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SUBJECT: Responds to weaknesses noted in Special Maint Team Insp  
 Repts 50-387/90-81 & 50-388/90-81. Corrective actions: Station  
 Policy Ltr 89-003 re control & verification of operating  
 actions will be revised.

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**SUSQUEHANNA STEAM ELECTRIC STATION**  
**REPLY TO WEAKNESSES, INSPECTION REPORT**  
**NOS. 50-387/90-81; 50-388/90-81**  
**PLA-3573 FILE R41-2**

Appendix 2 to Inspection Report Nos. 50-387/90-81; 50-388/90-81 listed weaknesses found during the Susquehanna SES special maintenance team inspection. The report requested notification, in writing, of planned and completed, corrective actions taken to improve our maintenance program in the areas where weaknesses were identified within 60 days of receiving the notice. Accordingly find attached Pennsylvania Power & Light Company's response to the identified weaknesses.

If you have any questions, please contact Mr. W. W. Williams at (215) 774-7910.

Very truly yours,

H. W. Keiser

Attachment

cc: NRC Region I - Regional Administrator  
Mr. J. J. Raleigh, NRC Project Manager (OWFN)  
Mr. G. S. Barber, NRC Sr. Resident Inspector (SSES)

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PDR ADCK 05000387  
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MISSILE HAZARD  
(Section 1.2, Page 40)

Weakness Summary

Missile hazards existing as a result of unsecured material stored in safety related areas.

Response

AD-QA-552, "Mitigating Safety Impact Concerns With Transient Equipment" has been issued. This new procedure establishes controls for the storage of transient equipment in safety-related areas including the establishing of approved storage locations.

ROOT CAUSE ANALYSIS  
(Section 3.5, Page 20)

Weakness Summary

The inspection team's findings resulted in the conclusion that a weakness existed in the program for determining matters that require root cause analysis and that application of failures to generic implications is not addressed.

Response

The requirement to review Priority 2 SOOR's for past similar events and generic implications during SOOR resolution/cause determination has always existed. The specific line item requiring this was inadvertently excluded when Rev. 8 to AD-QA-424, SOOR Program, was issued. The procedure was immediately revised to reflect this requirement. It should be noted that the Compliance Evaluators did review the SOOR's to ensure that reviews for similar events and generic implications were included, even though the administrative procedure was in error from May 1989.

PP&L recognizes that the present Root Cause Analysis program is not geared to performing formal failure analysis for component failures, unless those failures resulted in relatively significant plant transients or loss of system operability. To enhance this area, another review during the close out of each maintenance quality Work Authorization will be added to evaluate the adequacy of actions taken and to determine if a root cause or failure analysis evaluation will be pursued.

PP&L is continuing to conduct root-cause training for applicable engineering personnel and anticipates this phase of root-cause training completing this year. Training material for mechanics and technicians has been developed, with actual classroom training to follow completion of engineering personnel training.

EQ INSTRUMENT REQUIREMENTS  
(Section 5.1, Page 40)

Weakness Summary

"The inspector concluded that EQ program requirements and specific maintenance requirements on an 'instrument by instrument' basis were not well defined and integrated into EQDFs or specific station procedures. EQ instruments are not identified in the plan."

Response

The Susquehanna Equipment Information System (SEIS) database contains a field to identify EQ components at SSES. The field is controlled. The SEIS database is used by planners, engineers and foremen to provide information on equipment.

At the work group level, EQ requirements are integrated into the maintenance process. The Instrument & Controls (I&C) group developed work instruction IC-IE-05 "Maintenance of Equipment Qualifications" to capture EQ requirements and translate these requirements to the work process. The work instruction provides direction for developing Data Forms which list the EQ requirements, and the forms are included in the work package. Data Forms are developed for each type of instrument as needed.

I&C is developing Functional Equipment Groups which are listings of all instruments associated with a function. The attributes for the components will be identified as part of the group listing, including EQ status. The group starts at the highest level instrument and includes all supporting instruments.

A major Nuclear Department initiative is geared at enhancement of the EQ Program. A project is now underway which will improve and expand the EQ program, including upgrades to the EQ binders and a revision of EQPM Activities. The work is scheduled for completion in 1993.

PROCEDURE CHANGES  
(Section 5.1, Page 41 & 42)

Weakness Summary

The inspection team concluded that management oversight and timeliness of procedure changes was inadequate. The inspection report cites Procedure IC-070-001, Revision 3, "Calibration of Standby Gas Treatment System (SGTS) Alison Fire Detection and Deluge Control System" which was scheduled to be performed on October 10, 1990.

Response

Procedure IC-070-001 had been successfully completed under PM C1028-01 and C2184-01, nineteen times. After performance of the procedure on August 24, 1990, procedure comments were transmitted back from the work group which performed the procedure. The comments were reviewed by the responsible assistant foreman and I&C Engineering and the procedure was deemed to be technically adequate as written. These procedure comments were characterized as enhancements and a decision was made to verify the comments during the next performance of the PM activity. On October 10, 1990, when the procedure was scheduled to be performed, the foreman on the job, who was actually a foreman acting in the absence of the regular assistant foreman and unaware of the previous decision, elected to cancel the procedure in order to permit updating of the procedure as it was not required to be performed until November 18, 1990. Given the absence of information regarding the previously made decision with respect to the need for procedural enhancement, the decision to cancel the procedure was a responsible action. The procedure has been updated. We do not believe the example cited is indicative of inadequate management oversight or inadequate timeliness of procedure changes.

PLANNING PROCEDURES AND WORK PRACTICES  
(Section 5.1, Page 42)

Weakness Summary

On the basis of observations of the HPCI turbine overhaul, the inspection team concluded there was inadequate preplanning of work, a lack of procedural adherence and an insufficiently detailed WA package to support the evolution.

Response

The Unit 1 HPCI turbine six-year overhaul, performed per MT-052-002, was the first performance of this activity at Susquehanna SES. We agree, given the complexity of the job and the low direct experience level of the workers involved, the work package and procedures should have been more comprehensive and detailed. The evolution was undertaken knowing that the maintenance crew involved consisted of sufficient personnel possessing minimum task competence to perform the job. In addition, a maintenance foreman or assistant foreman and a vendor representative were available and in frequent communication with the crew performing the work. It was believed that this combination of personnel and supervision was adequate to satisfactorily accomplish the task of turbine overhaul. However, as observed, our level of performance did not satisfy our standards.

To raise our level of performance, the production group tailboarded the activities during and following performance of the turbine overhaul. Input from these tailboard meetings were provided to Maintenance Engineering for use in upgrading of procedure MT-052-002. The procedure has since been upgraded incorporating lessons learned.

INDEPENDENT VERIFICATION  
(Section 5.2, Page 43)

Weakness Summary

AD-QA-500, Revision 11, "Conduct of Maintenance," Sections 6.9.3 and 6.9.4 were inconsistent with the requirements of ANSI N18.7-1976, Section 5.2.6, which requires that "temporary modifications such as temporary bypass lines, electrical jumpers, lifted electrical leads and temporary trip point changes shall be controlled by approved procedures which shall include a requirement for independent verification." AD-QA-500 only requires "independent verification" for activities that would affect redundant components in multiple trains. This requirement is significantly less conservative than ANSI N18.7-1976. Although the team found no cases in which the allowance was evoked, the procedural allowance is a significant program weakness.

Response

Station Policy Letter 89-003, "Control and Verification of Operating Actions" will be revised to state which activities require "Independent Verification" versus "Verification", to be consistent with the requirements of ANSI N18.7-1976. Subsequently station section functional unit procedures will be upgraded accordingly.

PROCEDURAL IMPLEMENTATION/ADHERENCE REQUIREMENTS  
(Section 5.8, Page 52)

Weakness Summary

The inspection team found the permissive nature of AD-QA-501 inconsistent with Policy Letter 89-004 and the committed requirements of ANSI N18.7-1976 because some potentially complicated activities may be undertaken in following the cited procedures. On the basis of this finding, the inspection team concluded that the following weaknesses need corrective action: 1) ensure that the procedures upgrade program incorporates procedure adherence categories, 2) provide more thorough training to give the craft a thorough understanding of the importance of procedure adherence and the program change in this area, and 3) resolve inconsistencies between SSES policy and procedural implementation policies at the lower tiers.





Response

To fully comply with Policy Letter 89-004 a significant number of current maintenance procedures must be revised. The procedure upgrade program is in progress and is incorporating procedural adherence levels. Although we had previously discussed using the PCAF process to effect the needed changes, we have decided to proceed with revising the procedures based on the Five Year Plan schedule. As part of this process, AD-QA-501 will be revised to conform to Policy Letter 89-004. Prior to the U2-4RIO, station wide pre-outage briefings were held with all personnel to stress the importance of procedural adherence. Pre-outage briefings have been used in the past and will continue in the future to emphasize, among other things, the importance of procedural adherence. OJT will be provided to craft personnel to provide understanding of the forthcoming revisions to AD-QA-501.

INADEQUATE REQUIREMENTS FOR MAINTENANCE PROCEDURES  
(Section 5.8, Page 52)

Weakness Summary

"Neither AD-QA-101 nor AD-QA-501 contain guidance on acceptable vocabulary, abbreviations, acronyms, or symbols, examples of items typically found in a procedure writer's guide. The lack of guidance in this area lends itself to inconsistent procedures among work groups."

Response

SSES procedure AD-QA-101 delineates the responsibilities for developing plant procedures and instructions, including the format to be used. Maintenance procedure AD-QA-501 amplifies these requirements and establishes standards for the development and review of Maintenance procedures. Attachment 'B' of AD-QA-501 "Writing Instructional Steps" gives guidance on writing Maintenance procedures; including:

- Criteria for the length of procedure steps
- Use of simple sentences
- Capitalization of specific words
- How words should be used
- How to use conditional statements
- How to handle lists
- Other writing and style guidance

The Maintenance Work Plan Standard, MI-PS-001, is used to standardize the development of work plans for work authorizations. This procedure gives guidance on what should be included in work plans and provides for consistency between plans and planners.



In addition, the I&C group is developing a Writer's Guide to standardize procedure writing. The Writer's Guide will address both style and content aspects of procedure writing. Completion of the guide is scheduled by the end of the second quarter, 1991. An I&C Planning Guideline is also being developed. The guideline will be used by planners to structure the development of work plans. This guideline is scheduled for issue during September, 1991.

**INADEQUATE PLANNING PROCESS**  
**(POST MAINTENANCE TESTING & ASME)**  
(Section 5.9, Page 53-54)

Weakness Summary

"The team concluded that improvements in WA planning are needed to ensure that ASME Code components are identified." Further, the team concluded that the process for determining Post Maintenance Testing (PMT) was difficult.

Response

The current process for identification of ASME Code components is difficult, however, it is performed by trained personnel. SEIS is used as the primary tool for code determinations. Design drawings and controlled documents are also used to make the determination; informational lists are used for guidance.

PMT requirements are identified through the planning function. MI-PS-008 (Post Maintenance Testing Guide) provides guidance on determining required PMT as a result of maintenance work. MI-PS-008 was recently revised (March 26, 1991) to clarify the process for determining testing requirements.

SEIS is being upgraded to improve and expand the level of information in the database. As more ASME information is included in the database, ASME determinations will become more systematic and less complicated.

A Maintenance Component Matrix is being developed which will identify operability PMT for Technical Specification related equipment.

The Preventive Maintenance Improvement Program (PMIP) is currently reviewing and revising the existing PM program at SSES. The intent of the PMIP effort is to use engineering evaluations to determine the prescribed maintenance for station equipment. As part of these evaluations the functional PMT requirements, for equipment worked under Preventive Maintenance Work Authorizations, will be reviewed and revised as necessary.



INADEQUATE WORK PACKAGE DOCUMENTATION  
(Section 5:10, Page 55)

Weakness Summary

The team reviewed completed work packages and noted a few minor documentation errors or omissions typical of which are the following examples. WA S94643 gave instructions for cleaning and inspecting the EDG E intercooler. End-bells were removed from this ASME Code component to replace numerous damaged studs. The WA "PMT Requirements" were listed as N/A; however, the "Action Taken" section of the work package indicated, "Performed inservice leak test (ISLT) found no leaks." The WA did not reference test data location, nor the procedure under which the test was performed. The ASME Code repair form attached to the WA indicated that "ISI NDE Requirements" included a visual test, but the test document was not a part of the work package. WA S04379 gave instructions for cleaning and inspecting the EDG jacket water pump (OP530B). Step F specifically required running the pump, collecting vibration data, and checking for proper operation. The work package contained no documented evidence that the vibration testing had been completed. These work packages failed to reference the required PMT or document completed tests. These two WAs indicate a need to improve work package documentation; this is considered a weakness.

Response

WA S94643-OE505E1 lists "N/A" for Post Maintenance Testing (PMT) requirements. The WA also states that the inner cooler will be cleaned, inspected, and eddy current tested, and references MT-GM-025, "Heat Exchanger Cleaning and Inspection." The "N/A for PMT" indicates that no additional testing over that referenced in procedure MT-GM-025 is required by this WA. The foreman recorded that he performed an ISLI (in service leak inspection). The ISLI was performed in accordance with Step 8.6.3 of MT-GM-025 which states, "Affected components should be inspected after several hours of wet service to check for leaks." This ISLI is a functional test to check for problems that could be associated with the maintenance activity. The foreman properly documented an inspection that was made in the ACTION TAKEN section of the WA. The ASME Code Repair Form calls for a VT-2 examination (identified 1/19/90) due to the replacement of several studs. Additional work instructions were written to cover this activity. The planning group prepared and sent to Operations an ERF Continuation Sheet for ERF A95526, indicating a VT-2 examination was required and identified the test as SE-054-301. The operability test, in accordance with our program, is not part of the work package. Based on the above, we do not believe this is an example of a work package which indicates a need to improve work package documentation.

We believe the observation made regarding WA S04379-OG501B/OP530B is incorrect. The problem description clearly describes the work to be done: "Clean and Inspect Jacket Water Circulating Pump OP530B. Rework if required. Work to be done during 18 month/5 year surveillance". The vibration checks for the Jacket Water Circulating Pump are included in



the 18 month surveillance activity work package. The shortfall in the package is that there is no reference to the activity number of the surveillance work activity (A01394). The lack of a specific activity number does not make the documentation non-traceable and indicative of a programmatic weakness.

INADEQUATE COMPONENT FAILURE TRENDING  
(Section 6.4, Page 61)

Weakness Summary

"System engineers are not required to trend component failures or operating parameters. Nor is there any mechanism to ensure that adverse component failure trends are detected when a component is utilized in several systems and ... may have ... an overall high failure rate ..."

Response

Susquehanna SES lacks an integrated component trending program which extends beyond system boundaries. The Equipment Performance & Trending Analysis report (EPTAR) provides for maintenance trending on a system and component basis. System trending is performed through matrices which contain WA occurrence and WA Manhour information. These two parameters are then compared to determine systems which are high in failure occurrence and require substantial Maintenance resources. Component based trending and analysis is performed in Reliability Engineering's Component Failure Analysis Report (CFAR) for NPRDS reportable systems. The CFAR is distributed separately and as an attachment to EPTAR.

Component level trending is also performed as part of predictive maintenance programs in maintenance. Several predictive maintenance and diagnostic programs have been established and the data is trended and analyzed.

Susquehanna is continuing to develop predictive maintenance programs in support of maintenance. Component trending is an aspect of all of the programs.

In conjunction with maintenance and the technical group, the operations department is developing an Operator Rounds Data Collector Project which will retrieve and trend component level data. The data from this project will be shared with maintenance and the technical group for use in component trending.

SSES will be expanding it's current component trending activities as more predictive/diagnostic programs come on-line. An integrated component trending program is a long term goal for Susquehanna.





INADEQUATE SEPARATION OF TOOLS  
(Section 7.3, Page 67)

Weakness Summary

Fixed-contaminated and non-contaminated tools were inadequately separated in the Turbine Building Tool Room (TBTR).

Response

The TBTR has been expanded to utilize the storage space in the spare SJAE rooms. Fixed contaminated tools and non-contaminated tools are not generally inter-mixed in the storage location. However, there is still a shortage of storage space. This is being addressed by further expansion of the TBTR to the south side of the central area on Elevation 676'. This expansion is planned for the third and fourth quarters of 1991.

NOTIFICATION OF EXPIRED M&TE  
(Section 7.4, Page 68)

Weakness Summary

"The M&TE program does not require that formal notice be sent to the M&TE user/supervisor upon expiration of calibration of a piece of M&TE."  
"The licensee stated that the program placed the responsibility on the user for ensuring that M&TE out of calibration is not used. The team considered the lack of special notification, indicating expired M&TE calibration, a weakness in the M&TE program."

Response

The M&TE program at SSES has been very successful. The last internal audit of the program found the program functioning well and identified no findings. Provisions of the program are in line with INPO good practice MA 303.

The program places the responsibility on the user to return M&TE which is scheduled for calibration. I&C Supervision is provided with a PMIS generated overdue list (PMAE 06) on a weekly basis to identify overdue M&TE. The program requirements are proceduralized in AD-QA-615. No changes to this aspect of the program are planned.

INADEQUATE JOB DESCRIPTIONS  
(Section 8.1)

Weakness Summary

Job descriptions for the new jobs created in the Susquehanna SES reorganization were unavailable during the inspection.



Response

AD-QA-500, "Conduct of Maintenance", Revision 11, issued August, 1990, contains a responsibility section which delineates the various maintenance job responsibilities. A separate job description document has been developed and is currently under review by Maintenance Management and is scheduled to be issued by June 1, 1991.

LACK OF CERTIFICATION  
(Section 8.2, Page 71)

Weakness Summary

Task certification is not available for complex tasks performed on an infrequent basis (HPCI turbine-overhaul, for example).

Response

Maintenance Training Certification Program

The Maintenance Certification Program is divided into three phases with each phase divided into two parts: Part A - Formal Training (OJT/Classroom) and Part B - Skills.

Phase I of the training is entry level training while Phase II of the training is a continuation of training leading to certification. Completion of both Phases I and II level sign-offs satisfies the requirements to fully certify an individual permitting the person to work independently or as a lead person. Phase III training involves specialized training for complex or unique plant equipment or components and builds on skills learned and demonstrated in Phases I and II. The intent of the process is to systematically evaluate personnel to ensure possession of minimum knowledge and skills to satisfactorily perform the duties of a certified individual and to ensure consistency in evaluation.

Assignment of Work:

Maintenance personnel who have not been evaluated as possessing minimum task competence may not work independent or be the lead person on installed systems and equipment at SSES. However, any person, regardless of training program status may perform tasks or procedures requiring evaluated skill provided they are under the direction of a person certified on that task, a factory representative, a foreman, or assistant foreman. Direction specifically means having one of the above either physically present or in frequent communication with the person performing the work to provide technical direction.



HPCI Turbine Work:

The HPCI turbine work observed during the inspection was the six-year overhaul of the turbine and was the first performance of that evolution at Susquehanna SES. The job was performed using the manufacturer's instruction/operating manual and with a vendor representative present on site. Because the evolution had not been performed previously at Susquehanna SES, the workers, although they possessed general skills and abilities, had no direct experience with the conduct of this evolution. Clearly, the level of performance on this evolution as noted in the NRC report did not satisfy our standards and improvements in procedures and specific task related training would mitigate the problems observed.

Corrective Actions:

During and following performance of the HPCI turbine overhaul, the production group tailboarded the activities and provided input to Maintenance Engineering for upgrading of procedure MT-052-002. That procedure has been upgraded to incorporate lessons learned and is being successfully used to conduct the overhaul of the Unit 2 HPCI turbine during the currently ongoing U2-4R10.

Our Mechanical Maintenance Certification Program (NTP-QA-45.2), has addressed specialized equipment training. Personnel who are not fully certified may be signed off on specialized equipment by successfully completing formal training, OJT training, and by evaluation on the task. The list of equipment and tasks covered by this training is provided on Form NTP-QA-45.2D. The HPCI turbine overhaul is not covered under this portion of the program and including it has been determined not to be appropriate.

Our decision not to include the HPCI turbine overhaul in the listing of specialized equipment and tasks is based on several factors. First, we believe our performance on the Unit 1 overhaul was primarily caused by a lack of adequately detailed procedures. Although specialized training for this first evolution would have improved our performance, we do not believe it will be necessary in the future. Performance of the first evolution resulted in significant procedural upgrades. With the Unit 2 overhaul currently taking place, the direct experience gained on the Unit 1 evolution is being taken advantage of. Upcoming overhauls will take place in six years when many more of our mechanical maintenance personnel will have achieved certification along with increased experience. Additionally, complex jobs are evaluated for justification of on-site vendor representation.



In general, we believe that the currently ongoing upgrading of our procedures program, the increasing number of certified personnel, the already adequate specialized training, and the presence of vendor representatives on jobs deemed to justify that representation is adequate to address performance of complex maintenance evolutions done on an infrequent basis.

### CONTROLS AND INSPECTIONS OF SCAFFOLD ERECTIONS

(Appendix A)

#### Weakness Summary

The inspector concluded that weaknesses existed in scaffolding construction and inspection. A potential personnel hazard existed because planks were not locked in place and the seismic adequacy of inspected scaffolds was questionable.

#### Response

PP&L Specification C-1056, Erection of Scaffolding in Safety Related Areas, and procedure AD-QA-903, Scaffold Erection Review Inspection, have been revised to provide scaffold inspection Qualified Engineer requirements and instructions for performing scaffold inspections. The Qualified Engineers will receive training on the erection and inspection of scaffolding. The specification and procedure now require all types of scaffold planks to be securely fastened to the scaffolding and that a maximum of two working levels of planking be used for any scaffold configuration. Any scaffold erection not covered by the procedure must now have approval obtained from Nuclear Plant Engineering prior to its use. These scaffold control enhancements further strengthen the scaffold erection/inspection program at SSES and address the areas of weakness identified by the inspection team.

