U.S. NUCLEAR REGULATORY COMMISSION
REGION I

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LICENSE NOS:	NPF-39 and NPF-83
LICENSEE:	Philadelphia Electric Company Post Office Box A Sanatoga, Pennsylvania 19464
FACILITY NAME:	Limerick Generating Station, Units 1 & 2
INSPECTION AT:	Chesterbrook and Sanatoga, PA
INSPECTION CONDUCTED:	August 16-20, 1993

INSPECTORS: J. Carrasco 9-3-93

J. E. Carrasco, Reactor Engineer — Date
Materials Section, Engineering Branch, DRS

APPROVED BY: E H Gray 9/9/93

Edwin H. Gray, Chief — Date
Materials Section, Engineering Branch, DRS

Inspection Summary:

Areas Inspected: An announced safety inspection was conducted to assess the adequacy of the licensee's selected programs for engineering and technical support of plant operations. This review included examination of the design modification process, configuration management, performance enhancement program (PEP), and the emergency service water (ESW) and residual heat removal service water (RHRSW) improvement programs.

Results: The licensee's design modification program at Limerick has been enhanced with the introduction of newly-revised common procedures for both nuclear stations (LGS and PBAPS). These enhancements to the procedures were done unparallel to the expansion of computer capabilities of the plant information management system (PIMS). These expanded PIMS capabilities enable the licensee to incorporate design modification data of activities such as material procurement, work planning, task tracking, and document control. These computerized activities are consistent with activities described in the newly developed design procedures making the design modification process for the stations effective and efficient.

The Performance Enhancement Program (PEP) provides the licensee's Nuclear Group with a tool to improve its performance through continual evaluation of self-identified conditions adverse to quality and other enhancement opportunities. It has an adequate procedure that is depicted in a flow chart, as well as easy-to-follow computerized training for the plant personnel.

The licensee's general policy on Configuration Management is outlined in the Nuclear Group Directive No. ND-CM-1, titled, "Configuration Management." In this document, management commitment and proper configuration control are evident. It was carried out in the Limerick's Integrated Nuclear Cable Management System (INCMS), As-Built Reconciliation of ASME Class 1, 2, and 3 Large and Small piping systems, and in the control of hazard barriers and penetration seals. The licensee was found to have a good configuration management program.

The licensee has in-house technical skills capable of providing adequate coverage and oversight for the contractor who will implement the ESW and the RHRSW modifications.

DETAILS

1.0 PURPOSE OF THE INSPECTION

The purpose of this inspection was to assess the adequacy of the licensee's selected programs for engineering and technical support of the plant operations including management support, interfaces with other internal and external organizations, design modifications, and experience and professional proficiency of the engineering staff engaged in the design modifications.

2.0 FINDINGS

2.1 Design Modification Program (37700)

As part of a major procedure/process improvement program at the Limerick Generating Station (LGS) and the Peach Bottom Atomic Power Station (PBAPS), the licensee's design modification process/procedure was revised to improve procedures that in the past were fragmented, inconsistent, and had configuration control problems. These procedures also had undefined processes for equivalent replacement and simple modifications. In addition, they were written to reflect different LGS/PBAPS processes.

As a result of the procedure/process improvement program, the present design modification process at LGS and PBAPS was combined in a series of twelve procedures. These are Mod Process Initiation (MOD-C-1), Mod Process Conceptual Design (MOD-C-2), Mod Process Design (MOD-C-3), Mod Process Installation (MOD-C-4), Mod Process Acceptance Testing (MOD-C-5), Mod Process Closure (MOD-C-6), Control and Processing of Engineering Change Request (ECRs) (MOD-C-9), Control of Design Baseline Documents (DBDs) (MOD-C-11) and Equipment Qualification Program (MOD-C-12).

The inspector reviewed these procedures and in particular compared procedure MOD-C-3, Rev. 1, titled, "Mod Process Design," with its old version, which is procedure NEDP 3.1, Rev. 20, titled, "Procedure for Handling Modifications." The inspector noted that the new revised procedure MOD-C-3 is brief and concise. In the improved procedure MOD-C-3, the unnecessary or/and redundant information was eliminated or minimized.

The inspector noted that among other improvements of the MOD-C-SERIES that govern the design modification process are the following: clear definition of types of modifications and one process or set of processes for accomplishing modifications was evident; commonality and consistency existed between PBAPS and LGS; early project sponsorship for mods clarified and streamlined roles and/or responsibilities with emphasis on accountability; and a lead station representative role for modifications was established. The inspector also noted that the lessons learned check list has been incorporated as process steps. The Plant Operations Review Committee (PORC) role emphasizes safety aspects of the modification

over the purely technical adequacy review of modification design. The new process features access to Plant Information Management System (PIMS) for items such as project planning, scheduling, status, and reporting.

The inspector interviewed engineers who recently used the new revised design procedures, and they stated that, although it is early to determine the effectiveness of the new procedures, they found no problems. In fact, the features required in the new procedures match the format and the sequence presented in PIMS.

The inspector commented that the regulatory requirements, although built into the procedures, are not annotated in the pertinent sections of the procedure. The licensee acknowledged the inspector's comment and stated that the generic regulatory requirements will be annotated in the pertinent section of the procedures.

Conclusion

Based on the assessment described above, the inspector concluded that the licensee's design modification program at Limerick has been enhanced with the introduction of newly revised common nuclear station (LGS and PBAPS) procedures. These enhancements to the procedure were done parallel to the expansion of computer capabilities of PIMS. This computer enhancement has enabled the licensee to incorporate design modification data of activities such as material procurement, work planning, task tracking, and document control. These computerized activities are consistent with activities described in the newly-developed design procedures making the design modification process for the stations more effective and efficient.

2.2 Performance Enhancement Program (PEP)

The inspector reviewed the licensee's PEP. This program provides the licensee's Nuclear Group an opportunity to improve its performance through continual evaluation of self-identified conditions adverse to quality and other enhancement opportunities. It also provides direction for the identification and evaluation of issues to ensure that they are thoroughly reviewed, that causal factors are properly identified, generic implications are considered, and that actions to correct the issues and to prevent their recurrence are implemented.

PEP will enable the licensee's nuclear group to provide direction for the development and dissemination of completed reports. It also describes the program responsibilities and interfaces, and identifies the types of issues requiring a formal root cause analysis.

The licensee explained that this process will not create any conflict with the existing nonconformance reports (NCRs) for hardware deficiencies. The NCR process will continue to be controlled by procedure CNP A-C-901.

The inspector was given a practical demonstration of the capabilities the PEP has in PIMS. The inspector noted that, upon entering the system program PEP, the screen displayed a menu of options that are action requests, quality evaluations, initiate project action requests, PEP issues, and recurring tasks. Events are entered in PIMS as PEP issues and evaluated to identify causal factors, to identify generic implications, to perform root cause analysis, to develop corrective actions and prevent recurrence. An issue, as defined in PEP, is a condition adverse to quality, problem or potential problem, concern, undesired occurrence, or a near miss.

The inspector verified that these features are available to plant personnel to be able to enter a safety concern into the system to be assessed electronically by a number of cognizant individuals. The system also will electronically notify shift management, assign a corrective action engineer, quality assurance specialist, and a health physics specialist. The inspector verified that the access to a specific block of the entered safety concern is secured as "need to know" basis. For example, reportability block can be accessed by the reportability specialist. The inspector ensured that the procedure governing PEP/PIMS (LR-C-10, Rev. 1) clearly noted that safeguards information shall not be entered into PIMS.

Conclusion

Based on the review of the procedure that governs the Performance Enhancement Program (PEP) LR-C-10, Rev. 1, the practical demonstration, and the interviews with the cognizant personnel, the inspector concluded that it has an adequate procedure, and an easy-to-follow computerized training for the plant personnel.

2.3 Configuration Management (CM)

To assess the licensee's configuration management, the inspector selected the mechanical piping and penetration area. Electrical configuration's Integrated Nuclear Cable Management System (INCMS) was reviewed in previous NRC-Region I Inspection Nos. 50-352/93-15 and 50-353/93-15.

Mechanical piping configuration at Limerick 1 was conducted under the As-Built Reconciliation of ASME Class 1, 2, and 3 Large and Small piping systems in accordance with Specification 8031-P-366. Modification of piping systems after completion of construction code work was governed by Specification 8031-G-33 (ASME Systems) or by appropriate Contractor Maintenance and Modification Procedures (Non-ASME Systems). The licensee indicated that Plant Design Drawing and Calculation Control Document was created to prevent unnecessary revision of plant design documents. It was prepared by the Plant Design Group to provide the latest information status of piping stress calculations, hanger guidance, hanger details, pipe support calculations, and stress isometric/data points. These activities were governed by a written specification 8031-P-366 whose revision 5 was issued on September 1985.

Limerick Unit 2, as a later vintage, had the requirements of Bulletin 79-02 and 79-14 built into the construction activities. However, mechanical piping configuration was further ensured with a program that consisted of an As-Built Reconciliation (ABR) program. This program covered ASME Section III and/or Seismic Category I piping systems including matching with the isometrics and Non-ASME Seismic Category II and IIA piping systems. These activities were governed by a written specification 8031-P-366-2, Revision 3, which was issued on January 17, 1990.

Based on the interviews with the piping stress engineer and the review of the As-Built Reconciliation of ASME Class 1, 2, and 3 Large and Small piping systems program Units 1 and 2 specifications, the inspector concluded that the licensee has adequate piping configuration program specifications.

2.4 Hazard Barrier and Penetration Seal Program

At LGS, the hazard barrier program encompasses structural steam, water, air, radiation, fire, and security barriers. Penetration seals, doors, and steam vent paths within these barriers are also included. This particular program does not address primary containment boundaries or penetrations.

The inspector interviewed a number of engineers who played an important role in this program. During a meeting, it was verified that the licensee maintains configuration of hazard barriers and penetration seals with a series of control drawings Nos. LGS A-305 through A-311. These drawings show the location of steam, water, air, fire, and security barriers on each plant elevation. These drawings, as the licensee explained, are updated as design information changes through program evolutions or plant modifications. Through a practical demonstration on PIMS, the inspector verified that tracking of these drawings is evident.

The inspector noted that the licensee has sufficient and adequate administrative and technical tools to ensure configuration of the hazard barrier and penetration seal program. Administrative procedure A-C-134 provides configuration control for barriers as shown on the hazard barrier plans. This procedure is common to LGS and PB stations, with plant unique information provided in the exhibits. The technical requirements for dealing with penetrations in hazard barriers for both stations are clearly defined in specification NE-075.

The inspector noted that, as a result of the licensee's enhancement programs, various NED procedures were modified to enhance the configuration control of hazard barriers. The licensee stated that the revisions were intended to ensure that designs requiring the breaching of hazard barriers would not have adverse impact to equipment and/or system operability and plant safety. The inspector verified that this enhancement was incorporated in NED guideline No. NED-UG-8. This guideline is used by the licensee when performing design related activities that affect penetration seals in hazard barriers.

Based on the assessment for the configuration control of hazard barriers and penetration seals, the inspector concluded that the hazard barrier plan drawings, station administrative controls, engineering specification, engineering procedures, engineering guidelines, penetration seal details, and penetration seal location documentation are functioning and adequately documented.

Conclusion

Based on the interview with the cognizant responsible engineer and the review of key portions of the electrical configuration's Integrated Nuclear Cable Management System (INCMS) (NRC-Region I inspection Nos. 50-352/93-15 and 50-353/93-15), As-Built Reconciliation of ASME Class 1, 2 and 3 Large and Small piping systems program for Units 1 and 2 and the configuration control of hazard barriers and penetration seals, the inspector concluded that the licensee's general policy on Configuration Management is outlined in the Nuclear Group Directive No. ND-CM-1, titled, "Configuration Management." In this document, management commitment is evident. Therefore, it was concluded that the licensee had an adequate configuration program.

2.5 ESW and RHRSW Improvement Project

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 included 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 the problems. This subgroup took the form of a modification team (Mod 6236). Several alternative solutions were considered and narrowed down to three potential solutions. At this point, a contractor was brought in to supplement the modification team. Under the oversight of the licensee, the contractor developed the final report with a suggested comprehensive plan.

The responsible engineer for modification 6236 summarized for the inspector the task force activities and the results of their studies that were formally presented to the licensee's Senior Management with the following key points:

- P00058 - This modification would provide additional isolation capabilities for the ESW System by adding manual isolation valves. The benefits of this modification include minimizing Probabilistic Risk Assessment (PRA) determined vulnerabilities when pipe repairs or other maintenance activities require access to pipe internals.

- 6194 - This modification adds manual isolation valves to the RHRSW System. It provides the capability to isolate large portions of supply and return header pipe in addition to the RHR heat exchangers and their associated throttle valves for maintenance while maintaining the other heat exchanger in the loop operable.

- P0166 - This modification would help to minimize the amount of ESW pipe common to both units by providing separate supply headers in the Reactor Building Pipe Tunnel to the two units.

- P0167 - This modification would 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 and inspection activities to be performed in one header while the remaining header transports both system's cooling water to the pipe tunnel.

- P0168 - This modification would provide a cross-tie in the Reactor Building Pipe Tunnel between the RHRSW return headers. The benefits are similar to P0167.

The inspector conducted a walkdown of piping segments of the ESW and RHRSW that will be required to be modified to accommodate the modifications outlined above. It is early to assess the specifics of the planned modifications.

Conclusion

The licensee has the in-house technical skills capable of providing the adequate coverage and oversight for the contractor who will implement the modifications.

3.0 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 August 20, 1993, exit meeting. See Attachment 1 for attendees.

Attachment: Persons Contacted

ATTACHMENT 1

Persons Contacted

Philadelphia Electric Company

* J. Muntz	Director, Site Engineering, Limerick
H. W. Vollmer	Sr. Manager of Civil and Mechanical Engineering
F. X. McCreesh	Manager Structural Engineering Branch
R. D. McKeeman	Branch Head
* J. J. Gyrath	Branch Head Engineering Assurance
* J. F. O'Rourke	Sr. Manager Design Engineering

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* T. Easlick	Resident Inspector

* denotes those present at the exit meeting