U.S. NUCLEAR REGULATORY COMMISSION REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE INSPECTION REPORT 50-387/85-99; 50-388/85-99 PENNSYLVANIA POWER AND LIGHT COMPANY SUSQUEHANNA STEAM ELECTRIC STATION ASSESSMENT PERIOD: FEBRUARY 1, 1984 - APRIL 30, 1985 BOARD MEETING DATE, JUNE 18, 1985

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A. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect the available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

An NRC Susquehanna SALP Board, composed of the staff members listed below, met on June 18, 1985, to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance". A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at the Susquehanna Steam Electric Station, Units 1 and 2 for the period February 1, 1984 through April 30, 1985. The summary findings and totals reflect the fifteen-month assessment period.

B. SALP Board Members

Chairman

R. W. Starostecki, Director, Divison of Reactor Projects (DRP)

Members

- S. D. Ebneter, Director, Division of Reactor Safety
- H. B. Kister, Chief, Project Branch No. 1, DRP
- J. M. Joyner, Chief, Nuclear Materials Safety and Safeguards Branch, DRSS
- L. H. Bettenhausen, Chief, Operations Branch, DRS
- J. R. Strosnider, Chief, Projects Section No. 1B, DRP
- R. H. Jacobs, Senior Resident Inspector, Susquehanna
- W. Butler, Chief, Licensing Branch No. 2, NRR
- M. J. Campagnone, Licensing Project Manager, LB No. 2, NRR

Other Attendees

- E. M. Kelly, Project Engineer, RPS1B, DRP
- L. R. Plisco, Resident Inspector, Susquehanna
- S. M. Peleschak, Summer Intern, DRP

C. <u>Background</u>

1. Licensee Activities

<u>Unit 1</u>

Unit 1 completed a 79 day outage to tie in common systems with Unit 2 and began operation on February 21, 1984. The unit operated with a 67 percent capacity factor (for 1984) until the start of the first refueling outage on February 9, 1985. There were seven unplanned automatic scrams and four forced outages during the assessment period with the unit shutdown for a total of about 50 days. Tables 6 and 7 summarize the unplanned automatic scrams and forced outages respectively.

Significant operating events that occurred during the period included two scrams in June and July 1984 caused by a loss of the T-10 startup transformer due to lightning strikes; a shutdown in October 1984 to replace scram pilot solenoid valve discs because four rods failed to scram during rod testing; and a shutdown due to a leaking containment isolation valve damaged by overpressurization of the nitrogen inerting line.

On February 9, 1985, Unit 1 began its first refueling outage scheduled to last 113 days. Major work during the outage included, Induction Heating Stress Improvement (IHSI) for reactor coolant piping, implementing about 160 modifications including installation of Regulatory Guide 1.97 instrumentation, replacement of RHR throttling valves and corrections to ESW waterhammer and single failure problems. During invessel inspection, the licensee determined that one of four steam dryer support brackets welded to the vessel wall was severely cracked. Evaluation and replacement of this bracket added about 15 days to the outage duration.

Unit 2

On March 23, 1984, the low power license for Unit 2 was issued and initial fuel load was completed April 13. On May 8, 1984, initial criticality was achieved and low power testing was completed on June 12. On June 27, the NRC issued the full power license and testing above 5 percent power was initiated.

On July 26, Unit 2 experienced a loss of all AC power during the performance of the loss of off-site power/load reject startup test which was performed from 30 percent power. The event was caused by a switch lineup error. Investigations of this incident were conducted until August 1 when the Unit was restarted. On September 28, Unit 2 achieved 100% power for the first time.

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On October 27, the precommercial outage was begun and lasted until January 5, 1985. Major work items included modification of the LPCI injection valves, IHSI, repair of a recirculation pump discharge valve, local leak rate testing, condensate demineralizer modifications and 18 month surveillance tests. The outage was completed nine days behind schedule, primarily due to unforseen problems with the LPCI injection valves. Following startup on January 5, 1985, Unit 2 operated near full power until April 30 with the exception of 4 short (one to three days) outages. The final major startup test, i.e., load reject from full power, was performed on January 29 and the warranty run performed between January 31 and February 9. On February 12, Unit 2 was declared in commercial operation. The unit operated at a 87 percent capacity factor since declared commerical.

During this SALP period, there were a total of eleven automatic scrams on Unit 2. Five of these scrams were planned for startup testing. Four of the unplanned scrams were the result of problems with the moisture separator drain tank level control system. Tables 6 and 7 summarize the unplanned automatic scrams and forced outages, respectively.

2. Inspection Activities

Two NRC resident inspectors were assigned to the site throughout the assessment period. The total NRC inspection hours for this 15 month period were 6572 (this equates to 5258 hours on an annual basis), with 3079 hours applied to Unit 1 and 3493 hours applied to Unit 2. The distribution of these inspection hours versus functional areas is shown in Table 2. A significant amount of inspection effort was devoted to verifying Unit 2 readiness for operation and monitoring the Startup Test program. The percentage of total inspection time devoted to a functional area is included at the heading of each area analyzed in Section IV.

Four special inspections (three resident and one team) were performed to follow up on operational events. These events included Unit 1 startup with HPCI inoperable in February 1984, fuel loading in Unit 2 in April 1984 with an inoperable source range monitor, loss of all AC power on Unit 2 in July 1984, and improper material in scram pilot solenoid valves in October 1984.

Four other team inspections were performed by region-based inspectors. These inspections involved assessing the post-accident sampling system in March 1984, observation of the annual emergency exercise in April 1984, Fire Protection/Safe Shutdown assessment in February 1985 and an operational inspection by an IE inspection team in February 1985.

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II. CRITERIA

Licensee performance is assessed in selected functional areas, depending whether the facility is in a construction, preoperational, or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area:

- 1. Management involvement and control in assuring quality
- 2. Approach to resolution of technical issues from a safety standpoint
- 3. Responsiveness to NRC initiatives
- 4. Enforcement history
- 5. Reporting and analysis of reportable events
- 6. Staffing (including management)
- 7. Training effectiveness and qualification

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definitions of these performance categories are:

<u>Category 1</u>. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety or construction is being achieved.

<u>Category 2</u>. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and reasonably effective so that satisfactory performance with respect to operational safety or construction is being achieved.

<u>Category 3</u>. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety or construction is being achieved. The SALP Board has also compared the licensee's performance during the last quarter of the assessment period to the overall performance for the entire SALP period. That comparison was used to trend licensee performance as "Improving", or "Consistent" (essentially the same), or "Declining".

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III. SUMMARY OF RESULTS

A. <u>Overall Facility Evaluation</u>

The station has completed the transition from construction and startup to operation. Competent management, exercising good control of actiities, continues to be a very positive attribute of this licensee. Licensee staff members are professional, maintain a positive attitude and are responsive to NRC concerns.

The previous assessment was characterized in part by operational incidents which involved violations of Technical Specification requirements. Operational incidents have continued to occur in this assessment period but at a decreasing frequency. In each case, the licensee took comprehensive action, such that similar events did not recur. A continued decrease in the number of operational incidents is expected as the operational staff gains experience and modifications are made to reduce equipment related problems. Strong management attention is necessary to continue this trend, particularly with the controls over systems common to both units.

Two areas where improvements are needed are the surveillance program and fire protection. The surveillance program, in general, is well established, and few operational problems are caused by improper performance of surveillance tests. The concern is with missed surveillances primarily caused by coordination problems between Operations and Chemistry, and administrative errors within the work groups.

Training and Quality Assurance are considered in the assessments of each functional area and specific aspects of these programs are addressed in the performance analysis of the functional area, as appropriate. An overview of these programs is provided below.

Training

The licensee's training program is strong in all areas.

The effectiveness of the training program is evidenced by the following: no failures in initial examination or requalification of licensed operators; relatively few operational incidents caused by instrument and maintenance technicians; only two unplanned automatic scrams caused by operator error; and improvements noted in the chemistry area.

Quality Assurance

The quality assurance/quality control department is well integrated into station programs and active QA/QC involvement has been noted in all areas. Involvement in the procurement process and the fifth diesel project has been particularly noteworthy. Audits in all areas are thorough and complete. Timeliness of NRC dispositions and responses to audit findings (previously noted to be a weakness) has improved with the implementation of tracking systems.

In summary, review of functional areas evaluated in this assessment indicates a licensee management approach that encourages conservatism, aggressiveness, openness, and a straight forward approach to problem resolution. Appropriate senior management involvement and interest in all areas is evident. Licensee staff is composed of professional, well qualified individuals guided by well-defined programs. There is technical depth in the support organizations and station departments generally work well together. The attributes are a major factor in the improvements noted in the overall plant operations area and the consistent high performance level in most other areas.

B. <u>Facility Performance</u>

<u>Func</u> A	<u>tional</u> rea	<u>Category</u> <u>Last Period</u> (February 1, 1983 - January 31. 1984)	<u>Category</u> <u>This Period</u> (February 1, 1984 April 30, 1985)	Recent Trend
1.	Plant Operation	ns 2	• 2	Improving
2.	Radiological Controls	2	1_	Improving
3.	Maintenance	1	1	Consistent
4.	Surveillance	2	2	Consistent
5.	Startup Testing	g 1	1	Consistent
6.	Fire Protection Housekeeping	1	2	Consistent
7.	Emergency Preparedness	1	1	Consistent
8.	Security and Safeguards	1	. 1	Consisțent
9.	Outage Manageme and Modificatic Activities	ent on NA	1	Not Determined
10.	Licensing	1	1	Consistent

IV. Performance Analysis

A. <u>Plant Operations</u> (44%, 2895 hours)

1. <u>Analysis</u>

This functional area was under continuous review by the resident inspectors and five resident inspectors from other sites inspected this area. In addition, a team of inspectors from IE headquarters performed an inspection in this area.

Management involvement and awareness of plant operations continues to be a strong attribute of licensee management. The licensee conducts daily management meetings during which the previous day's events are discussed. Management personnel are in the plant frequently. Senior management observed most major startup tests. Plant appearance has been excellent and reflects a strong commitment by management to maintain plant cleanliness and material condition. Other significant initiatives in the Operations area during this assessment period include efforts to reduce the backlog of temporary procedure changes, reduce the background noise level in the control room, reduce control room nuisance alarms, begin a major plant relabeling program and improve work group coordination. Management has established an Operations Enhancement program to manage the above and other improvements. The inspectors have observed improvements in these areas.

There have been several operational incidents which have been considered by NRC for escalated enforcement action. Two events resulted in civil penalties. These events are further described below. In each case, the licensee took thorough and extensive corrective action.

Early in the assessment period, two incidents occurred which highlighted a need for improved operator awareness of plant conditions and improved control of the shift turnover process and system lineups. The first incident was in February 1984 during a Unit 1 reactor startup when system lineups were not completely performed following the lengthy outage. The startup was not well controlled, which resulted in changing plant conditions with the HPCI system inoperable. In April 1984, during Unit 2 initial fuel loading, core alterations were performed in a core quadrant in which there was an inoperable source range monitor. Both of these incidents involved violations of Technical Specifications (TS) Limiting Conditions for Operation (LCO) and were discussed at enforcement conferences. The licensee now exercises tighter control of system status, and the shift turnover process has been improved. Shift briefings are conducted prior to relief, major evolutions are stopped during turnover, and operators perform control room board walkdowns with their reliefs.

In July 1984, a loss of all AC power occurred on Unit 2 during a startup test. The event was caused by a nonlicensed reactor building operator mispositioning four knife switches which deenergized control power for the 4KV busses. NRC and licensee investigation of this event revealed a number of issues. Four of these issues were classified as violations, the most significant of which involved the adequacy of the licensee's program of independent verification of activities that can affect operations and adequacy of corrective action for two previous occurrences involving mispositioning of the same knife switches. Although the incident was very significant, some positive attributes were noted. The control room licensed operator performance during event recovery was excellent and attributable to effectiveness classroom and simulator training and the extensive preparation for the startup test. The licensee performed an extensive investigation and implemented comprehensive and effective corrective action.

There is no single root cause for the above problems which resulted in operational incidents. They appear to be the result of lack of extensive experience on operating two new, highly complex power plants. A contributing factor may have been difficulty with interpreting standard technical specifications (the licensee recently formailzed a technical specification interpretation manual to help alleviate this problem). Each of the above problems highlighted weaknesses in the licensee's programs for which comprehensive corrective action was taken. The number of operational problems is decreasing as the operational staff gains experience and modifications are made to reduce equipment related problems. Nevertheless, an LCO concerning the operability of the ESW system was violated at the end of the assessment period. Review of this incident found that the operators did not aggressively pursue anomalies in equipment performance.

The licensee maintains a well qualified operating staff on a five shift rotation and is endeavoring to establish a sixth shift. The operating staff, including operations management, is more stabilized than in the previous assessment period. All operators are licensed on both units, and the majority of the staff had Unit 1 experience prior to the commencement of two unit operations. During inspector-observed transients, such as scrams and major startup tests, operators performed professionally and were well aware of the required actions.

The licensee has a very effective licensed operator training program. During NRC licensing examinations of 14 initial license candidates and 16 operators taking requalification exams, there

were no failures. No weaknesses were noted. Management's continued commitment to high quality training is evidenced by the construction of the new training center. After the assessment period, the licensee's training program became the first in the country to be accredited by INPO in all ten areas.

The licensee has established a very good internal incident reporting system. All occurrences meeting certain criteria, whether reportable to the NRC or not, require written responses from the appropriate work group evaluating the occurrence and addressing corrective actions. Responses are coordinated and evaluated by the compliance group and reviewed by the Plant Operations Review Committee (PORC). Periodically, management reports are generated addressing repetitive problems. This program has been effective in minimizing repeated mistakes and highlighting equipment problems. Licensee Event Report (LER) quality has also improved in this assessment period. Several LERs did require supplemental reports after inspector review, however.

Log keeping by licensed and nonlicensed operators is a weakness. Some improvement has been noted, but the problem still exists. On several occasions, inspectors have noted that on logs taken outside the control room numerous out of specification conditions are recorded and not red circled or explained as required by procedure. These logs are maintained by nonlicensed operators. The inspectors have frequently had difficulty performing a post event analysis due to inadequate or incomplete control room logs maintained by licensed operators. The Diesel Generator start log, required by licensee commitment to RG 1.108, has been found to have errors on several occasions during inspector review. The log has been recently reformatted and the entries have improved.

The licensee's program for conducting post reactor trip reviews was found to be thorough and effectively implemented. The program includes shift debriefings, review of various logs and computer printouts to determine proper operation of equipment, tracking of all scram open items, and PORC meetings to review open item status of all scrams prior to startup. A detailed summary report is later prepared by an STA for each scram.

QA/QC staffing levels are adequate to provide independent inspection and program overviews. The quality department provided shift coverage for the startup program and dedicated QA/QC personnel for overview of the fifth diesel project. Surveillance and audit reports are comprehensive. Nonconformance reports and audit findings are now tracked by a reporting system as corrrective action to a previous violation on overdue responses. The number of overdue responses has been significantly reduced, although reinspection of corrective actions revealed that a few NCRs had still not been dispositioned after more than a year. The Nuclear Safety Assessment Group (NSAG), which is the independent safety review group onsite, is performing its function in an excellent manner. The incidents and/or issues reviewed by the group are among the most important to safety and are reviewed promptly as evidenced by NRC inspectors and NSAG members after reviewing events at the same time. The reviews are extremely thorough and factual, and the recommended actions appear appropriate and well substantiated.

2. Conclusion

Rating: Category 2

Trend: Improving

3. Board Recommendations

Licensee:

Continue implementation of the Operations Enhancement Program. Improve log keeping practices.

NRC:

Continue routine inspection program. Schedule meeting to discuss Operations Enhancement Program.

B. <u>Radiological Controls</u> (12%, 818 hours)

1. <u>Analysis</u>

There were 12 inspections by radiation specialists. Areas inspected included the radiation protection program, chemistry program, effluent monitoring and control program, radioactive waste management and transportation programs, and preoperational and startup testing on Unit 2. Special inspections were performed to review licensee preparation for repair of a Unit 1 recirculation pump discharge valve; the post-accident sampling system; and licensee action following several spills of radioactive liquids. Resident inspection also periodically monitored radiological controls and chemistry activities.

The Radiological Controls Program at Susquehanna is common to both units and is uniformly implemented. The licensee maintains an adequate staff to implement the routine program and supplements the staff as necessary to support outages. In February 1985, the licensee established a position entitled Health Physics/Chemistry Supervisor and assigned an experienced manager to fill the position. An individual was also selected to fill the long-vacant Radiological Operations Supervisor position. These changes were made to strengthen the management oversight of the Health Physics and Chemistry staff. The licensee also upgraded the staffing in the radiation protection instrument control and calibration area in response to NRC and licensee identified deficiencies.

Selection, qualification and training programs for radiological controls, radioactive waste and chemistry are well defined and implemented. Training records are complete. The licensee lacks a well-defined training program for contractor technicians, however, although records review verified that individuals had been trained and qualified in appropriate procedures.

Licensee audits of the radiological controls program were thorough and complete, and audit findings are resolved in a timely manner. One minor violation was identified for using individuals who were not formally certified in the radioactive waste discipline to perform an audit in this area. This was due to an administrative oversight. The individuals were qualified but documentation was not available to certify this. The licensee took corrective action to prevent recurrence.

The licensee's external exposure control program is well defined and generally effective, although some minor problems were noted in the area of oversight of work in controlled areas. In one case, the inspector identified that the licensee was not routinely reviewing Instrument and Controls (I&C) work authorizations to establish radiation work permits (RWP). The inspector also noted that work was performed under RWPs without reference to the appropriate WAs in some cases. These are minor problems and not programmatic concerns. In each case, the licensee took prompt and appropriate action. In the area of the internal exposure control program, no deficiencies were noted. During a test of the licensee's whole body counting capability using the NRC phantom, the licensee was able to accurately quantify the nuclides contained in the phantom.

The licensee implements a strong ALARA program to minimize personnel exposures. A special inspection to review worker concerns relating to unnecessary exposure to repair the Unit 1 steam dryer did not substantiate the concerns. On the contrary, the licensee implemented strict exposure control for the dryer repair and utilized all appropriate means to minimize the exposure. Other examples of effective ALARA planning include practicing complex valve repairs on the uncontaminated Unit 2 recirculation pump discharge valve prior to performing actual work on the defective Unit 1 valve and using a full-scale undervessel mockup of a control rod drive (CRD) to train personnel in appropriate removal and installation procedures.

Review of the licensee's Radioactive Waste Management and Transportation program did not identify any significant or repetitive violations. The licensee has undertaken major programs to reduce the level of radioactive waste. Liquid releases were reduced by more than one half and solid waste shipments by about 10 percent in the past year. Similar goals have been established for 1985. State of Washington representatives identified an isolated problem with the licensee's bracing of a radioactive waste shipment. The licensee has strengthened Quality Assurance oversight and procedural controls in this area to preclude recurrence.

In the plant chemistry area, the licensee has made significant improvement since the previous assessment. A plant experienced engineer and additional chemists were assigned. A quality control program was formalized and formal technician training established. The licensee was able to provide acceptable results when asked to analyze NRC "spiked" samples. NRC's independent measurements of actual samples were in agreement with the licensee's results. Problems have continued with missed chemistry samples, however. A number of the missed samples were due to an individual (who is no longer with the licensee) not adhering to sampling requirements. Other missed samples were a result of coordination problems between chemistry and operations and are further described in the surveillance area. 2. Conclusion

Rating: Category 1

Trend: Improving

3. Board Recommendations

<u>Licensee</u>:

Implement formal contractor HP technician training program. NRC:

None.

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C. <u>Maintenance</u> (4%, 286 hours)

1. <u>Analysis</u>

Routine reviews of ongoing maintenance activities were performed by the resident inspectors. Two region-based inspections were conducted; one examining maintenance aspects of Generic Letter 83-28, Salem ATWS, and the other to review repair activities associated with a cracked steam dryer support bracket. No programmatic inspection of the maintenance program was conducted. No violations were identified in this area.

Instrument and Controls, Mechanical and Electrical Maintenance groups are well organized and staffed by experienced personnel. The administrative procedures governing the maintenance process are thorough and well understood. The maintenance group's practice of investigating corrective maintenance work authorizations (WAs) prior to initiating maintenance, enables preparation of more thorough and accurate work instructions and plans. Inspector review of work documents indicate that they are preplanned, contain specific work instructions and are properly classified.

The licensee utilizes an extensive computerized data capability to track maintenance activities. All WAs are coded with action taken, problem and cause codes. Summaries of the problem, action taken and manhours worked are extracted and maintained in the data base. All WAs are tracked in process (i.e., whether they are working, in QC review, being released by Operations, etc.). This capability enables the generation of many management reports including equipment history reports for trending.

The licensee's approach to maintenance is conservative and includes an appropriate level of management and engineering involvement. An example of this approach involved the replacement of a galled stem in a 28 inch recirculation system discharge valve on Unit 1 which could not be isolated from the vessel. The licensee performed extensive preparation and contingency planning for this evolution. These preparations included reviewing the evolution with another utility who had performed a similar repair, developing an operating procedure to address contingency actions if problems developed, manufacturing a special clamping rig to hold down the valve disk, and practicing the maintenance action first on Unit 2 (prior to initial fuel load). The maintenance action was completed without incident.

A similar approach was followed to repair a cracked steam dryer support bracket in the Unit 1 reactor vessel. A multidisciplined task force was established and a thorough, manpower-intensive review was performed to identify and resolve all technical issues

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. . involved in the repair. The licensee was unable to determine the cause of the cracking, so an instrumentation package was procured and installed on the steam dryer to determine if there is movement at power. Senior management was involved in all aspects of the repair.

A two week onsite IE inspection of station batteries revealed that the licensee's battery maintenance program did not conform to all requirements of IEEE 450-1975, to which the licensee was committed in the FSAR. The discrepancies included lack of specific criteria for terminating equalizer charges, not calculating the average of individual battery cell voltages, not trending intercell connector resistance measurements and no station procedures addressing battery maintenance. These discrepancies did not result in any batteries being inoperable. The licensee has corrected some of the discrepancies and is evaluating the remainder.

The licensee has established and implemented an extensive preventive maintenance (PM) program. The PM actions were developed based on vendor recommendations, equipment qualifi cation and company practices. The program is formalized and scheduling and tracking are computerized. The licensee is also evaluating the use of predictive maintenance tools such as vibration analysis and motor operated valve signatures to augment their PM program.

Procurement activities are well controlled and documented. To support plant maintenance PP&L has developed a computerized program that includes approved vendors, technical and QA requirements, and regulatory considerations for all spare and replacement parts. All purchase requisitions are reviewed by a technical review group and then by QA. Receipt inspections are well controlled and include detailed examination of documentation packages to ensure each item meets the technical requirements.

2. Conclusion

Rating: Category 1. Trend: Consistent

-3. Board Recommendations

Licensee - None.

NRC - None.

D. <u>Surveillance</u> (7%, 430 hours)

1. <u>Analysis</u>

Surveillance activities were routinely observed by the resident inspectors. The residents and an IE inspection team also reviewed the surveillance requirements associated with engineered safety feature (ESF) systems.

In general, the surveillance program is well established, using computerized schedules and technically adequate procedures. All surveillances performed less frequently than weekly are tracked by computer. Daily status summaries are provided to foremen and supervisors to track open surveillance items and management reports are generated to highlight surveillances not performed by the due date. Weekly and more frequent surveillances are manually tracked by each work group. A station surveillance coordinator was recently assigned to overview all aspects of the surveillance program.

In the previous assessment period, there were problems with missed surveillances and inadequate or lack of procedures. Procedure problems have generally been corrected. The trend of missed surveillances has continued, however. Twelve LERs describing missed surveillances were submitted during this assessment period, ten on Unit 1 and two on Unit 2. Causes of the missed surveillances include poor coordination between Operations and Chemistry and administrative errors within the work groups and the computer group. In general, the missed surveillances had little safety significance. They typically involved missed chemistry samples where followup samples identified no problems and surveillances completed shortly after the allowed period.

There were four violations identified in the surveillance area. Three of the violations concerned repetitive missed chemistry samples, fire detectors not surveilled, and four fire dampers in the Standby Gas Treatment System not surveilled. The remaining violation was issued for failing to identify that four control rods exceeded allowable rod scram times. This latter issue was discussed at an enforcement conference and is considered an isolated case of an inadequate review of surveillance results. The licensee took action to reformat the surveillance results and included additional reviews of control rod surveillances. Adequate corrective actions were also taken for the other violations.

Inspector review of the adequacy of surveillance procedures for various ESF systems did not identify any substantive discrepancies, with one exception. A two week onsite IE inspection identified that incorrect acceptance criteria were included in station battery quarterly surveillance and the five year battery test discharge surveillance did not conform to IEEE 450-1975 criteria for terminating the discharge. A review of past battery quarterly surveillances against the correct acceptance criteria did not reveal any failed surveillances. These discrepancies have been corrected.

2. <u>Conclusion</u>

Rating: Category 2

Trend: Consistent

3. <u>Recommendations</u>

<u>Licensee</u>: Increase attention to surveillance program controls at the work level to reduce frequency of missed surveillances.

NRC: None.

E. <u>Fire Protection/Housekeeping</u> (5%, 305 hours)

1. <u>Analysis</u>

This area received routine resident inspector coverage and routine region-based coverage during tours and walk-throughs of the facility throughout the assessment period. In addition, a programmatic inspection was performed by the resident inspectors, and an Appendix R safe shutdown inspection was performed by a region-based team.

Overall authority and responsibility for the administration of the Fire Protection Program rests with the Plant Superintendent. One full-time fire protection engineer (FPE) is onsite with the responsibility for coordinating the implementation of all aspects of the fire protection program. There is also a system engineer who has engineering responsibility for fire protection systems. The onsite FPE recently left the company, and the position is vacant. The licensee is taking action to fill the position.

Resident and region-based inspector reviews 'and plant tours found that reemphasis of the station policy concerning control and storage of combustible materials is needed. During a plant tour, a violation was identified when approximately 15 compressed gas cylinders were found stored in an unauthorized location, next to and physically tied to the safety-related MSIV-LCS. A similar finding had been identified by the licensee's NQA department in a previous audit, but corrective action was insufficient to prevent recurrence. The amounts of combustible materials allowed in safety-related areas are not procedurally limited or adequately minimized, and the station administrative controls are weak and not strictly followed. Although no single plant area contained an excessive amount of combustible material which would significantly increase the area fire loadings, several instances of unattended combustibles and unapproved combustible storage were identified during plant tours.

The various section heads are responsible for performing the surveillance testing on fire protection systems; and, in general, the testing is well controlled and documented. One violation was identified in that the licensee did not include all of the required fire detection instruments in the applicable surveillance tests. Twelve fire zones were omitted from the periodic testing due to an administrative error in the tracking system. In addition, a region-based inspection found that fire dampers in walls of the turbine building (non-safety-related) were not periodically tested as required by NFPA codes. These are additional examples of the problems identified in the overall control of surveillance testing discussed in the Surveillance analysis (Section IV.D) of this report.

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There were six LERs during the assessment period concerning uninstalled fire barriers and/or fire watches which were not performed. The majority of the deficiencies were involved with modification installation. The missed fire watches were caused by administrative errors. Additionally, deficiencies were identified with associated surveillance procedures. The licensee has revised the administrative controls for fire watch assignment, and the fire barrier/penetration surveillance procedures.

The fire brigade is composed of operations and security personnel and staffing is adequate. A review of fire brigade training indicated that the program was well defined and the required training was being conducted. All members receive valuable practical training at the Harwood Fire School on an annual basis. One violation was identified where four individuals were assigned to the fire brigade without completing all of the required training, due to administrative errors. The members were removed from the brigade until their training was completed.

The licensee has experienced difficulties in providing adequate resolution to the NRC concerning the safe shutdown capability. During the special Appendix R inspection eight unresolved items were identified where the licensee could not demonstrate compliance to Section III.G (safe shutdown) of Appendix R. The inspectors found the Fire Hazards Analysis Report was not based on a fire area concept as specified by Appendix R, but, instead, based on a fire zone concept. The numerous deficiencies can be, in part, attributed to the licensee not aggressively obtaining the needed clarification following the Appendis R workshops during April 1984. Specifically, clarification was provided at the workshops for deficiencies similar to those identified at Susquehanna.

Several management meetings were held at NRC headquarters to discuss the concerns, and a followup NRC audit was conducted to resolve the discrepancies. Following the audits and meetings, the licensee agreed to respond to the staff's concerns formally in the near future and submit a proposed schedule for corrective action to the staff. The licensee also established interim' compensatory measures consisting of a hourly fire watch patrol in accessible areas of the Unit 1 and 2 reactor buildings pending resolution of the unresolved items.

Susquehanna's high standard of cleanliness has been consistently maintained throughout the period due to good housekeeping practices and a strong management commitment to an effective housekeeping program. Minimal graffiti mainly remnants of the recently completed construction programis evident. Work activities are generally cleaned up thoroughly after job completion. Accountability has been established and accepted at all levels for maintaining the required overall plant cleanliness. Monthly inspections are conducted by a specified team which includes management members. Formal procedures have been established which specify housekeeping requirements for various plant areas and responsibilities for cleanliness in those areas. Management has made a significant commitment of resources aimed at plant cleanliness, and the plant reflects it. Several plant visits by other resident inspectors and Region I management have found in-plant housekeeping excellent. A station policy exists concerning management inspection of the facilities whereby the Duty Manager tours the station at least once per week during off-normal work hours and reports the results to the Station Superintendent. The high level of cleanliness is considered to have contributed to minimizing fire hazards and strengthened employee morale and pride.

2. Conclusion

Rating: Category 2

Trend: Consistent

3. Board Recommendation:

Licensee:

Management attention is required to demonstrate compliance with III.G of Appendix R. Strengthen controls over combustible materials.

NRC:

None.

F. <u>Emergency Preparedness</u> (5%, 335 hours)

1. <u>Analysis</u>

During the assessment period, there were five region-based inspections of the emergency preparedness program, including observation of a partial and a full participation exercise.

• The licensee has committed substantial resources to the emergency preparedness program. A full-time staff of seven individuals implements the program as compared to an average of four at other Region I stations. The licensee's emergency facilities, particularly the EOF, are impressive; exercise participants are well qualified, and management and staff are genuinely interested in performing well in emergency exercises. This attitude and commitment of resources is reflected in the licensee's high level of performance during inspector observed exercises. Relatively few deficiencies have been identified in the emergency exercises.

The licensee is responsive to NRC initiatives in all areas. Exercise scenario packages are organized and comprehensive and submitted in a timely manner. Deficiencies are remedied promptly and efforts are made to demonstrate the effectiveness of corrective actions during subsequent exercises.

One minor violation was identified which involved training deficiencies for two individuals. This deficiency was corrected and all other emergency response personnel had received all required training.

2. <u>Conclusion</u>:

Rating: Category 1

Trend: Consistent

3. <u>Recommendations</u>:

Licensee:

None.

NRC:

Reduce inspection effort.

G. <u>Security and Safeguards</u> (2%, 117 hours)

1. Analysis

During this assessment period, there were two unannounced physical protection inspections performed by region-based inspectors. One of these inspections was conducted during a maintenance outage. In addition, there was one unannounced material control and accounting inspection performed by a region-based inspector.

The licensee has been effective in maintaining a high degree of overall security performance. Management of the security program is effective. The program is divided functionally, and an experienced supervisor is responsible for each function. The type of functional structure used by the licensee is considered to be one of the primary contributors to the highly successful program at Susquehanna.

The licensee's annual audit of the security program, which was conducted by licensee organizational units independent of security, was comprehensive and resulted in four findings: one involving contingency procedures and practices; two involving the routine conduct of security activities; and one concerning the storage of safeguards information. Corrective actions were prompt, were verified by Nuclear Quality Assurance auditors and appear to be effective as evidenced by the absence of problems in the security area.

Resident inspection identified one violation for issuing a security badge to the wrong individual. Licensee investigation and corrective action for this incident was prompt and comprehensive. Improved control of badge issuance has been noted.

There were no events that required reporting pursuant to 10 CFR 73.71 during this assessment period. The licensee provided timely and appropriate compensatory security measures whenever security events occurred.

The licensee provided a prompt and definitive response to Region I concerns relative to ensuring that NRC inspectors have prompt and unfettered access to the site. The licensee's actions minimized inspector access delays.

2. Conclusion

Rating: Category 1

Trend: Consistent

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3. <u>Recommendation</u>

<u>Licensee</u>:

None

<u>NRC</u>:

Increase reliance on resident inspections to provide inspection coverage.

H. <u>Outage Management and Modification Activities</u> (6%, 422 hours)

1. <u>Analysis</u>

Routine resident inspection addressed outage activities. Modifications (including the fifth diesel project) were examined in six region-based inspections. No violations were identified.

Outage Management

The licensee performed two major outages during this assessment period. The precommercial outage on Unit 2 was performed from October 1984 to January 1985 and the Unit 1 first refueling outage was performed from February to June 1985. The licensee has established an outage management organization responsible for planning, prioritizing and coordinating outage work. Outage preparations were extensive. Most outage work packages were prepared prior to the start of the outages. For the Unit 1 refueling outage, the licensee removed several operators from their shift to review and prepare blocking for the work packages, relieving on shift operators of this burden. The licensee held outage scheduling/coordinating meetings twice a day and detailed outage schedules were generated daily. Management was constantly aware of critical path activities and able to appropriately prioritize work. As a result of detailed planning and management oversight, outage work proceeded smoothly and, with the exception of unanticipated work items, was completed close to the original schedules.

Modifications

The licensee has established a strong nuclear design organization in PP&L corporate headquarters. The design change process and drawing control are now completely controlled by the licensee without reliance on the architect engineer. This is a significant accomplishment by the engineering organization at an early period in plant life.

The design change process is well controlled by detailed pro cedures and managed by a well qualified engineering staff. Design reviews are multi-faceted, with evidence of interface between disciplines, consultants, NQA, plant staff and management. In addition to the required independent design verification, the licensee has established a Design Review Board, composed of senior engineers and managers, to review major modifications.

Class 1 drawings (those used in day-to-day plant operations) are updated quickly to reflect modifications. The resident inspectors have noted occasional inaccuracies in a number of Class 1 drawings, however. The inaccuracies are generally minor, (i.e. incorrect drawings not matching procedures with respect to etc.) are promptly corrected and do not appear to be a configuration control problem. Regional inspection found evidence of configuration control problems with Class 2 connection and wiring diagrams for internal cabinet terminations. Class 2 drawings are those used to support maintenance or modification. No correlation has been made to operational problems as a result of drawing inaccuracies.

The licensee is installing a fifth diesel generator to serve as a backup to the four existing emergency diesel generators. Construction of the diesel building to house the fifth diesel was followed closely by a regional specialist. Management involvement in preconstruction, planning and coordination of this project was evident. Authorities, responsibilities and organizational interfaces of the contractor, AE and PP&L are defined in an Operational Policy Statement which is the QA plan for this project. The licensee is providing strong control of the project. Licensee QA audits identified QC documentation and QA staffing concerns with the construction contractor. Documentation problems were immediately corrected and the contractor added the necessary QA/QC personnel to prevent recurrence. PP&L QA/QC involvement has also increased.

2. Conclusions

Rating: Category 1

Trend: Consistent

3. <u>Recommendations</u>

Licensee:

Meet with NRC Region I to discuss outage planning prior to refueling outages.

NRC:

Conduct inspections of engineering support effort at corporate office prior to refueling outages.

I. <u>Startup Testing</u> (15%, 964 hours)

The Unit 2 startup testing program was conducted during this assessment period. Sixteen region-based inspections were performed, including a special team inspection to investigate the loss of AC power event in July 1984. Resident inspection also addressed this area.

The startup program was performed between March 1984 and February 1985. A startup organization was formed and five shift teams were established to perform the testing. Each shift was composed of test engineers from plant technical staff, GE and Nuclear Plant Engineering (NPE). The individuals were well trained, the staffing levels were ample, coordination was maintained with Operations, and there was good management oversight. These aspects greatly contributed to a smoothly run test program.

The licensee's approach to testing was conservative and safety conscious. Procedures were detailed, briefings were conducted prior to each test and test results review was timely. Tests were repeated if the results were questionable, whether or not acceptance criteria were met. Test exceptions were adequately resolved.

In July 1984, a loss of all AC power occurred during the performance of ST 31.1, Generator Load Reject with Loss of Offsite Power. An improper lineup of four DC knife switches prevented all four diesel generators from starting. As a result of an NRC investigation, four violations were issued for inadequate independent verification process, inadequate corrective action for two previous occurrences involving the knife switches and deficiencies in operator training and the test procedure. The investigation also determined that the preparations for the test were extensive and operator response was excellent. This event is considered most relevant to plant operations and was factored into the assessment of that area.

During the startup testing program for Unit 2, there were six unplanned scrams, which compares favorably with 13 unplanned scrams during the test program on Unit 1. This number is much less than industry average during startup testing. In addition, the number of test exceptions and test change notices required for Unit 2 were less than one-half of those prepared on Unit 1. These faborable results reflect effective use of startup and operational experience gained in Unit 1.

In general, test results review was thorough and adequate. Near the end of the startup program, however, an inspector identified and issued a violation for two examples of inadequate review of test results. The test results were reevaluated. 2. <u>Conclusion</u>

Rating: Category 1

Trend: Consistent

3. <u>Board Recommendation</u>

Licensee:

None.

NRC:

None. This area will not be reviewed in the future, and related activities will be assessed in the outage management area.

J. <u>Licensing Activities</u>

1. <u>Analysis</u>

During the assessment period, the low power and full power licenses were issued on Unit 2. Supplements 6 and 7 to the NRC's Safety Evaluation Report (SER) were issued to support Unit 2 licensing. The NRC staff also issued 10 license amendments to the Unit 2 license and 22 amendments to the Unit 1 license. Two amendments were processed under emergency conditions. In each case, the staff concluded that the emergency condition could not be avoided. The staff was also involved with the Fire Protection/Safe Shutdown audit and review of a major repair to the steam dryer support bracket in the Unit 1 reactor vessel.

The licensee continues to demonstrate a high degree of management involvement in the resolution of licensing issues. Management participates in site reviews and audits with a positive attitude and willingness to cooperate. Most licensing amendment requests reflect adequate evidence of prior planning necessary to support licensing activity schedules. Additionally PP&L management staff level review has been adequate. When necessary PP&L has provided the NRC with additional support necessary to expedite reviews of proposed amendments. During the first refueling outage, management support for licensing activities appeared somewhat strained. The licensee should evaluate more closely the necessity of and scheduling of amendment requests. Some amendment requests are not submitted sufficiently in advance of the need for the amendment and required expedited NRC review.

The licensee has demonstrated a clear understanding of technical issues applicable to licensing activities. The licensee has, in some instances, submitted information that is not as complete as expected, but, upon request, has adequately supplemented this information. The need to request additional information does not reflect a lack of knowledge of the issue but a lack of complete documentation of information. Safety analyses supporting the amendment requests do not always address all issues. PP&L should strive to improve the completeness of the information submitted to the staff so as to avoid unnecessary time and effort expended on obtaining additional information. The licensee has proven to be responsible and competent in resolving technical issues from a safety standpoint. PP&L's licensing staff is technically knowledgeable and exceptionally sensitive to safety concerns.

The licensee often initiates meetings with the NRC staff to assist with staff understanding of complex issues. The licensee

is always well prepared, presentations are comprehensive and the licensee is able to adequately address staff questions. This process has assisted with staff review of amendment requests.

A concern with accuracy of information provided to the NRC on two occasions was identified by the resident inspectors late in the assessment period. The inaccuracies were caused by inadequate technical review by licensee engineers. The information was promptly corrected, and the licensee is reinforcing internal review procedures to minimize these occurrences.

2. Conclusion

Rating: Category 1

Trend: Consistent

3. <u>Recommendations</u>:

Licensee:

Ensure completeness of initial submittal of amendment requests.

NRC:

None

V. Supporting Data and Summaries

A. Investigations and Allegations Review

Two allegations received during the previous SALP period were found to be unsubstantiated and were closed. The two allegations involved the adequacy of BISCO pressure seals for piping penetrations and that a termination whole body count was not performed.

Eight allegations were received during this SALP period. One allegation concerning chugging loads was evaluated by NRR and closed by a safety evaluation dated April 11, 1985. The remaining seven allegations are still under evaluation.

B. <u>Escalated</u> Enforcement Actions

1. <u>Civil Penalties</u>

- a. A \$75,000 civil penalty was imposed on July 6, 1984, for an inoperable Source Range Monitor during Unit 2 fuel loading on April 10, 1984.
- b. A \$50,000 civil penalty was imposed on December 18, 1984, for the loss of all Unit 2 low pressure Emergency Core Cooling Systems during a loss of AC power event on July 26, 1984.
- 2. <u>Orders</u>
 - a. Confirmatory Order dated June 14, 1984, on commitments for emergency response capability.
 - b. Confirmatory Order dated July 27, 1984, on licensee actions relating to the Unit 2 loss of all AC power event.
- 3. <u>Confirmatory Action Letter</u>
 - a. Confirmatory Action Letter dated July 26, 1984, relating to the Unit 2 loss of all AC power event.
 - b. Confirmatory Action Letter dated October 17, 1984, relating to the scram pilot solenoid valve failures.
- C. Management Conferences Held During the Assessment Period
 - 1. <u>March 20, 1984</u> Enforcement Conference at NRC Region I on <u>HPCI/RCIC</u> inoperability during Unit 1 startup.
 - 2. <u>May 7, 1984</u> Enforcement Conference at NRC Region I on inoperable SRM during Unit 2 fuel loading.

- 3. <u>May 21, 1984</u> SALP Management Meeting at SSES.
- 4. <u>May 31, 1984</u> Management Meeting at NRC Region I on Unit 2 power transient during low power testing.
- 5. October 9, 1984 Enforcement Conference at NRC Region I on loss of AC power event.
- 6. <u>January 10, 1985</u> Enforcement Conference at NRC Region I on scram pilot solenoid valve failures.
- D. Licensee Event Reports (LER's)

Tabular Listing

Type of Events:

Α.	Personnel Error		38
Β.	Design/Man./Constr./Install		28
C.	External Cause		4
D.	Defective Procedure		7
Ε.	Component Failure		. 1
х.	Other	•	_24
ŕ		TOTAL	102

<u>Causal Analysis</u>

Six common causal chains were identified:

(a) <u>SGTS Start on Refueling Floor High Radiation Signal:</u>

Three LER's (387/85-01, 85-10 and 85-11) describe four automatic starts of the SGTS and CREOASS initiated by the Refuel Floor High Exhaust radiation monitors during outage-related activities. One occurrence was during movement of the Unit 1 steam dryer, one was received during vessel draining activities, and two occurred during radiography on the refuel floor. The initiations were all caused by a high radiation field in the area of the detector and not by high airborne activity in the exhaust duct. Station particulate, iodine and noble gas monitors showed no abnormal release rates. These type of initiations have occurred pre-viously, and the licensee is investigating possible corrective actions. Several procedural changes 学本哲学 . • •

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have already been implemented, including the use of jumpers during steam dryer movement.

(b) <u>High Moisture Separator Drain Tank Level</u>

Two LERs (388/84-17 and 84-21) describe three Unit 2 reactor scrams caused by High Moisture Separator Drain Tank Level. Two scrams occurred during Combined Intermediate Valve testing, and one scram occurred during reactor feedpump testing. Licensee investigation found that the drain valve in the crossaround piping had malfunctioned, the moisture separator drain tank level control system was not adequately responding, and a considerable volume of water had accumulated in the crossaround piping. The piping was drained, the drain valve repaired, and the control system adjusted. A task force was established and recommended procedure changes and a modification which was subsequently installed. The problem has not recurred.

(c) <u>SBLC Sodium Pentaborate Concentration</u>

Three LERs (387/84-23, 84-30, and 388/84-24) describe three occurrences when routine surveillance testing of the standby liquid control system sodium pentaborate solution found the concentration out of the Technical Specification range. The licensee established a more conservative administrative concentration limit and instituted a bi-monthly check of solution concentration. The licensee has also instituted procedural changes and is evaluating possible modifications and a Technical Specification Change. The problem has not recurred since October 1984.

(d) <u>Surveillance Testing</u>

Fifteen LERs (387/84-12, 84-16, 84-25, 84-27, 84-32, 84-38, 84-41, 84-42, 84-45, 85-05, 85-06, 85-12, 85-16; 388/84-16 and 85-05) describe events concerning missed surveillances and/or inadequate surveillance procedures. This area was addressed in the last SALP, where it was also a common chain and is discussed in detail in section IV.D.

(e) <u>Electrical System Transients</u>

Six LERs (387/84-14, 84-28, 84-29, 84-34, 84-43 and 85-03) describe four reactor scrams and two ESF actuations caused by electrical system transients. Two scrams were caused by lightning strikes on the 230 KV transmission line which caused a loss of T-10. The remaining scrams were caused by transmission line sag into a tree and ice formation in an auxiliary transformer bus duct. The licensee has performed modifications to minimize the plant response to major electrical transients.

(f) <u>Fire Protection</u>

Six LERs (387/84-21, 84-46, 85-15; 388/84-23, 84-26 and 84-27) describe events concerning uninstalled fire barriers and/or fire watches which were not performed as required. The majority of the fire barrier deficiencies were involved with modification installation. The missed fire watches were due to administrative errors. Several of the LERs also identified deficiencies with the fire barrier/penetration surveillance procedures.

(g) Diesel Generator Trips

Three LERs (387/84-40, 85-02 and 85-04) and 10 special reports describe diesel generator trips during conduct of the surveillance testing. During the SALP period, over 30 diesel trips occurred due to various causes. At one time during the period, the surveillance frequency was increased from monthly to every three days since five (5) valid failures had occurred in the previous 100 valid starts. This causal chain was identified during the last SALP and the licensee has directed increased management attention to correcting the problems, especially the large number of non-valid failures.

(h) <u>System Inoperability and Inadvertent Initiation Due to Modifi-</u> <u>cations</u>

Six LERs (387/85-08, 85-14; 388/84-12, 85-02, 85-08, and 85-15) describe events where safety systems were made inoperable and/or inadvertent ESF actuations were caused by modification work activities. Examples include Core Spray inoperability due to incorrect fuse removal and ESW loop inoperability due to incorrect opening of sliding links. Three ESF actuations were caused by shorting/grounding incidents where metal tools made inadvertent contact inside electrical panels. The licensee had made some administrative control changes to prevent recurrence.

Review of Previous SALP Causal Chains:

- (a) <u>Reactor Mode Switch</u>: The reactor mode switch has been replaced on both units and the failures have not recurred.
- (b) <u>RCIC Turbine Overspeeding</u>: The licensee has taken significant corrective action and refurbished the EGR actuator. The actions appear to have resolved the frequent overspeed trip problems.
- (c) <u>Barton Model 288A Level Instrument Drift</u>: Only one LER was submitted during this SALP period (388/85-09) that involved Barton instrument drift. The licensee has taken corrective action and is continuing to reevaluate the drifting problems.

- (d) <u>Diesel Generator Trips</u>: These occurrences have continued during this SALP period, and the licensee has placed increased attention to correct the trend.
- (e) <u>Missed Surveillances</u>: These occurrences have continued during this SALP period; and, although the licensee has taken some cor rective action, the number of occurrences has increased.
- (f) <u>Chlorine Detector Wick</u>: The number of occurrences due to this problem have decreased due to licensee corrective action. Additionally, it is no longer reportable under the new LER reporting system.

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TABLE 1

TABLULAR LISTING OF LERS BY FUNCTIONAL AREA

SUSQUEHANNA STEAM ELECTRIC STATION

	Area		Cause Code					
		А	В	С	D	Ε	Х	Total
<u>A.</u>	Plant Operations	11	14	4	3	1	12	45
<u>B.</u>	Radiological Controls	1_	1		2		6	10
<u>c.</u>	Maintenance	2	2			۰	3	7
<u>D.</u>	Surveillance	17	2		2		1	22
Ε.	Fire Protection/ Housekeeping	1	5				, ,	6
<u>F.</u>	Emergency Preparedness							-
<u>G.</u>	Security and Safeguards		<u> </u>				····	
Н.	Outage Management and Modification Activities	4	2				1	7
<u>I.</u>	Startup Testing	2	2				1	5
<u>J.</u>	Licensing Activities						-	
	Totals	38	28	4	7	1	24	102

Cause Codes:

- A. Personnel Error
 B. Design, Manufacturing, Construction, or Installation Error
 C. External Cause
 D. Defective Procedure

- E. Component Failure
- X. Other

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TABLE 2

INSPECTION HOURS SUMMARY (2/1/84 - 4/30/85)

SUSQUEHANNA STEAM ELECTRIC STATION

		Hours	<u>% of Time</u>
Α.	Plant Operations	2895	44
Β.	Radiological Controls 🎝	818	12
C.	Maintenance	286 `	4
D.	Surveillance	430	7
E.	Fire Protection/Housekeeping	305	5
F.	Emergency Preparedness	335	5
G.	Security and Safeguards	117	2
Н.	Outage Management and Modification Activities	422	- 6
I.	Startup Testing	964	15
J.	Licensing Activities	*.	*
	Total	6572	100

*Hours expended in facility license activities and operator license activities not included with direct inspection effort statistics.

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TABLE 3

VIOLATION SUMMARY (2/1/84 - 4/30/85)

SUSQUEHANNA STEAM ELECTRIC STATION

A. <u>Number and Severity Level of Violations</u>

Severity Level	I	0
Severity Level	II	0
Severity Level	III	2
Severity Level	IV	. 16
Severity Level	V	6
Deviation		_3
		27

B. <u>Violation Vs. Functional Area</u>

			S	everit	y Lev:	els	
FUN	CTIONAL AREAS	I	II	III	IV	<u> </u>	DEV
<u>A.</u>	Plant Operations	0	0 '	2	3	1	1
<u>B.</u>	Radiological Controls	0	0	0	3	3	0
<u>C.</u>	Maintenance	0	0	0	0	0	0
<u>D.</u>	Surveillance	0	0	0	4	1	0
<u>E.</u>	Fire Protection & Housekeeping	0	0	0	4	0	1
<u>F.</u>	Emergency Preparedness	0	0	0	1	0	0
<u>G.</u>	Security Safeguards	0	0	0	1	0	0
<u>H.</u>	Refueling & Outage Management	0	0	0	0	0	0
<u>I.</u>	Startup Testing	0	0	0	0	1	1
<u>J.</u>	Licensing Activities	0 -	0	0	0	0	0
•	Totals	0	0	2	16	6	3
	- 3						

C. <u>Summary - Enforcement Data</u>

Inspection Report No.	Inspection Date	Severity _Level	Functional Area	<u>Violation</u>
387/84-05	1/30-2/3/84	V	RADCON	Improper setting on Gas Flow Proportional Counter
387/84-07	1/31-3/31/84	IV	RADCON	Service water radioactivity monitor alarm setpoints not set conservatively
		IV ^x	RADCON	Personnel radiation protec- tion procedures not followed
387/84-09	2/14-17/84	IV	RADCON	Inspector not properly certified
387/84-11	2/21-24/84	ÍV	OPS	Changing operational conditions with HPCI Inoperable
388/84-12	3/5-4/2/84	DEV	* STARTUP	Vacuum breaker testing does not meet FSAR commit- ment
387/84-14	4/1-5/7/84	V	OPS	Manual containment isolation valves
388/84-19	4/10-11/84	III,\$75K CP	OPS	Fuel loading with inoperable SRM in affected quadrant
387/84-18	5/8-6/8/84	IV	OPS	Secondary contain- ment penetrations not aligned
388/84-22	5/8-6/8/84	IV	OPS .	RCIC system not aligned for automatic operation

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Inspection Report No.	Inspection Date	Severity Level	Functional Area	Violation
387/84-22	6/9-7/15/84	IV	SURV	RHR Service Water effluent grab sample not obtained
387/84-22	6/9-7/15/84	IV	SURV	Fire detectors surveillance not performed
387/84-27	7/30-8/2/84	IV	EP	Emergency Support Staff Training not completed
388/84-34	7/26-41/84	*	OPS	Inadequate corrective action for previously experienced problems
•		*	OPS	Inadequate independent verification of rack out activities
		*	OPS	Inadequate procedures to establish initial conditions
м ,		*	OPS	Inadequate training
	,	DEV	OPS	Inoperable safety circuits not annunciated
387/84-31; 388/84-37	6/27/84	V	RADCON	Bracing not provided on shipment of radwaste
387/84-34; 388/84-41	9/15-11/6/84	IV	SEC	 Unauthorized entry into protected area

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Inspection <u>Report No.</u>	Inspection Date	Severity Level		Functional Area	Violation
388/84-42	10/2-5/84	V		SURV	Surveillance procedures regarding recirculation pump trip instru- mentation not complete
387/84–35	10/13-22/84	IV		SURV	Failed surveil- lance on rod scram timing not identified
387/84-38; 388/84-47	11/7/84-1/6/85	IV	٠	FP	Inadequate control of combustible gas cylinders
		IV		FP	Incomplete fire brigade training
387/85-06; 388/85-06	2/11-15/85	IV		FP	Fire dampers not tested in accor- dance with NFPA
		IV		FP	Fire doors not maintained as fire barriers
	· .	DEV		FP	Licensee did not perform duct failure analysis
388/85-02	1/8-10/85	V ·		STARTUP	Failure to analyze test results in accordance with administrative procedure requirements
388/85-07	2/17-22/85	V		RADCON	Breathing air not tagged as required
387/85-12	3/23-5/5/85	IV		SURV	Fire dampers in SGTS not surveilled

*Violations issued as Severity Level III in aggregate, \$50,000 CP.

TABLE 4

INSPECTION REPORT ACTIVITIES (2/1/84 - 4/30/85)

SUSQUEHANNA STEAM ELECTRIC STATION

Inspection Unit 1	<u>Report No.</u> Unit 2	<u>Inspecti</u> Unit 1	ion Hours Unit 2	Areas Inspected
84-05	84-06	72	72	Radioactive Waste Pro- gram
	84-07		78	Preoperational and Startup Test Program
84-07	84-08	284	276	Routine Resident
84-08	84-09	5	5	Piping system design descrepancy
84-09		24		Transportation activities
	84-10		60	Physical Security
84-10	84-11	90	90	NUREG 0737 Radiation Monitoring. Post Accident Sampling
84-11		72		Special Resident Inspection; Valve lineups
84-11 EC	•	25		Enforcement Conference
	84-12		141	Preoperational and Startup Test Program
84-12	84-13	10	10	Review of open electri- cal inspection items
84-13	84-15	27	28	Radiation Protection, ALARA, outstanding in- spection items
84-14	84-16	107	190	Routine Resident

T4-1

T4-2

Inspection	Report No.	Inspectio	n Hours	
Unit 1	Unit 2	Unit 1	Unit 2	Areas Inspected
84-15		214		Emergency Preparedness; Observation of Emergency Drill
84-16	84-14	12	12	Radioactive Waste Pro- gram
84–17	84-17	2	12	Material Control and Accounting
·	84-18		134	Initial Fuel Load, Startup Test Program
	84-19		23	Special Resident Inspection; inoper- ability of source range monitor during core al terations
	84-19 EC	v	20	Enforcement Conference
	84-21		41	Startup Test Program
84-18	84-22	67	154	Routine Resident
	84-23		80	Preoperational and Startup Test Program
84-19		27		Emergency Preparedness
84-20	84-24	4	4	Post Accident Sampling
	84-25	Mgmt. Me	eeting	May 28, 1984 Transient
84-21	84-26	48	43	Non-licensed operator training, QA program
	84-27		85	Startup Test Program
84-22	84-28	128	107	Routine Resident
84-23	· 84 - 29	4	4	Bioassay whole body counting program
	84-30		18	Startup Test Program
	84-31		85	Startup Test Program
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Inspection	<u>n Report No.</u>	Inspec	tion Hours	
Unit 1	· Unit 2	<u>Unit 1</u>	Unit 2	Areas Inspected
84-24	84-43			Operating Licensing Exam
84-25	84-32	72	10	Radiation Protection
84-26	84-33	115	181	Routine Resident
84-27		28		Emergency Preparedness
	84-34		320	Special Inspection - Loss of All AC Power Event of 7/26/84
84-29	84-35	35	35	Generic Letter 83-28, equipment classifica- tion, testing, vendor interfaces
	84-34 EC			Enforcement Conference
84-30	84-36	11	10	Civil/Structural Activities relating to Fifth Diesel Project
84-31	84-37	4	4	Waste Shipment
	84-38		48	Startup Test Program
84-32	84-39	14	14	Construction Activities Relating to Fifth Diesel Project
84-33	84-40			Operator Licensing - Requal
84-34	84-41	139	108	Routine Resident
	84-42		26	Startup Test Program
84-35	84-44	80	13	Special Resident Inspection; Scram Pilot Solenoid Valve Failures
84-35 EC		11		Enforcement Conference
	84-45		12	Startup Test Program

Inspection	<u>Report No.</u>	Inspec	tion Hours	
<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 1</u>	<u> Unit 2</u>	Areas Inspected
84-36	84-46	20	8	Construction Activities Relating to Fifth Diesel Project
84-37	84-48	33	33	Emergency Preparedness
84-38	84-47	175	107	Routine Resident
84-39	84-49	38	104	Radiological Control Program; Independent Measurements
84-40	84-50	70	69	QA Program and Design Change Program
85-01	85-01	127	66	Routine Resident
	85-02		21	Startup Test Program
85-02		29		Modifications
	85-03		24	Startup Test Program
85-03	85-04	17	16	External Dosimetry
85-04	85-05	18	18	Civil/Structural Activities Relating to Fifth Diesel Project
85-05		80		Snubbers
85-06	85-06	100	100	Appendix R
85-07	85-07	40	40 ,	Radiological Controls Program
85-08	85-08	14	14	Physical Security
85-09	85-09	214	73	Routine Resident "
85-10		57		ISI Activities
	· 85 - 10		28	Startup Test Program
85-11	85-11	110	110	IE Safety Inspection

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Inspection Unit 1	Report No. Unit 2	<u>Inspect</u> Unit 1	ion Hours Unit 2	Areas Inspected
85-12	85-12	165	80	Routine Resident
85-13		41		Steam Dryer Cracks
	85-13		29	Open Item Followup
	Total	3079	3493	

Note: Inspection Report 50-387/84-28 and 50-388/84-20 were cancelled.

TABLE 5

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LER SYNOPSIS (2/1/84 - 4/30/85)

SUSQUEHANNA STEAM ELECTRIC STATION

UNIT 1			
LER Number	<u>Event Date</u>	<u>Cause Code</u>	Description
84-007-00	2/02/84	X	Shear Valve Explosive Cartridge Unexpectedly Fired During Sur- veillance Testing
84-008-00	2/09/84	В	RHR Seal Water Coolers Inadequate Design
84-009-00	2/21/84	. D	Reactor Pressure Exceeded 150 psig with HPCI Inoperable
84-010-00	2/25/84	В	RPS Manual Scram Due to Stuck Open SRV
84-011-00	3/01/84	B,A	Unintentional Initiation of CREOASS and SBGT Due to Loss of Power to RPS Bus
84-012-00	2/25/84	D	Missed Surveillance on Off-Gas Hydrogen Analyzers
84-013-00	3/03/84	́В	Reactor Scram on Main Turbine Control Valve Fast Closure Due to Faulty Relay in Turbine Thrust Bearing Wear Detector Circuit
84-014-00	3/05/84	X,	Transformer (T2O) Trip and CREOASS and SBGT Initiation
84-015-00	1/21/84	В	High Background Radiation Surrounding Service Water Radiation Monitor Affected Set- point
84-016-00	3/08/84	Â	Missed Channel Check of New Fuel Vault Criticality Monitors
84-017-00	3/10/84	В	Emergency Service Water Spray Networks Frozen

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<u>LER Number</u>	<u>Event Date</u>	<u>Cause Code</u>	Description
84-018-00	3/03/84	В	Reactor Recirculation Pump Discharge Valve Stem Galling
84-019-00	4/15/84	A	Incorrect Jumper Installation Caused High Drywell Pressure Signal
84-020-00	3/21/84	X	RHR Shutdown Cooling Isolation Actuation Due to Spurious Signal
84-021-00	3/23/84	В	Raceway Fire Barriers Not Installed During Modification
84-022-00	3/31/84	В	Spurious Actuation of Turbine Building SPING Flush
84-023-00	4/04/84	X	High Sodium Pentaborate Concentration in SBLC Tank
84-024-00	4/22/84	A	Ventilation Zones II and III Inadvertently Cross-Connected
84-025-00	4/30/84	A	Two Main Turbine Surveillances Completed Late
84-026-00	5/16/84	В	Core Spray Valve Isolation Signal Design not in Accordance with Technical Specification
84-027-00	5/25/84	Α	Two Missed Chemistry Grab Samples Due to Personnel Oversight
84-028-00	6/13/84	С	Reactor Scram and Transformer T-10 Deenergization due to lightning strike
84-029-00	7/03/84	С	Reactor Scram and Transformer T-10 Deenergization due to lightning strike
84-030-00	· 6/27/84	X	Low Sodium Pentaborate Concentra- tion in SBLC tank
84-031-00	, 7/03/84 ,	x	HPCI Inoperable Due to Discharge Valve Not Seating

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<u>LER Number</u>	<u>Event Date</u>	<u>Cause Code</u>	Description
84-032-00	3/23/84	А	Fire Detector Surveillances Not Performed in Required Frequency
84-033-00	7/16/84	Α	Reactor Scram on Low Condenser Vacuum Due to Inadvertent Opening of LP Condenser Vacuum Breaker
84-034-00	7/15/84	C	Reactor Scram on Phase-to-Phase Fault Due to Tree
84-035-00	7/18/84	D	Reactor Scram Due to Turbine Trip on Loss of Vacuum
84-036-00	7/24/84	Α	Grease in RPS M-Set ±A' Motor Windings Caused Short Circuit and ESF Actuations
84-037-00	8/03/84	. X	EPA Breaker Trips Caused ESF Actuation
84-038-00	8/07/84	A	RHR Relay Not Included in Surveillance Procedure
84-039-00	9/06/84	A	Turbine Building SPING Out of Service
84-040-00	9/10/84	Х	Diesel Generator Turbocharger Bearing Failure and Additional Diesel Generator Failures
84-041-00	9/09/84 ,	· A	Missed Chemistry Samples Due to Faulty Communication
84-042-00	9/26/84	А	NQA Audit Identified Late Chemistry Samples
"84 -043-00	10/06/84	В	Auxiliary Boiler Arc-Over Caused Primary Containment Isolation
84-044-00	6/13/84	A,E	Rod Scram Time Measurements Exceeded Technical Specification Requirements
84-045-00	10/18/84	Α	Scram Discharge Volume Vent/Drain Valve Surveillance Completed Late

<u>UNIT 1</u>	, ,		
LER Number	Event Date	<u>Cause Code</u>	Description
84-046-00	8/22/84	В	 Fire Barrier Penetration Not Sealed
84-047-00	11/02/84	A	RWCU Isolation on High Flow During Demineralizer Transfer
84-048-00	12/24/84	A	Nitrogen Drywell Inerting Caused Overpressurization and Valve Seat Damage
84-049-00	12/14/84	A A	High Containment Oxygen Concen- tration and Missed Sample
85-001-00	2/13/85	D	SGTS Start on Refuel Floor High Radiation Signal During Steam Dryer Removal
85-002-00	1/21/85	В	Diesel Generator Failures Due to Cold Governor Oil
85-003-00	1/24/85	C	Reactor Scram Caused By Ice In Isophase Bus Ducts
85-004-00	1/29/85	X	B and D Diesels Inoperable Due to Maintenance and Spurious Vent Valve Operation
85-005-00	2/13/85	D	Simulated Thermal Power Time Con- stant Not Included in Surveil- lance Test
85-006-00	2/13/85	A	Monthly Composite Sample Analyses Not Completed Due to Low Sample Volume
85-007-00	2/16/85	А	RWCU Isolation Due to Inadvertent Breaker Operation
85-008-00	3/02/85	A,	SGTS and CREOASS Actuation Due to Inadvertent Grounding of RPS Transformer
85-009-00	3/10/85	X	Inadvertent Engineered Safety Feature Actuations Due to Noise Spikes Caused by Welding

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<u>LER Number</u>	Event Date	<u>Cause Code</u>	Description
85-010-00	3/13/85	D	SGTS and CREOASS Actuations Due to RPV Shine
85-011-00	3/23/85	x	SGTS and CREOASS Actuations Due to Radiography
85-012-00	4/04/85	A	Four Fire Dampers Not Included in Surveillance Procedures
85-013-00	4/16/85	X	Loss of Alternate Sampling While SPINGS Inoperable
85-014-00	4/13/85	A	SGTS and CREOASS Start Due to Inadvertent Breaker Operation
85-015-00	4/09/85	8	Fire Wrap Not Installed During Modification
85-016-00	4/25/85	А	Five Surveillances Completed Late

<u>UNIT 2</u>

LER Number	<u>Event Date</u>	<u>Cause Code</u>	Description
84-001-00	4/05/84	В	RPS Actuation on Spurious IRM Signal
84-002-00	4/10/84	A	Core Alterations Performed With SRM Channel ±A' Inoperable
84-003-00	4/09/84	X	Multiple RPS Actuation Due to In- termittent Fault
84-004-00	5/01/84	A	Unplanned ESF Actuations While Installing Test Equipment
84-005-00	5/15/84	A	Inadvertent ESF Actuation (RWCU Valve) During Surveillance Testing

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<u>UNIT 2</u>

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LER Number	<u>Event Date</u>	<u>Cause Code</u>	Description
84-006-00	5/28/84	X	Reactor Shutdown Due to Inoper- ability of the ±B' Loop of Low Pressure Core Injection
84-007-00	5/25/84	A	RWCU High Flow Trip Function Jumpered Out in Excess of the LCO Action Statement
84-008-00	5/27/84	В	Stuck Open Turbine Bypass Valve During Shutdown Due to Chipping Hammer Wedged in Seat
84-009-00	6/11/84	В	Vacuum Breaker Dual Position In . dication During Surveillance Test
84-010-00	6/27/84	А	HPCI Suction Startup Strainer Left in System After Testing
84-011-00	7/05/84	В	Four spurious ESF Actuations (SBGT and CREOASS) Caused by Faulty RPS Output Breaker
84-012-00	7/09/84	A	Incorrect Fuse Removal During Modification Disabled One Loop of Core Spray and Several Other Cir- cuits
84-013-00	7/26/84	А	Loss of AC Power to Unit 2
84-014-00	7/23/84	X	Reactor Water Cleanup Isolation Due to Loss of Reactor Building Chilled Water
84-015-00	8/02/84	X	RWCU Isolation Caused by Diffe- rential Pressure Instrument Drift
84-016-00	8/09/84	Α	Surveillance Test Completed Late
84-017-00	8/26/84	X	Two Reactor Scrams Due to Water in Turbine Crossaround Pipe
84-018-00	9/08/84	X	Reactor Scram Due to Power Load Unbalance Circuit Failure

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<u>UNIT 2</u>

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LER Number	<u>Event Date</u>	<u>Cause Code</u>	Description
84-019-00	9/09/84	В	HPCI and One RHR Pump Inoperable Simultaneously Due to Maintenance and a Faulty Circuit Breaker
84-020-00	9/29/84	А	RWCU Isolation During Instrument Calibration
84-021-00	9/30/84	B,A	Turbine Trip/Reactor Scram on Moisture Separator ±B' Drain Tank High Level
84-022-00	10/10/84	B	HPCI Inoperable and ADS Out of Service Simultaneously Due to High Turbine Vibration on HPCI and Surveillance Testing on ADS
84-023-00	12/06/84	A	Fire Watch Not Performed As Required
84-024-00	10/16/84	х	SBLC Low Boron Concentration During Surveillance Test
84-025-00	10/31/84	A	Unanticipated Actuation of SGTS and CREOASS Due to Incorrect Blocking
84-026-00	10/29/84	B	Fire Barrier Penetration Not Sealed
84-027-00	10/26/84	В	Fire Wrap Missing
85-001-00	1/12/85	В	HPCI Stop Valve Failed to Trip
85-002-00	1/12/85	А	ESF Actuations During Modifica- tion Work
85-003-00	1/19/85	B	Unit 2 Reactor Scram Due to High Turbine Vibration During Control Valve Testing
85-004-00	1/14/85	В	RWCU Isolations Due to Trips of the Reactor Building Chilled Water System
85-005-00	1/19/85	Α	Vacuum Breaker Surveillance Test Completed Late

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LER Number	<u>Event Date</u>	<u>Cause Code</u>	Description
85-006-00	1/29/85	Х	Unanticipated ESF Actuation - RHR Shutdown Cooling
85-007-00	1/30/85	А	SGTS Train Inoperable During Containment Purge
85-008-00	2/16/85	В	Loss of HPCI System and ±B' Loop of Core Spray Due to Broken Lug in 125 VDC Panel
85-009-00	2/12/85	Х	Reactor Water Level Switches Out of Calibration Due to Instrument Drift
85-010-00	2/23/85	X	ESF Actuation Due to Faulty Cir- cuit Breaker
85-011-00	3/10/85	В	Both Trains of SGTS Inoperable for Two Hours Due to Modification Work and a Failed Damper
85-012-00	3/16/85	А	SGTS and CREOASS Start Due to Error by I&C Technicians
85-013-00	3/27/85	X	SBLC Isolations Due to Mainten- ance on Leaking Relief Valve
85-014-00	4/17/85	X	RCIC Inboard Steam Supply Valve Isolation Due to Faulty Tempera- ture Switch
85-015-00 ;	4/21/85	Α	One loop of Emergency Service Water Inoperable Due to Open Sliding Link
85-016-00	4/27/85	D	RHR System Waterhammer

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TABLE 6

UNPLANNED AUTOMATIC SCRAMS (2/1/84 - 4/30/85)

SUSQUEHANNA STEAM ELECTRIC STATION

	Date	Power Level (%)	Cause
Unit 1	3/03/84	74	Turbine Trip during Turbine Thrust Bearing Wear Detector surveillance due to faulty relay.
	6/13/84	100	Lightning strike on 230KV transmission line caused level transient.
	7/03/84	100	Lightning strike on 230KV transmission line caused level transient.
	7/15/84	100	Phase-to-phase fault on 230 KV transmission line due to a tree caused turbine trip.
	7/16/84	27	Loss of condenser vacuum due to inadvertent opening of LP condenser vacuum breaker.
	7/18/84	27	Loss of condenser vacuum due to incorrect valve lineup which vented condenser to CST.
•	1/24/85	82	Load rejection on generator neutral phase overvoltage due to icing in the auxil- iary transformer isophase bus duct.
Unit 2	7/15/84	40	Phase-to-phase fault on 230 KV transmission line caused common recombiner isolation and loss of vacuum.
	8/26/84	40	Moisture separator drain tank high water level during surveillance testing on main turbine CIV No. 4.

	Date	<u>Power Level (%)</u>	. <u>Cause</u>
Unit 2	8/28/84	45	Moisture separator drain tank high water level during surveillance testing on main turbine CIV No. 4.
	9/08/84	50	Main turbine trip during weekly surveillance of tur- bine ouput mismatch logic caused by faulty pressure transmitter.
	9/30/84	100 .	Moisture separator drain tank high water level during RFP runout startup testing.
	1/19/85	100	Turbine trip on high vibra- tion during control valve testing.

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TABLE 7

FORCED OUTAGES (2/1/84 - 4/30/85)

SUSQUEHANNA STEAM ELECTRIC STATION

	Dates	Cause
Unit 1	2/25/84 - 2/29/84	Stuck open ADS valve during testing due to failed sole noid.
	10/13/84 - 10/17/84	Replacement of disc holder subassemblies in scram pilot solenoid valves.
	10/18/84 - 10/22/84	Overdue surveillance of scram discharge volume vent and drain valves.
	12/24/84 - 12/29/84 ,	Loss of primary containment integrity due to leaking isolation valves caused by Nitrogen Inerting.
Unit 2	5/28/84 - 6/11/84	LCO Action Statement Due to Excessive Leakage From LPCI Injection Valve.
	6/11/84 - 6/12/84	Suppression pool vacuum breaker limit switches gave dual indication.
	10/13/84 - 10/17/84	Replacement of disc holder subassemblies in scram pilot solenoid valves.
	3/21/85 - 3/24/85	Unisolable condensate system leak caused by vibration damage and generator stator cooling leak repairs.

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