposed a one-time technical specifications change to extend the allowed outage times (AOT) for ESW and RHRSW to support the installation of the "B" loop portions of modifications P-0166, P-0167 and P-0168. LCR 94-04-1 applies to Unit 1 because the modification will be implemented during the Unit 2 refueling outage 2RO3.

During the meeting, the inspector noted that comments, concerns and observations made by the system managers are discussed and resolved expeditiously in the form of commitments or corrections to 10 CFR 50.59 analysis. For example: a question was raised regarding service water availability to inoperable emergency core cooling system (ECCS) components. The PORC commitment was initiated to assess service water cooling to the ECCS components on Unit 1. If this is feasible, it will be included in a special procedure.

The licensee's PORC discussed the fire aspects of rendering a loop of ESW and RHRSW inoperable. The PORC recognized there are administrative controls in existence to minimize the potential for a fire. These controls ensure fire detection and suppression systems are operable. These controls also ensure that training and technical specification requirements for fire brigades provide a reasonable assurance of the plant ability to prevent or mitigate the consequences of a fire so that safe shutdown can be achieved. In addition, compensatory measures which can be taken during this extended AOT were discussed in-depth. These compensatory measures will be ruled by a criteria which will be established in a special procedure governing the AOT. The licensee stated that the PORC will have an opportunity to review these measures because special procedures require PORC approval.

For the purpose of this inspection, during the PORC meeting, the inspector noted good communication, adequate level of technical expertise and adequate command of the plant systems. However, this 10 CFR 50.59 analysis is pending approval by the NRC.

2.3 Review of 10 CFR 50.59 Safety Analysis for P-0166, P-0167, and P-0168

This 10 CFR 50.59 analysis addresses three modifications corresponding to a) installation of an ESW supply and return unitizing jumper (P-0166); b) installation of cross-ties between the ESW and the RHRSW systems (P-0167) and; c) installation of a cross-tie between the "A" and "B" RHRSW return loops (P-0168).

The inspector conducted meetings to discuss the safety aspects of the modifications and the adequacy of the 10 CFR 50.59 analysis. During these meetings, the inspector noted that the participation of other organizations affected by the modification or directly involved in the analysis, design, and implementation of these modifications was adequate. During these interactions, the technical details were discussed and satisfactory resolution obtained.

During the discussions, it was noted that the proposed cross-tie between the return RHR lines would eliminate separation and independence. The inspector conducted a number of meetings to discuss acceptable alternatives to resolve this issue. The licensee is considering alternatives which involve the revision of the 10 CFR 50.59 analysis.

2.4 Review of the Conceptual Design for Modification P-167-0

To accommodate Modification P-0167, the licensee will install two concrete pits in the vicinity of the spray pond pump-house. These two pits will be separated from each other by reinforced concrete vaults to provide housing for one of the two proposed cross-ties and the associated isolation. These cross-tie will allow the isolation and draining of the underground portion of the ESW or RHRSW supply piping for inspection or repairs without requiring a unit outage.

The licensee stated that the concrete vaults will be designed as seismic category I. Several conceptual drawings were reviewed and details and recommendations were discussed. In these discussions, the licensee stated that for the excavation of the pits space all precautions will be taken to protect any underground piping or electric conduits during excavation.

In the event that an underground duct or piping is found, it will be properly rerouted and/or will be properly supported with seismically designed supports/restraints. The inspector had no further questions.

2.5 Conclusion

The licensee has the technical skills in-house capable of providing for adequate coverage and oversight of the contractor implementing the modifications. During the PORC's technical discussions, the inspector noted that its members displayed good command of the plant systems. Safety perspective is maintained among the engineers and system manager. Team work and mutual cooperation between the corporate personnel and the site personnel is evident.

3.0 (CLOSED) UNRESOLVED ITEM NO. 93-05-01 LACK OF ROOT CAUSE ANALYSIS FOR A MAJOR FAILURE CONTRIBUTOR OF SNUBBERS "DRY GREASE" OR A COMPREHENSIVE CORRECTIVE ACTION

Background

During refueling outages 1RO4 and 2RO2 at Limerick Generating Station, Units 1 and 2 respectively, a large number of small pipe snubbers did not meet functional test acceptance criteria. The failures were attributed to "Dry Grease" in the snubber mechanism.

On January 25-29, 1993, the USNRC conducted an inspection of engineering activities relating to safety-related dynamic pipe restraints (snubbers) and static pipe supports, including the snubber surveillance program. An unresolved item, 93-05-01, was observed regarding the lack of a root cause analysis for major failure contributor of snubbers "Dry Grease" or a comprehensive corrective action.

Assessment

The inspector reviewed the licensee's root cause analysis in which the licensee determined that the snubber lubrication (grease) was damaged during storage. Chevron NRRG-159 Radiation Resistant Grease has been found to degrade over time. The Limerick Generating Station snubbers are 1980-1981 vintage and were subjected to extended periods of storage during plant construction in both warehouse and inplant environments. The licensee concluded that the oxidizing agents in normal air and construction dust contributed to degradation of the lubricant.

The "Dry Grease" problem was found to be limited to size PSA-1/4 and PSA-1/2 snubbers. The utilities entire population of Unit 1 and Unit 2, PSA-1/4 and PSA-1/2 snubbers have been functionally tested since the start of plant operation. Snubbers not meeting the testing criteria were disassembled, reworked and replaced. Further, snubber Maintenance Procedure M-C-700-320, 321 and 322 have been prepared in accordance with the snubber vendor's "new" lubrication criteria.

Conclusion

The inspector found that the licensee's response to this unresolved item, which includes a complete, thorough analysis and adequate corrective and preventive actions, is acceptable. Therefore, unresolved item 50-352/93-05-01 and 50-353/93-05-01 are closed.

4.0 MANAGEMENT MEETINGS

Licensee management was informed of the scope and purpose of the inspection at the beginning of the inspection. The findings of the inspection were discussed with the licensee management at the February 4, 1994, exit meeting. See Attachment 1 for attendance.

ATTACHMENT 1

Persons Contacted

Philadelphia Electric Company

- * G. V. Cranston Director of Nuclear Engineering
- F. Valentino Manager-Engr. Assurance
- * G. Beck Manager of System Design
- D. B. Neff LGS Licensing Engineer
- * S. Palena Engineering Assurance
- * K. Borton Licensing Engineer
- * R. Dickinson Branch Manager-NSSS
- * G. Reid Branch Manager-BOP
- * K. Knaide Project Engineer

U.S. Nuclear Regulatory Commission

- * M. C. Modes Chief, Materials Section

- * Denotes those present at the exit meeting