U.S. NUCLEAR REGULATORY COMMISSION
REGION I

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Licensee:	PENNSYLVANIA POWER AND LIGHT COMPANY (PP&L) 2 NORTH NINTH STREET ALLENTOWN, PENNSYLVANIA 18101
Facility Name:	SUSQUEHANNA STEAM ELECTRIC STATION
Inspection Period:	July 30, 1996, through September 9, 1996
Inspectors:	K. Jenison, Senior Resident Inspector B. McDermott, Resident Inspector J. Carrasco, Engineering Inspector R. Ragland, Radiation Specialist
Approved by:	W. Pasciak, Chief Projects Branch 4

EXECUTIVE SUMMARY

Susquehanna Steam Electric Station, Units 1 & 2
NRC Inspection Report 50-387/96-09, 50-388/96-09

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a six week period of resident inspection; in addition, it includes the results of a meeting between Pennsylvania Power & Light Company (PP&L) and NRC management, and inputs from announced inspections by two regional inspectors.

Operations

- On August 2, 1996, a bus lockout occurred during the replacement of an over-current relay in the alternate feeder breaker to a safety related 4 kV engineered safeguard system bus. Power was lost to Division 1 of the reactor protection system which in turn actuated a Division 1 primary containment isolation. The operators responded to the transient adequately. The corrective actions implemented by the Operations Department to prevent the recurrence this type of event were aggressive and introspective.

- On September 4, 1996, an electrical fault on the Unit 1 "B" circulating water pump caused it to trip resulting in a reactor recirculation pump runback. The unit responded normally to the runback with a few minor exceptions on non-safety related equipment. The operators responded to the transient adequately. Licensee management involvement and overall event followup actions were determined to be aggressive.

- On August 1, Unit 1 scrammed from 98% power when the main turbine tripped on high vibration. The licensee correctly reported the automatic reactor scram to the NRC as an unplanned engineered safety feature actuation. The licensee's review of the scram was good, however, Operations Department identification of precursor events was not adequate. Actions to enhance the Condition Report Significance Reviews are considered good initiatives, including better identification and prioritization for risk significant (transient initiating) component problems.

- A single Core Spray test line containment isolation valve, F015B, was opened and deactivated for 24 hours on July 30. The operators did not take the action required by Technical Specification (TS) 3.0.3 when they were unable to comply with the Limiting Conditions For Operation of TS 3.6.3. This apparent violation of NRC requirements is being considered for escalated enforcement.

Executive Summary

- A weakness was identified in the use of status control tags (SCT). The SCT indicated that access through a tagged door was acceptable but this provided a conflicting message to plant workers. There was indication that some plant workers may not have understood the requirement to call the control room before manipulation of equipment labeled with a SCT. This observation is similar to findings reported in NRC Inspection Report 50-387/96-08 related to manipulation of a heat trace breaker without first contacting the control room.

Maintenance

- The licensee's use of the valve backseat during maintenance on July 30 instead of relying on the valve packing to maintain the closed system boundary required by TS 3.6.3 appeared to be inconsistent with the Final Safety Analysis Report and licensing documents. This issue has been referred to NRR for evaluation.

Engineering

- An Independent Spent Fuel Storage Installation (ISFSI) is being constructed West of the cooling towers and North of the low level radwaste building. The ISFSI site will consist of a basemat for single and double rows of pre-cast horizontal storage modules (HSMs).

- In general, the analysis, design and construction of the ISFSI basemat pad was conducted under good engineering and quality assurance (QA) controls. However, the NRC communicated to the licensee that some of the current ISFSI design assumptions made by the licensee would need further NRC review. The licensee delayed the initial concrete pour on the ISFSI laydown areas and rescheduled the concrete pour for the truck access portions.

Plant Support

- The licensee continued to maintain an overall effective program for radioactive material, radioactive waste management and transportation. Radioactive waste processing, shipping records, quality control involvement in the shipping program, efforts to reduce dry active waste generation, quality assurance oversight, and implementation of the newly revised transportation regulations (49 CFR 100-179, 10 CFR 20, and 10 CFR 71) were all noted as good. The inspector noted the licensee's discovery of several high radiation area posting deficiencies and the ongoing evaluation of radiological posting practices. An unresolved item was opened pending NRC review of the licensee's corrective actions to prevent recurrence (Section R8.1). An unresolved item was also opened to review the storage of clean materials in the low level radwaste holding facility (LLRWHF) in conflict with Updated Final Safety Analysis Report (UFSAR) Section 11.6.11, (Section R8.3).

- Security personnel and management demonstrated a good understanding of the security plan. The licensee was observed implementing it's security plan during the performance of bulk shipment searches, and the lighting of temporary structures. Aspects of these issues that were considered weaknesses by the inspector were communicated to the licensee.

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Report Details

Summary of Plant Status

Unit 1 began this inspection period at 100% power. Throughout the inspection period, the Unit implemented an end-of-life power coast down. On August 1, Unit 1 scrammed from 98% power when the main turbine tripped on high vibration (Section O1.3). Following a post scram review the unit was restarted, synchronized to the grid on August 5, and reached 99% power on August 8. Power was reduced to 75% from August 9 through August 18 to support investigation of a possible bearing problem on the "C" reactor feed pump.

On September 4, 1996, with Unit 1 at approximately 90% power, an electrical fault of the "1B" circulating water pump caused it to trip, activating a reactor recirculation pump runback. The unit remained at approximately 59% power until September 7, 1996, when it was manually scrammed in order to commence the ninth refueling and inspection outage.

Unit 2 was restarted on August 3, following the unplanned shutdown that occurred on July 14. As of August 8, the Unit was at 100% power. The Unit was maintained at this power throughout the remainder of the inspection period, with the exception of a few short periods.

I. Operations

O1 Conduct of Operations[1]

O1.1 Loss of a Unit 1, 4 kV Bus

a. Inspection Scope (93702)

On August 2, 1996, a bus lockout occurred during the replacement of an over-current relay in the alternate feeder breaker to a safety related 4 kV engineered safeguard system (ESS) bus. Unit 1 was at approximately 30% power when the lockout occurred while returning 125 Vdc control power to a relay. As a result, power was lost to Division 1 of the reactor protection system (RPS) which in turn actuated a Division 1 primary containment isolation. The "A" emergency diesel generator started, but did not load due to the bus lockout. The inspector reviewed the licensee's response to the event, investigation of the event, implemented corrective actions, and the proposed corrective actions.

b. Observations and Findings

The licensee entered a number of TS action statements including TS 3.0.3 during this event. The response actions taken by the operators were determined to be

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[1]Topical headings such as O1, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics.

adequate. The licensee determined that the bus lockout occurred as a result of a maintenance worker performance deficiency where an electrical lead was incorrectly landed. This event was the second event in a thirty day period that resulted from the activities of the PP&L Relay and Test group.

The licensee's actions in response to the bus lockout included conducting operations peer reviews and shift training, and assigning a special event investigation team and a special maintenance response team to investigate the event. Also, the Plant Operations Review Committee reviewed the event and the associated corrective actions. PP&L upper management was actively involved in the post event corrective action process, up to and including the Vice President of Nuclear Operations. Parallel reviews and evaluation were also conducted by ISES and QA who individually reported to offsite senior PP&L management.

c. Conclusions

The licensee devoted substantial resources to review the event, a high level of management involvement was evident, and the independent reviews were thorough and provided strong support to the Operations Department. The inspector concluded that the licensee's corrective actions, which included reorganizing its approach to conducting and controlling Relay and Test Group maintenance, were aggressive and introspective.

O1.2 Electrical Fault on the Unit 1 "B" Circulating Water Pump

a. Inspection Scope (93702)

On September 4, 1996, an electrical fault on the Unit 1 "B" circulating water pump caused it to trip, resulting in a reactor recirculation pump runback. The inspector reviewed the licensee's event response and investigation.

b. Observations and Findings

The unit responded normally to the runback with the exception of the chilled water system and the reactor water cleanup (RWCU) system. Reactor building chiller "1A" was running prior to the event and tripped. However, the "1B" chiller did not auto start. The "B" RWCU pump tripped, ultimately resulting in a non-regenerative heat exchanger isolation. The actions of the operators were determined to be adequate.

The licensee developed a menu of initial corrective actions, which were in progress at the close of this inspection period. These corrective actions were similar to those in response to the August 2, 1996, event discussed in paragraph O1.1 of this report. However, this event was determined to have been initiated by an equipment failure, and a significant diagnostic effort was not necessary for this event.

c. Conclusion

The Unit responded normally to the fault related reactor recirculation pump runback with some minor exceptions that are being investigated by the licensee. SSES management involvement and overall licensee followup activities for this event were determined to be aggressive.

O1.3 Unit 1 Scram On Main Turbine Vibration

a. Inspection Scope (71707)

On August 1, Unit 1 scrammed from 98% power, when the main turbine tripped on high vibration. The inspector reviewed the licensee's post scram review and root cause investigation findings.

b. Observations and Findings

At 5:33 a.m. on August 1, Unit 1 was operating at 98% power, when a reactor scram occurred as a result of a main turbine control valve fast closure. The turbine trip (control valve fast closure) was caused by a spurious high vibration indication on the Number 1 turbine bearing. The vibration trip protection system logic is a one-out-of-one arrangement.

In response to the scram signal, all control rods fully inserted. Both reactor recirculation pumps tripped on End Of Cycle Recirculation Pump Trip (EOC-RPT) logic due to the turbine control valve fast closure. The reactor vessel water level reached a low of +6 inches and all Level 3 isolations (+13 inches) were verified by the licensee. Five safety relief valves lifted and reseated. Reactor pressure reached a maximum of 1127 psig. The feedwater control system restored the reactor water level to its normal band and operators restarted the reactor recirculation pumps. The plant was maintained in hot shutdown condition until the mode switch was taken to Startup on August 3.

The licensee correctly reported the automatic reactor scram as an unplanned Engineered Safety Feature actuation under 10 CFR 50.72 and 50.73.

The licensee's Event Review Team (ERT) investigation found that spurious turbine high vibration alarms occurred on June 17 and July 14. The July 14 occurrence was captured in a Condition Report (CR), however the investigation was not given a high priority and was in progress at the time of the scram.

The licensee concluded that the response to these precursor alarms was less than adequate and that there was a low sensitivity to the potential malfunction of risk significant equipment. It was also concluded that the alarm response procedure was inadequate.

The inspector reviewed the licensee's corrective actions in the area of CR Significance Reviews. The short term actions added a requirement for reviewing the degraded components against the 1991 SSES Reliability Study which identified balance of plant single failures that lead to scrams or forced shutdowns. Longer term actions included procedural improvements regarding the general content and guidance for performing Significance Reviews.

c. Conclusion

The licensee's review of the August 1, 1996, Unit 1 scram resulting from a main turbine high vibration trip was good. Investigation of precursor events was not adequate. Actions to enhance the Condition Report Significance Reviews is considered a good initiative, including better identification and prioritization for risk significant (transient initiating) component problems.

O1.4 Inconsistent Use Of Status Control Tags

a. Inspection Scope (71707)

On August 22, 1996, during a tour of the Unit 1 reactor building 683' elevation, the inspector observed Status Control Tags (SCTs) on the fire doors leading to the stairwells. The inspector reviewed this application against the licensee's Status Control Program.

b. Observations and Findings

During a tour of the Unit 1 reactor building 683' elevation, the inspector observed SCTs on the fire doors leading to the stairwells. The tags were issued in conjunction with a residual heat removal (RHR) on-line maintenance activity. The phrase "Passage Allowed" was written on the SCTs. The inspector questioned the Unit 1 PCO and Unit Supervisor (US) regarding the number of calls they received requesting permission to use the doors. They stated that approximately three calls were received.

Step 6.3.14 of Nuclear Department Administrative Procedure NDAP-QA-302, "System Status and Equipment Control," Revision 6, states that repositioning/operating components controlled by Status Control Tags may be performed with the permission of the individual or work group who required the tag and either Operations Shift Supervision or Operations Outage Group Supervision.

The inspector determined that with the RHR maintenance activities in progress that day, a greater number of calls would be expected if all personnel were following the requirements of NDAP-QA-302. Interviews with operators indicated that only a few plant workers actually contacted the control room as required by the System Status and Equipment Control procedure. The message provided on the SCT was apparently interpreted by some plant workers as permission to not contact the control room.

The inspector concluded this observation is consistent with previously identified weaknesses with implementation of the Status Control Program. These weaknesses will be addressed collectively as part of an existing NRC open item (EEI 96-08-05).

c. Conclusion

Status Control Tags indicating "Passage Permitted" were used on three doors in the Unit 1 reactor building routinely accessed by plant personnel. This observation indicates a weakness in the application and understanding of the status control process, and will be reviewed as part of an existing NRC open item.

O1.5 Operations Related Surveillance/Test Activities

a. Inspection Scope

The inspector observed portions of the following Operations related activities.

- SO 258-004 Reactor Protection System EPA Breaker Surveillance, on July 29, 1996.
- SO 252-002 Quarterly HPCI Flow Verification, on September 5, 1996.
- OP 193-002 Main Turbine Emergency Bearing Oil Pump Functional Test
- SO 100-006 Shiftly Surveillance Log

b. Conclusions

The activities were adequately performed per procedure. Operators performed the functions in a sound manner and were well supervised.

O3 Operations Procedures and Documentation

O3.1 Response to Hydraulic Control Unit (HCU) Common Alarm AR 103-H6

Alarm Response Procedure AR 103-H6 was performed in response to a common alarm for low pressure and/or high water level. On August 20, 1996, Unit 1 received such an alarm. The PCO responded appropriately by sending a Nuclear Plant Operator (NPO) to the scene to determine the specific cause of the alarm. The cause of the alarm was determined to be low nitrogen gas pressure in the accumulator (less than 950 psig). The accumulator was blown down to eliminate condensate accumulation and repressurized.

The operator did not enter TS 3.1.3.5 limiting condition for operation (LCO) because the as-found HCU pressure was 950 psig compared to the 940 psi TS surveillance acceptance criteria.

The inspector reviewed the PCO's actions with the Unit Supervisor following the restoration of the HCU. The following issues were identified:

- The operator did not refer to the AR during or following the HCU pressure restoration activities.

- The operator did not perform step 2.3 of the AR which required the operator to check control rod drive pump operation and valve lineup in accordance with operating procedure OP-155. The operator explained that there was an existing Operations checklist which adequately described the configuration of the control rod drive system and that he felt the existence of the checklist met the intent of step 2.3 of the AR. The failure to implement step 2.3 in the AR constitutes a violation of minor significance and is being treated as a Non-Cited Violation consistent with Section IV of the NRC Enforcement Policy.

- The operator documented the HCU alarm in the special OP-105 log (as required by the AR) and initiated a Work Authorization (WA). The inspector noted that this particular HCU had seven low pressure conditions between July 7 and August 27, 1996. During a discussion with the operator it was determined that the previous evening the leakage cap had been replaced by an NPO. The inspector determined that a WA was not used to replace the cap on the HCU. WA use was not required because the cap was not considered safety related and the activity was considered less than minor maintenance.

The failure to implement step 2.3 of the HCU AR procedure constituted a violation of minor significance and is being treated as a Non-Cited Violation consistent with Section IV of the NRC Enforcement Policy.

O4 Operator Knowledge And Performance

O4.1 Response To Instrumentation Fitting Failure

On September 6, 1996, an instrument tube fitting on the Reactor Water Cleanup Purge Pump skid failed. A small leak of condensate (1 - 2 gpm) was reported to be spraying from the purge pump skid by a Nuclear Plant Operator (NPO). The inspector was present in the control room and observed the operators' response to this incident.

The Unit Supervisor recognized the need to secure the purge pump and anticipated the consequential alarms. Initial communications between the licensed Plant Control Operator and the NPO on the scene were not clear. Subsequently, the Unit Supervisor (US) requested the Assistant Unit Supervisor to support the recovery actions in the plant. The Operations Manager was present at the time of the incident, observed the communication problem, and discussed the need for additional oversight of the NPO with the US.

The overall response of control room operators to a non-safety related instrument fitting leak on September 6, 1996, was good. No consequential problems were noted with the initial communication to the non-licensed operator in the plant.

O8 Miscellaneous Operations Issues (92700)

O8.1 (Closed) Deviation 95-08-01: Uninterruptible power supply (UPS) 2D240

Following a Unit 2 reactor scram on April 15, 1995, some control room indications and other components were lost when a portion of instrument power was lost in the control room. The operators followed the appropriate off normal operating procedure, and referred to alternate instrumentation. Instrument power was lost because the UPS was misaligned when a 4.16 kV ESS bus transient occurred. Although the UPS supply is non-safety related, the equipment failure was pursued by the NRC because the loss of indication and components in the control room provided an unnecessary complication to the operators while trying to recover the plant, post scram. The licensee implemented adequate corrective actions, which included procedure and training upgrades. This item is closed.

O8.2 (Closed) LER 50-387/96-005-00: Isolation of both Containment Radiation Monitors during a routine Reactor Protection System surveillance required entry into TS 3.0.3. This issue is discussed in NRC Inspection Report 50-387/96-08. The licensee's Improved Technical Specification submittal addressed this issue for the long term and a TS amendment is planned for the short term (i.e., until ITS is approved). Pending approval of a TS amendment, the licensee will submit an LER for each occurrence. This item is closed.

O8.3 (Closed) URI 50-387;388/95-12-02): Eight supplemental LERs were not submitted by the date indicated in an initial LER. The expected submittal dates were exceeded by at least six months, and in most cases by more than a year. In response to this issue, the licensee has formalized their process for tracking commitments to submit supplemental LERs. The inspector did not identify any technical issues or safety problems related to the late supplemental LERs. This item is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703)

The inspectors observed all or portions of the following work activities:

Maintenance

- WA S66901 Replacement Of "E" DG Low Lube Oil Pressure Switch PSL-03468E2
- WA S60074 RHR Swing Bus M-G Set, Generator Bearing Replacement
- WA 567544 Railroad Bay Radiation Monitor
- WA 50136 HPCI Vibration Monitoring
- WA P61506 Reactor Vessel Wide Range Pressure

Surveillances

- SI 283-207 Unit 2 Quarterly Main Steam Flow Functional Tests of FIS-B21-2N008A and B, and 9A and B
- SI 079-234 Radiation Monitor 18 Month Calibration
- SE 154-204 18 Month ESW Pump "D" Alternate DC Trip Test.

b. Observations and Findings

In general, the inspector found that the observed portions of the maintenance and surveillance work were performed in accordance with applicable procedures, and workers were cognizant of prerequisites and aware of station policies.

M1.2 Inadequate Containment Isolation During On-line Maintenance

a. Inspection Scope (62707)

On July 30, 1996, the licensee opened and backseated the Core Spray (CS) full flow test valve (F015B) to the suppression pool. The motor operator for this containment isolation valve was then deactivated to support removal and replacement of its packing for preventative maintenance. The inspector evaluated this valve configuration to determine if it met the SSES Technical Specification (TS) requirements for containment isolation.

b. Observations and Findings

Background

CS F015B is a single containment isolation valve on the CS full flow test line to the suppression pool. The isolation requirements for this penetration are described in FSAR Section 6.2.4.3.6, "General Design Criteria 56 Isolation Provision with a Single Isolation Valve Outside Containment." The closed system outside containment is credited as the second isolation barrier.

TS 3.6.3, "Primary Containment Isolation Valves," Action a, requires that with one or more containment isolation valves inoperable, the licensee must maintain at least one operable isolation valve in the affected penetration and within 4 hours take additional actions to isolate the penetration or repair the inoperable valve.

Footnote (c) of TS Table 3.6.3-1, states that the redundant isolation boundary for F015B is provided by the closed system whose integrity is verified by a Type A test (10 CFR 50, Appendix J). The licensee's Technical Specification Interpretation (TSI) 1-95-002 and Technical Specification Action Request (TSAR) 94-020 both assume that the "one operable isolation valve" required by TS 3.6.3 can be met by maintaining the closed system boundary credited in the FSAR.

At 5:45 a.m. on July 30, the licensee opened the CS F015B valve against its backseat, and deactivated its motor operator, in preparation for preventive maintenance. The valve packing was removed and replaced based on licensee identified problems with the same style packing on other valves. Based on the TSI and TSAR, the unit supervisor documented entry into TS 3.6.3 and considered the Action to "isolate the penetration within 4 hours" to be met by maintaining the CS piping boundary intact and water filled. The packing for F015B was replaced by approximately 4:00 p.m. on July 30. Following a diagnostic test for F015B and a CS operability surveillance, the TS 3.6.3 entry was cleared at 6:50 a.m. on July 31.

Reliance On Valve Backseat As System Boundary

The licensee's assessment of applicable TS for the maintenance activities did not consider the valve packing as part of the system boundary. Nuclear System Engineering personnel stated that they considered the valve backseat to be a suitable boundary, similar to a manual valve which TS 3.6.3 would allow for isolation of an open penetration.

The inspector questioned the licensee's position since the valve is not placed on its backseat during the Appendix J, Type A test. The inspector was not able to identify any reference to this configuration as an acceptable system boundary in the SSES FSAR or other licensee commitments. This issue has been discussed with the NRR Project Manager and has been sent to NRR for resolution.

Compliance With TS Action Statement For Containment Isolation

SSES TS 3.6.3 requires the licensee to maintain at least one operable isolation valve in the affected penetration. At 5:00 a.m. on July 30, the single containment isolation valve in the CS test line (F015B) was declared inoperable. Since the single isolation valve for the penetration was inoperable, the LCO in TS 3.6.3 could not be met and the action statement for TS 3.0.3 was therefore applicable. The actions required by TS 3.0.3 were not taken by the licensee. The licensee's failure to take the action required by TS 3.0.3 is considered an apparent violation of NRC requirements and is being considered for escalated enforcement in accordance the NRC Enforcement Policy. **(EEI 96-09-01)**

This issue is considered significant by the inspector because the licensee's approach to meeting the action statement of TS 3.6.3 would allow the only containment isolation valve in a single isolation valve penetration to be open and inoperable with no time constraint.

c. Conclusion

The single Core Spray test line containment isolation valve, F015B, was opened and deactivated for 24 hours in support of preventive maintenance. The licensee did not take the action required by TS 3.0.3 when they were unable to comply with the LCO of TS 3.6.3. This apparent violation of NRC requirements is being considered for escalated enforcement.

It is not clear that the licensee's use of the valve backseat, instead of the valve packing, to maintain the closed system boundary required by TS 3.6.3 is consistent with the FSAR or licensing documents. This issue has been referred to NRR for evaluation.

M1.3 Electrical Maintenance Work Practice

On August 22, 1996, the inspector observed restoration of the Unit 1 residual heat removal system swing bus motor-generator set following replacement of the generator bearings. The inspector observed that leads that were lifted to support the bearing replacement had been re-landed and that Form MT-GE-010-1, "Cable And Wire Termination Data Sheet" was not completed. Initials for landing the leads and verification of their location were blank: Electrical maintenance personnel in the area stated that the individual who had performed certain steps and verified others had left the area.

MT-GE-010-1 requires the electricians to use the data sheet but does not provide any instructions or expectations on how it is to be used. No violation of plant procedures was identified, however, the inspector discussed the observation with SSES management because PP&L had concluded that similar inadequate electrical maintenance work practices were central to the cause of the July 14, 1996, Unit 2 reactor scram.

Corrective actions from the Unit 2 scram did not specifically address work practices for wire terminations, although the corrective actions did include a re-emphasis on standards and expectations. However, the inspector did not identify any written standards on documentation of landed leads or independent verification.

The safety impact of this particular observation was negligible, however it surfaced questions of consistency between electrical maintenance work practices and management expectations for work performance. The licensee has assigned an Event Review Team to review the swing-bus motor generator work and past incidents related to wiring errors.

M1.4 Maintenance Planning

In response to past bargaining unit issues, the licensee developed an entry level test to identify workers who can become Planners. The Planners are then given training specific to their responsibilities. Several incumbent Planners did not pass the new entry level test. SSES management stated that the current Planners were trained and task certified, and therefore were still qualified for their positions. Within a year, the licensee plans to have the planning group completely staffed with individuals who have passed the entry level test.

M3 Maintenance Procedures and Documentation

M3.1 Supplemental Decay Heat Removal System Installation

The inspector observed/reviewed a portion of the site supplemental decay heat removal system modification and questioned the licensee concerning a supported load above a trench, in which the modification piping was positioned. The load was rigged based on general construction experience and determined to be safe by the job foremen, Site Safety, and SSES management.

During the inspector's review of the rigging arrangement, it was not evident that it was consistent with the site rigging manual. Subsequent to discussions with the licensee and the completion of the pipe installation by the licensee, the trench was filled and the load suspended onto the ground.

III. Engineering

E1 Conduct Of Engineering

E1.1 Independent Spent Fuel Storage Installation (ISFSI) Pad Review

a. Inspection Scope (60851)

The scope of this inspection was to ensure that the ISFSI pad and the load path of the transfer cask were analyzed, designed, and was being constructed in accordance with NRC regulatory requirements, FSAR, geotechnical report recommendations and industry standards.

b. Observations

The inspector reviewed the pad foundation seismic analysis, soil testing report and roadway qualification for the load path.

ISFSI Pad Foundation Seismic Analysis

At Susquehanna, an ISFSI is being constructed west of the cooling towers and north of the low level radwaste building.

The ISFSI site consists of basemat for single and double rows of pre-cast horizontal storage modules (HSM). The north end basemat stores a single row of 21 pre-cast HSMs, followed by an approach slab, which, in turn, is followed by a basemat that stores 42 double rows of pre-cast HSMs.

The NRC inspector performed a limited review of the Vectra Fuel Services (VFS) Calculation No. 16-77.0200. In this calculation, the inspector verified that the design of the fully-loaded basemat slab (pad) was performed in accordance with the requirements established by the American Concrete Institute ACI 318-89 Code based on the maximum calculated bending moment and shear forces.

The maximum calculated soil-bearing pressure for fully-loaded Basemats 1 and 2 of 2.11 ksf and 2.40 ksf, respectively, was less than the allowable soil-bearing pressure of 4.0 ksf established in the foundation investigation report for the ISFSI.

The licensee's methodology used for the seismic soil structure interaction (SSSI) analysis adheres to current accepted practice for structural dynamics and NRC recommendations. Although the pad at Susquehanna is a Category 2 structure, the licensee performed a seismic soil structure interaction analysis (PP&L Calc. No. 16-77.0200) in accordance with the NRC standard review plan (SRP) guidelines of Section 3.7.1.

The pad SSSI was performed in accordance with the design basis established in the Susquehanna FSAR and NRC Regulatory Guides.

The design response spectra for the SSSI analysis was prepared using NRC Regulatory Guide 1.60 and a horizontal safe shutdown earthquake (SSE) spectra acceleration of 0.10g (Section 3.7 of the FSAR). This acceleration was used as input for the rock motion in the horizontal and vertical directions.

The two horizontal and single vertical artificial time histories are statistically independent and were generated to match the 5% damping prescribed in NRC Regulatory Guide 1.60 motion. This 5% damping also satisfied the requirements of the SRP, Section 3.7.1.

For the analysis, a Poisson's ratio of 0.371 and a unit weight of 130 lb/ft^3 were used for the ISFSI. This Poisson's ratio is an average of the Poisson's ratio of the soil profile provided in the FSAR Table 2.5-6.

In the structural analysis, the inspector verified that the licensee performed the analysis in the appropriate frequency domain and that the transfer function was generated up to a maximum cutoff frequency of 33 Hz.

Review of the Load Path

The inspector verified that the licensee analyzed and evaluated the transport path for the loaded trailer moving from the spent fuel building to the ISFSI.

In calculation No. EC-012-6032, Rev. 0, the licensee performed a thorough review of the plant's original site construction and architectural drawings to locate and identify the underground utilities (i.e., ductbanks, piping, conduits, and culverts) along the load path.

Calculation No. EC-012-6032, Rev. 0, demonstrated that the underground utilities along the load path will not be affected by the transport of the loaded trailer. To verify this conclusion, the worst loading case was analyzed, which showed that the underground electrical ductwork along the load path was designed to sustain a specified Cooper E-80 railroad load of 54,000 pounds. The calculated weight of the transfer cask, the loaded dry shielded canister and the trailer per axle (the trailer to be used has eight axles) was approximately 31,000 pounds. This weight is less than the established limit of 54,000 pounds.

The following observations were made during a load path walkdown:

- Small cracks in the asphalt were noted through the load path. These cracks were examined by the licensee's structural engineer who determined that they were superficial, and will not affect the structural integrity of the road surface/base/sub-base. This evaluation was performed per (TA/DSC/TRL), in Calculation EC-012-6032.

- The slope along a segment of the load path appeared to be very steep. Contingency plans for any postulated mechanical breakdown of the trailer going up this slope were discussed with the licensee. The trailer is designed as a single-failure breaking system with full air-operated internal expanding brakes.

c. Conclusions On ISFSI Pad Foundation Seismic Analysis

The SSSI analysis was performed in accordance with established NRC Regulatory Guides using the approved design parameters in the FSAR. The geometry and the material properties of the pad were properly input in the computer model. The calculations were performed using a state-of-the-art computer program and an NRC-accepted methodology. An in-depth review will be performed by NRR to determine the technical accuracy of the SSSI and the soil report.

Conclusions On Load Path

Based on a review of Calculation No. EC-012-6032, Rev. 0, drawing review and interviews with the civil engineer, the licensee's evaluation of the load path was thorough. Based on this evaluation, the licensee determined that there was no need for modifying the road.

E1.2 Independent Spent Fuel Storage Installation Design Review

a. Inspection Scope (60853)

The inspector observed the construction of a portion of the SSES ISFSI. The observation included a verification of the reinforcing material and its placement. In addition, a portion of the placement and testing of the concrete was observed.

b. Observations and Findings

On August 21, 1996, NRC Region I, NRR, and PP&L conducted the first of two conference calls to discuss the design and construction features of the ISFSI. The inspector attended this meeting and verified the construction assumptions made by the NRC in the field.

Several areas of concern were identified as a result of the site inspections and NRR review of the original and modified designs. These concerns included:

- Considerations of soil liquefaction under the ISFSI
- Modification of the design from tied rebar to welded wire mesh
- Several calculational assumptions and techniques made by PP&L
- Construction techniques used on the welded wire mesh

c. Conclusions

The NRC communicated to the licensee that some of the current design assumptions made by the licensee would need further NRC review. The licensee delayed the concrete pour on the ISFSI laydown areas and rescheduled the concrete pour for the truck access portions.

E2 Engineering Support of Facilities and Equipment

E2.1 Identification Of Deficiencies On Safety Related Equipment

a. Inspection Scope (37551)

The inspector reviewed the licensee's identification of problems with safety related ventilation equipment.

b. Observations and Findings

Diesel Generator (DG) Building Fan

On August 11, 1996, the licensee identified that all three indication lights (amber, white, and red) for the "A" DG building fan were illuminated in the control room and at a local panel. Status control tags were placed on the hand switches to keep the fan running. On August 20, the inspector requested a copy of the operability determination and was told that a CR had not been written. Later that same day,

CR 96-1211 was written to document the fan problem and an operability determination. The inspector found the operability determination reasonable and supported operability of the DG, pending corrective maintenance for the fan controls. However, the degraded condition existed for nine days before it was entered into the CR process.

RHR Service Water Ventilation Exhaust Damper

WA V66413, initiated on June 27, 1996, identified that RHR Service Water fan damper TD28201B4 did not open when the fan was started and that it opened after an operator tapped the controller. On August 6, during a quarterly maintenance rule review of work authorizations, the System Engineer initiated a CR 96-1113 to document the degraded condition that was identified on June 27. Immediate actions were taken to confirm that the damper would physically stroke full open and closed without binding. The fan was started and all dampers were observed to operate normally. However, the inspector found that these actions did not address the potential controller problem and that no operability determination was documented. The inspector discussed the damper problem and the lack of a documented operability statement with the system engineer. The inspector concluded that the engineer's justification for operability was reasonable and the engineer stated the justification would be documented as part of the CR resolution.

The identification of the problem by the engineer during a maintenance rule review was viewed as a strength. The inspector considered the licensee's failure to identify and document the problem until August 6 to be a weakness in implementation of the corrective action process. The documentation of an operability determination for CR 96-1113 also was not timely.

c. Conclusion

In two instances, a Work Authorization was used to identify a problem with a safety related ventilation system component and no Condition Report was initiated. The identification and evaluation of these conditions adverse to quality was not timely, however there was no safety impact due to the delay.

E8 Miscellaneous Engineering Issues

E8.1 Review of License Conditions

The inspector reviewed current Unit 1 and 2 SSES license conditions in response to a Region I initiative. The inspector did not identify any plant conditions that were in conflict with the license conditions or safe operation. Additional historic information has been requested to verify compliance with Unit 1 license conditions C13, C20, C23d, C23e, and C30b, and Unit 2 license conditions C4, C5, C8a, C10 and C12e.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

The radioactive waste management and transportation program was reviewed. Specific areas reviewed included: the solid radioactive waste program; the radioactive waste/material shipping program; implementation of revised regulations; facilities and equipment; procedures; staff training; organization and administration; and program audits and appraisals. In addition, licensee response to violations in the area of radiological controls were reviewed and an evaluation of facility condition versus the UFSAR was performed.

R1.1 Solid Radioactive Waste Program

a. Inspection Scope (86750)

The inspector performed a review to evaluate if the licensee maintained current copies of applicable regulations, provided management approved procedures, and had an adequate basis for certifying that radioactive wastes intended for disposal were properly classified, described, packaged, marked and labeled for transportation. In addition, the inspector reviewed program initiatives to reduce dry active waste (DAW) generation. The inspector gathered information by a review of records and procedures, and interviews with cognizant personnel.

b. Observations and Findings

The licensee used a combination of direct isotopic sampling, scaling factors, and dose-to-curie conversions to determine the isotopic and curie content of radioactive waste containers. Waste streams were sampled and sent to an offsite laboratory on a periodic basis to determine the radioactive content. Hard to measure radionuclides (beta and alpha emitters) were related to the gamma emitting isotopes through scaling factors. The radwaste group primarily uses the computer code RADMAN to classify and prepare radioactive waste shipments. The inspector selectively verified that the version of RADMAN being used had been updated to incorporate the revised 49 CFR Parts 100-179, 10 CFR Part 20, and 10 CFR Part 71 transportation regulations. The inspector examined several radwaste shipping records to evaluate the accuracy of waste classification. No discrepancies with radioactive waste classification were identified.

The inspector examined and verified that the licensee had up-to-date computerized copies of 49 CFR Parts 100-179, 10 CFR Part 20, and 10 CFR Part 71; applicable regulations for the state of South Carolina; and licenses for facilities to which shipments of radwaste or radioactive materials were made. In addition, the inspector verified that the licensee had management approved, detailed procedures for the transfer, packaging, and transport of radioactive waste. The inspector also noted that appropriate procedures were updated to include the newly revised regulations.

The inspector also reviewed goals and action plans established to reduce the generation of dry active waste (DAW), and a summary of annual DAW generation. Plans for reducing DAW generation includes focusing station attention on waste minimization practices, changing work habits, and substituting consumable items with reusable materials. DAW volume reduction goals were set through the year 2000. The 1996 goal is 25% less than the 1995 goal and the 1997 goal is 20% less than the 1996 goal.

The inspector reviewed a document entitled "Effluents 18 Month Goal/Action Plan for DAW," and noted that specific DAW actions and goals were established, scheduled, and tracked. Examples included establishing guidelines for the use of floor coverings, implementing DAW reduction training, and implementing a waste cost tracking program. Finally, the inspector reviewed a graph entitled "Annual DAW Generation," and noted a significant declining trend in DAW generation.

c. Conclusions

Based on this review, the inspector concluded that the licensee had a good basis for certifying that radioactive wastes intended for disposal were properly classified, described, packaged, marked, and labeled; and efforts to reduce dry active waste (DAW) generation were effective.

R1.2 Radioactive Waste/Radioactive Material Shipping Program

a. Inspection Scope (86750)

The inspectors reviewed the radioactive waste and radioactive material shipping program through a review of shipping records, and interviews with cognizant personnel.

b. Observations and Findings

The inspector randomly selected and examined six radioactive waste and six radioactive material shipping records to evaluate compliance with shipping regulations and the adequacy of shipping records. The inspector noted that the licensee takes pictures of shipping vehicles and packages to make a record of vehicle placarding, and in some cases package labeling. Methods used for loading and storage, and blocking and bracing packages are also monitored. No discrepancies in vehicle placarding, package labeling, or vehicle loading were identified. The inspector also noted that each shipping record contained radiation and contamination surveys of packages and vehicles, and appropriate shipping documentation. No significant discrepancies were identified, and shipping records were developed and maintained as required.

c. Conclusions

Based on this review, the inspector concluded that radioactive waste and radioactive material shipments were prepared and made in accordance with

applicable shipping regulations, and shipping records were adequately developed and maintained.

R1.3 Implementation of the Revised DOT Shipping Regulations

a. Inspection Scope (TI 2515/133)

The inspectors evaluated implementation of the revised 49 CFR Parts 100-179 and 10 CFR Part 71 regulations by a review of a computerized shipping program, procedures, training rosters, and through interviews with cognizant personnel.

b. Observations and Findings

A computerized radioactive waste shipping program named RADMAN was primarily used to prepare radioactive waste shipments. The inspector verified that the RADMAN program had been updated to incorporate the revised regulations. The inspector also verified that procedures used to prepare radioactive material and radioactive waste shipments had been updated to include the newly revised regulations. This included WM-PS-100, "Shipment of Radioactive Waste," Rev. 4, and WM-PS-110, "General Shipment of Radioactive Material," Rev. 2. The licensee had not yet implemented the requirement for use of the International System (SI) of units; however, this regulation is not a requirement until mid-year 1997. Finally, the inspector reviewed a training roster and noted that personnel responsible for certifying the adequacy of radioactive material shipments had been trained in the revised 49 CFR Parts 100-179 and 10 CFR Part 71 regulations.

c. Conclusions

The implementation of the revised 49 CFR Parts 100-179 and 10 CFR Part 71 regulations was effective.

R2 Status of RP&C Facilities and Equipment

R2.1 Radwaste Building

a. Inspection Scope

The inspector toured the radwaste building to evaluate radiological control boundaries, postings, contamination controls and monitoring, radioactive material control, and housekeeping. The inspector also evaluated material condition of abandoned or unused facilities and looked for signs of ground water intrusion into the lower elevation of the radwaste building.

b. Observations and Findings

The inspector examined the following areas.

Elevation	Area Description
646'	R-2, Laundry Drain Sample Tank & Pump Room
646'	R-3, Chemical Tanks
646'	R-4, Chemical Tank Pump Room
646'	R-5, A Evaporator & Condensate Area
646'	R-6, Evaporator Concentrate Sample Tank
646'	R-7, Evaporator Distillate Sample Tank
646'	R-9, B Evaporator and Condensate Area
646'	R-14, Sump Pump Area
646'	R-20, Collect & Surge Tank Pumps
646'	R-21, MCC Area
646'	R-22, Optical Surveillance and Control Area
646'	R-29, Phase Separator Pump
646'	R-34, Tank Vent Filter
646'	R-35, Decontamination Room
646'	R-36, Decontamination Room
646'	Solidification Area
646'	Sample Tank Pumps
676'	R-203, Passage - Decontamination Shop (entrance only)
676'	R-207, Sample Room
676'	R-218, Charcoal Absorber
676'	Trash Compactor Area
691'	Janitor Closet
691'	R-301, Decontamination Room
691'	R-310, Exhaust Fan Room
691'	R-313, Supply Air Fan Room
691'	Drum Storage Area

Radiological boundaries were clearly delineated and well maintained, and radiological postings were informative. All contamination monitoring equipment inspected were operational and within calibration. All radioactive material containers were appropriately labeled with dose rate information, date of survey, and initials of individual performing the survey. Work areas were well illuminated and walkways and isles were clear and free of debris. No standing water was observed, and there were no signs of ground water intrusion from areas beneath the lower elevation of the radwaste building (646' elevation). Finally, the inspector noted that the radwaste solidification system including the radwaste evaporators on 646' were no longer being used and had been taken out-of-service. The material condition of this equipment appeared very good.

c. Conclusions

Based on this review, the inspector concluded that radiological control boundaries, housekeeping, and material conditions in the radwaste building were very good.

R3 RP&C Procedures and Documentation

R3.1 Procedures

a. Inspection Scope

The inspector performed a review to determine if the licensee had maintained and approved, detailed instructions and operating procedures for all personnel involved with radioactive material and radwaste transport. The inspector gathered information by a review of procedures and discussions with cognizant personnel.

b. Observations and Findings

The inspector reviewed the following procedures.

NDAP-QA-0646, "Solid Radioactive Waste Process Control Program," Rev. 4
NDAP-QA-0640, "Conduct of Effluents Management," Rev. 2
WM-PS-100, "Shipment of Radioactive Waste," Rev. 4
WM-PS-110, "General Shipment of Radioactive Material," Rev. 2
WM-PS-160, "Radwaste Curie Calculations," Rev. 3
WM-PS-150, "10CFR61 Non-Process Waste Stream Sampling," Rev. 1
WM-PS-155, "10CFR61 Sample Shipping and Correlation Factor Determination," Rev. 2
WM-RP-011, "Waste Sluicing," Rev. 2
WM-RP-106, "Transfer and Drying Bead Resin in Pacific Nuclear Containers," Rev. 4
WM-RP-107, "Transfer and Drying Powdered Resin in Pacific Nuclear Containers," Rev. 4
WM-WI-017, "Sump Pumping," Rev. 0

Procedural guidance was available for activities involved with the preparation and shipment of radioactive wastes and radioactive materials, appropriate procedures were updated to include the revised 49 CFR Parts 100-179 and 10 CFR Part 71 regulations, and procedures were well organized, and technically accurate. No deficiencies were identified.

c. Conclusions

Management approved procedural guidance was provided for personnel involved with radioactive material and radwaste preparation and transport, appropriate procedures had been updated to included the revised 49 CFR Parts 100-179 and 10 CFR Part 71 regulations, and the quality of procedures was good.

R5 Staff Training and Performance in RP&C

R5.1 Staff Training

a. Inspection Scope (86750)

The inspectors reviewed the training and qualifications of personnel involved with the radioactive waste management program through a review of a training curriculum matrix for the radwaste management group, training records, and interviews with cognizant personnel.

b. Observations and Findings

Required training for various members of the radwaste management group was specified on Form NTP-QA-11.2C, Training Curriculum - Effluents Management, Rev. 2. This included management, supervision, foremen, health physics technicians, quality control inspectors, radwaste handlers, and warehouse workers. In addition, procedure NQAP-QA-203, "Training, Qualification and Certification of Inspection, Examination and Testing Personnel," Rev. 1, listed training and qualification requirements for individuals assigned to perform inspections, examination and testing of radioactive waste preparation and shipping activities. Training records were available for review in the training facility. Records of attendance indicated that selected individuals had completed required training for hazardous material handling, processing, and shipping. Individuals responsible for certifying the adequacy of radioactive waste shipments, including quality control personnel, had completed vendor training on the radwaste packaging and transportation regulations, and met qualification requirements.

c. Conclusions

Based on this review, the inspector concluded that appropriate training on regulations and procedures pertaining to radioactive waste handling, processing, packaging, and shipping had been provided to the radwaste staff. Furthermore, staff members were qualified to perform tasks assigned within the radioactive material/waste management and transportation program.

R6 RP&C Organization and Administration

R6.1 Organizational Changes

a. Inspection Scope (86750)

The inspector reviewed the organization and administration of the radwaste management organization. Information was gathered through interviews with pertinent personnel.

b. Observations and Findings

The licensee had implemented some staffing changes in the radioactive waste management program since the last inspection. A Health Physics - Foreman position was eliminated; responsibilities for shipping were transferred to a Health Physicist and responsibility for oversight of decontamination work was transferred to the Radwaste Supervisor - Effluents Production Services. No performance deficiencies, associated with administrative staff changes, were identified by the inspector.

c. Conclusions

The changes to the licensee's radioactive waste management program were determined to be acceptable. No violations of regulatory requirements were identified.

R7 Quality Assurance in RP&C Activities

R7.1 SSES Self Assessments

a. Inspection Scope 83750

The inspector reviewed self assessments performed in the area of solid radwaste management, and radwaste and radioactive material packaging and transport. Information was gathered thorough interviews with cognizant personnel, and by a review of audits, surveillances, and condition reports related to solid radwaste management and transportation of radioactive materials.

b. Observations and Findings

The inspector reviewed the following self assessments.

- Audit 95-114, "SSES NAS/SRC Audit of the Effluent Release and Solid Radwaste Process Control Program, 11/17/95
- Surveillance Report No. 95-11, "P-32 Analysis and In-Plant RadChem Lab Surveillance at Teledyne
- Surveillance Report No. 96-012, Free Release Practices at the Low Level Radwaste Holding Facility (LLRWHF)
- Surveillance 95-023, "Shipment of Launderable Material," 4/5/95

Audit 95-114 indicated that the solid radwaste process control programs were effectively implemented including processing, handling, and shipment of radioactive waste; training, qualification and certification of personnel; radioactive waste program quality assurance; and utilization of the low level radwaste holding facility. No significant findings requiring corrective actions were identified. However, six observations/recommendations were made. Examples included recommendations for including specific instructions in procedures for maximizing high integrity container waste volume; improving the quality of inventory tags for items stored in

the low level radioactive waste holding facility; and a recommendation to instruct health physics shipping technicians on the proper methods for documenting changes on shipping paper work. The inspector noted that procedure changes were made to address the recommended procedural enhancements, and shipping technicians were instructed on the proper method to document changes on shipping paper work.

Surveillance Report No. 95-11, indicated that Teledyne Brown Engineering (TBE) conducted P-32 analyses in accordance with governing procedures, and TBE had personnel and equipment to successfully provide 10 CFR 61 analyses.

Surveillance Report No. 96-012, identified that the potential existed for materials to be free released from the low level radwaste holding facility without the performance of procedurally required contamination surveys. In response to this, Condition Report 96-185 was initiated which resulted in a detail review of material handling and contamination control practices including a barrier analysis, determination of root causes, and corrective actions.

Surveillance 95-023, reviewed the preparation of a laundry shipment and determined that it was satisfactory with one recommendation. A recommendation was made to enhance procedure WM-PS-250, "RAMSHP-Package Characterization" to allow some relief from strict step-by-step adherence to procedural steps when characterizing radioactive material packages using the RAMSHP computer program.

c. Conclusions

Based on this review, the inspector concluded that audits and surveillances in the area of solid radwaste management, and radwaste and radioactive material packaging and transport, covered broad areas and resulted in timely and technically acceptable corrective actions.

R8 Miscellaneous RP&C Issues

R8.1 (Discussed/Closed) Violation 50-387/96-04-02; 50-388/96-04-02:

The inspector performed a review to evaluate licensee response to NRC Violation 50-387/96-04-02 & 50-388/96-04-02. The inspector discussed corrective actions taken with various members of the health physics staff, and reviewed the following document:

-- June 24, 1996, Reply to Notice of Violation 50-387/96-04-02 & 50-388/96-04-02.

The inspector verified that corrective actions described in the licensee's response letter, dated June 24, 1996, were complete. However, during the review to evaluate recurrence, the inspector noted that additional radiological posting discrepancies were documented in the station condition reporting system. Examples included the following:

CR 96-508 Unit 1 Turbine Building 676': The entrance to the D Demin Room from the E Demin Room was not posted as a high radiation area, and had dose rates of 200 mR/h.

CR 96-535 Unit 1 Turbine Building 676': An entrance to the Steam Jet Air Ejector (SJAE) Room from the spare SJAE room was blocked open and not posted as a high radiation area, and had dose rates of 1,200 mR/h.

CR 96-956 Unit 2 Reactor Building 645': An unposted radiation area was discovered at the entrance to the B Residual Heat Removal Room with dose rates of 12 mR/h.

CR 96-1056 Unit 2 Reactor Building 779': An unposted high radiation area of 400 mR/h was found originating from the HV-24511B resin inlet valve.

During the inspection, licensee staff were performing a review to evaluate the causes and significance of these occurrences, and why corrective actions for Violation 50-387/96-04-02 & 50-388/96-04-02 were not effective in preventing recurrence. The inspector noted that appropriate corrective actions were taken when radiological posting deficiencies were identified, and based on licensee reviews, no unplanned radiation exposures resulted from the radiological posting deficiencies. In addition, based on a review of condition reports, the inspector concluded that appropriate short term corrective actions were being taken to identify and correct posting deficiencies. Pending the licensee's review and evaluation of radiological posting practices and the implementation of long term corrective actions, these radiological posting deficiencies are considered an unresolved item. **URI 50-387;388/96-09-02.**

R8.2 (Closed) Violation 50-387/96-04-03; 50-388/96-04-03:

The inspector performed a review to evaluate licensee response to NRC Violation 50-387/96-04-03 & 50-388/96-04-03. The inspector discussed corrective actions taken with various members of the health physics staff, and reviewed the following documents:

-- June 24, 1996, Reply to Notice of Violation 50-387/96-04-03 & 50-388/96-04-03.

-- Health Physics Technical Basis 96-016, "Explanation of Cs-137 activity on Lancaster Truck Wash Samples

The inspector verified the corrective actions described in the licensee's response letter, dated June 24, 1996, 1996, to be reasonable and complete. No similar problems were identified. This item is closed.

R8.3 UFSAR Review

The recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR description. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected.

The inspector reviewed selected sections of Chapters 11, "Waste Disposal and Radiation Protection Systems," of the UFSAR, pertaining to radiological controls, to evaluate the accuracy of the UFSAR regarding existing plant conditions and practices.

The inspector noted that UFSAR Section 11.6.11, "Effluent Monitoring," stated that "the low level radwaste holding facility (LLRWHF) will be used only to store solidified waste and radioactive materials. Contrary to this statement, condition report (CR) no. 96-185, initiated as a result of surveillance 96-12, identified that clean materials such as desks, chairs, and file cabinets were being stored at the LLRWHF. Although, by itself, this does not present a significant safety concern, the practice of storing clean materials in the LLRWHF increases the chances that materials could be released from the facility without a proper radiological survey. In response to this finding, Effluents Management terminated the practice of storing non-radioactive materials at the LLRWHF, and established a target date of December 31, 1996 for the survey and removal of all non-radioactive materials stored at the LLRWHF.

c. Conclusions

The licensee identified and stopped the practice of storing non-radioactive materials in the low level radwaste holding facility (LLRWHF). This practice was in direct conflict with Section 11.6.11, of the UFSAR. The licensee plans to survey and remove all non-radioactive materials stored in the LLRWHF by December 31, 1996. This is considered an unresolved item. **(URI 50-387;388/96-09-03)**

S4 Security and Safeguards Staff Knowledge and Performance

S4.1 Search And Temporary Facility Controls

a. Inspection Scope (71750)

The inspector observed the implementation of security practices and discussed several issues involving the conduct of security activities with SSES security officers and management. Two specific issues that were discussed with SSES security management were searching bulk shipments and lighting of temporary structures.

b. Observations and Findings

Security personnel were observed to be implementing the security plan and SSES security practices. Security management was observed supervising the implementation of the plan and when interviewed were able to demonstrate a detailed knowledge of the plan.

c. Conclusions

Security personnel and management demonstrated a good understanding of the security plan. During the performance of bulk shipment searches, the licensee was following its plan. With respect to the lighting of temporary structures, the licensee's definition of a temporary structure is different from standard industry practice. Given the specific definition of a temporary structure established by the licensee, the security plan was being followed. Aspects of the above issues that were considered weaknesses by the inspector were communicated to the licensee.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 9, 1996. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 NRC Management Meeting Regarding Engineering Issues

Mr. James T. Wiggins, Director, Division of Reactor Safety, Region I, visited the licensee's corporate headquarters, in Allentown, PA, on August 20, 1996. Mr. George Jones, VP - Nuclear Engineering, invited Mr. Wiggins to discuss engineering topics of mutual interest.

In addition to Mr. Jones, the following licensee engineering managers participated in the discussions:

Glenn Miller, Manager - Nuclear Engineering
Robert Saccone, Manager - Nuclear Modifications
Howard Palmer, Manager - Nuclear Systems engineering
Michael Simpson, Manager - Nuclear Technology
John Kulick, Manager - Nuclear Fuels
James Kenny, Manager - Licensing

The specific topics discussed were as shown in Attachment A to this report.

No regulatory issues were discussed other than the schedule for an upcoming motor-operated valve testing program (Generic Letter 89-10 closeout) inspection and general discussion about NRC implementing an architect-engineer inspection.

X3 NRC Management Meeting Regarding Radiological Control Issues

An NRC Management meeting was held with representatives from Pennsylvania Power and Light Company, on August 29, 1996, at 10:00 a.m., in the NRC Region I - Public Meeting Room. The purpose of the meeting was to discuss the status of the radiological controls program at Susquehanna and recent indications of an apparent decline in performance. Specific areas discussed included radiological control deficiencies identified in NRC Inspection Nos. 50-387/96-04 and 50-388/96-04; reasons for the recent increase in the number of condition reports being written in the area of radiological controls; and steps that are being taken to evaluate the significance of Condition Reports and correct identified problems. An outline of the PP&L presentation is provided as Attachment B to this report.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 60851:	Design Control Of ISFSI Components
IP 60853:	On-site Fabrication Of Components And Construction Of An ISFSI
IP 62703:	Maintenance Observation
IP 64704:	Fire Protection Program
IP 71707:	Plant Operations
IP 73051:	Inservice Inspection - Review of Program
IP 73753:	Inservice Inspection
IP 83729:	Occupational Exposure During Extended Outages
IP 83750:	Occupational Exposure
IP 86750:	Solid Radwaste Management and Transportation of Materials
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92902:	Followup - Engineering
IP 92903:	Followup - Maintenance
IP 93702:	Prompt Onsite Response to Events at Operating Power Reactors
TI 2515/133:	Implementation of Revised 49 CFR Parts 100-179 and 10 CFR Part 71

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-387;388/96-09-01	EEI	Compliance With TS Action Statement For Containment Isolation (M1.2)
50-387;388/96-09-02	URI	High Radiation Area Posting Discrepancies (R8.1)
50-387;388/96-09-03	URI	Storing Clean Materials in the LLRWHF in Conflict with UFSAR Section 11.6.11 (R8.3)

Closed

50-388/95-08-01	DEV	Loss of Unit 2 Non-Vital Instrument UPS (O8.1)
50-387/96-005-00	LER	Isolation of Both LOOPS of Containment Radiation Monitors (O8.2)
50-387;388/96-12-02	URI	Supplemental LERs Not Submitted by Commitment Date (O8.3)
50-387;388/96-04-02	VIO	Improper Disposal of Radioactive Materials Procedure (R8.1)
50-387;388/96-04-03	VIO	Disposed of Licensed Radioactive Material Inappropriately (R8.2)

Discussed

50-387;388/96-08-05	EEI	Inconsistent Use of Status Control Tags (O1.4)

LIST OF ACRONYMS USED

AR	Alarm Response
AUS	Assistant Unit Supervisor
CFR	Code of Federal Regulations
DAW	Dry Active Waste
DOT	Department of Transportation
FSAR	Final Safety Analysis Report
gpm	gallons per minute
HCU	Hydraulic Control Unit
HSM	Horizontal Storage Modules
IFI	Inspection Follow-Up Item
IFS	Inspection Follow-Up System
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
ISI	In-Service Inspection
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLRWHF	Low Level Radwaste Holding Facility
MD	Management Directive
mR	milliRoentgen
mR/h	milliRoentgen per hour
NCV	Non-Cited Violation
NMSS	Office of Nuclear Material Safety and Safeguards
NOV	Notice of Violation
NPO	Nuclear Plant Operator
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OE	Office of Enforcement
PCO	Plant Control Operator
PP&L	Pennsylvania Power and Light
PPR	Plant Performance Review
RHR	Residual Heat Removal
RP	Radiation Protection
RP&C	Radiological Protection and Chemistry
SCT	Status Control Tags
SJAE	Steam Jet Air Ejector
SRP	Standard Review Plan
SSES	Susquehanna Steam Electric Station
SSSI	Seismic Soil Structure Interaction
TI	Temporary Instruction
TS	Technical Specification
TSAR	Technical Specification Action Request
TSI	Technical Specification Interpretation
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
US	Unit Supervisor
VFS	Vectra Fuel Services
VIO	Violation
WA	Work Authorization

Pennsylvania Power & Light Company
Nuclear Engineering

Meeting with James T. Wiggins, NRC Region I,
Director - Division of Reactor Safety

August 20, 1996

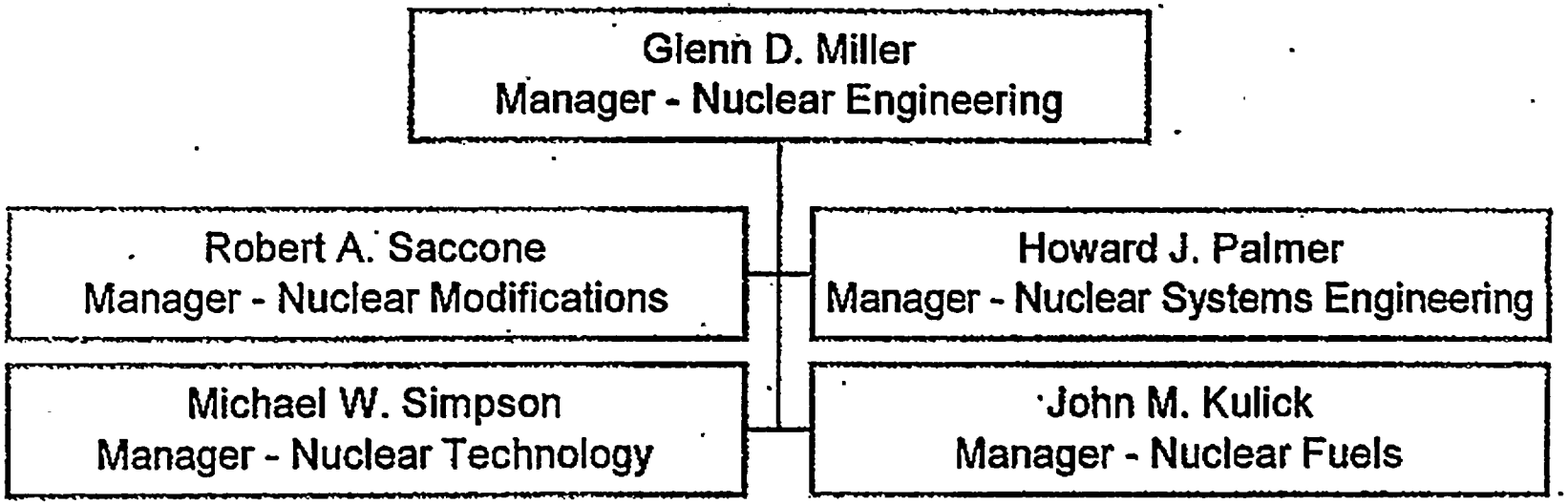
Agenda

- Introduction and Overview
- Management Perspective
- Engineering Organization & Mission
- Key Topics
- Engineering Applications

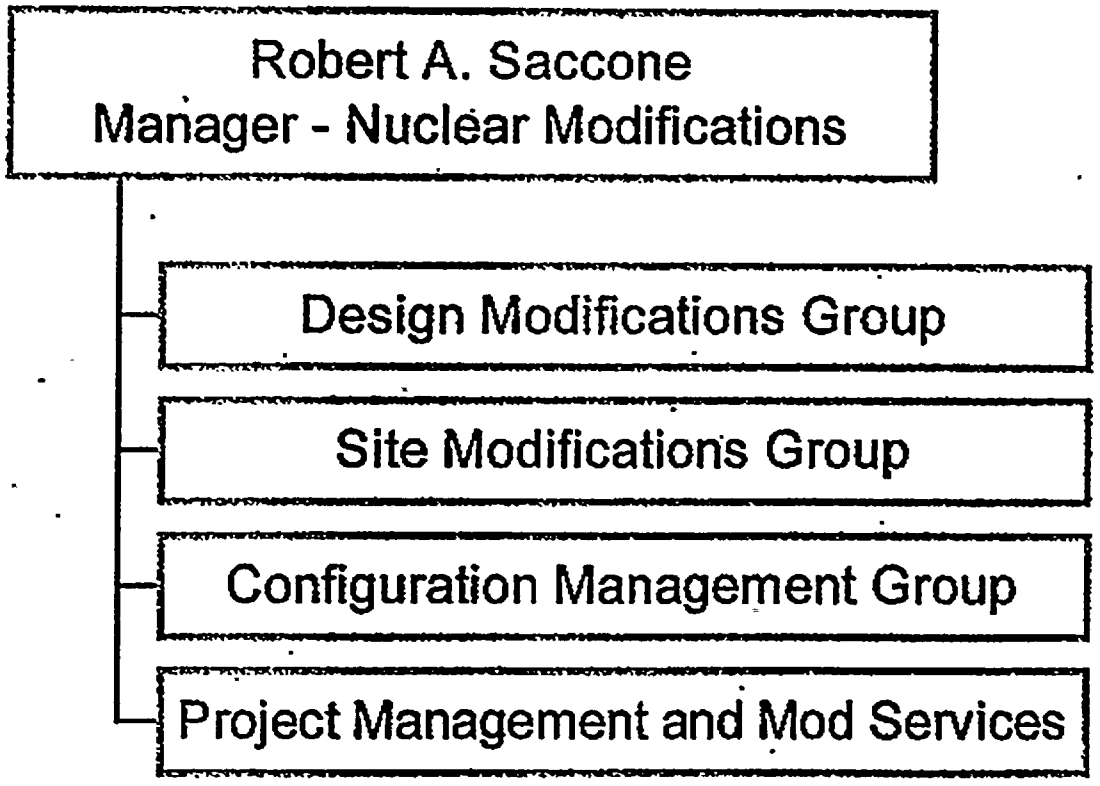
Engineering Organization and Mission

- Integration of Engineering in Nuclear Department activities
- Engineering Review Committee
- Engineering assessments
- Engineering training program
- Involvement in safety oversight committees:
  - Plant Operations Review Committee
  - Susquehanna Review Committee
  - Nuclear Oversight Committee

Nuclear Engineering



Nuclear Modifications



Nuclear Modifications

- Mission
  - To enhance the safety, performance and reliability of SSES through the development, management and implementation of modifications, plant problem resolution and projects in a cost effective manner;
  - To safely and effectively manage the SSES design configuration information asset.

Nuclear Modifications

- Design Modification Group:
  - Primary focus is on longer term design and projects.
  - Strong interface with Site Modifications Group and SSES management.
  - Accountability for design (including A/E) through installation.
  - Design engineer in field.
  - A/E contracts for supplemental services with Stone & Webster and Parsons Power.

Nuclear Modifications

- Site Modification Group:
  - Primary focus is on minor modifications and day to day plant support.
  - Strong interface with Site groups and SSES management and Allentown Design Modifications Group.
  - Customer-oriented. Easy access. Fast response.
  - Station welding and ASME code repair programs.
  - Cable raceway, tubing & support design for all modifications.
  - Field engineering support.

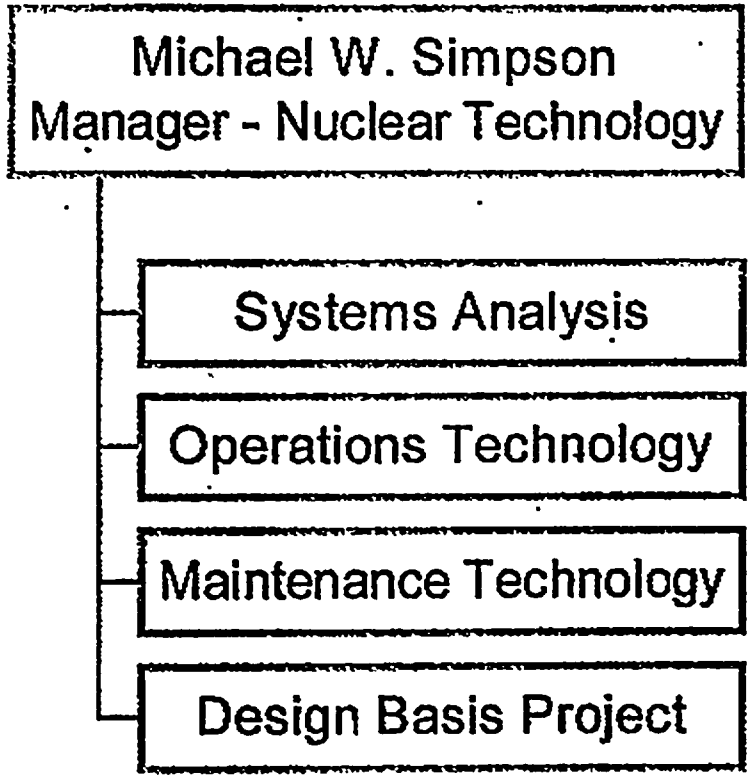
Nuclear Modifications

- Project Management and Mod Services:
  - Provide project management function for large or complex engineering projects.
  - Cost/benefit analysis.
  - Design schedules and interface with installation schedules.
  - Long term planning.

Nuclear Modifications

- Nuclear Configuration Management:
  - Drafting services for all Nuclear Department.
  - Resolution of configuration management anomalies.
  - Responsible for configuration control program.
  - Responsible for SSES drawings and much design data.

Nuclear Technology



Nuclear Technology

- Mission:
  - To support and enhance the safety, performance and reliability of Susquehanna SES through the development and implementation of technical programs, technical problem solutions and technical innovations.

Nuclear Technology

- Systems Analysis:
- Provide rigorous analytical capability in support of plant operations in the areas of:
  - Civil/structural/piping analyses
  - Thermohydraulic analyses
  - Mechanical engineering
  - Electrical engineering
  - Probabilistic risk assessment/reliability

Nuclear Technology

- Engineering Technology:
  - Design Basis Documentation project
  - Operations support
  - Nuclear Information System

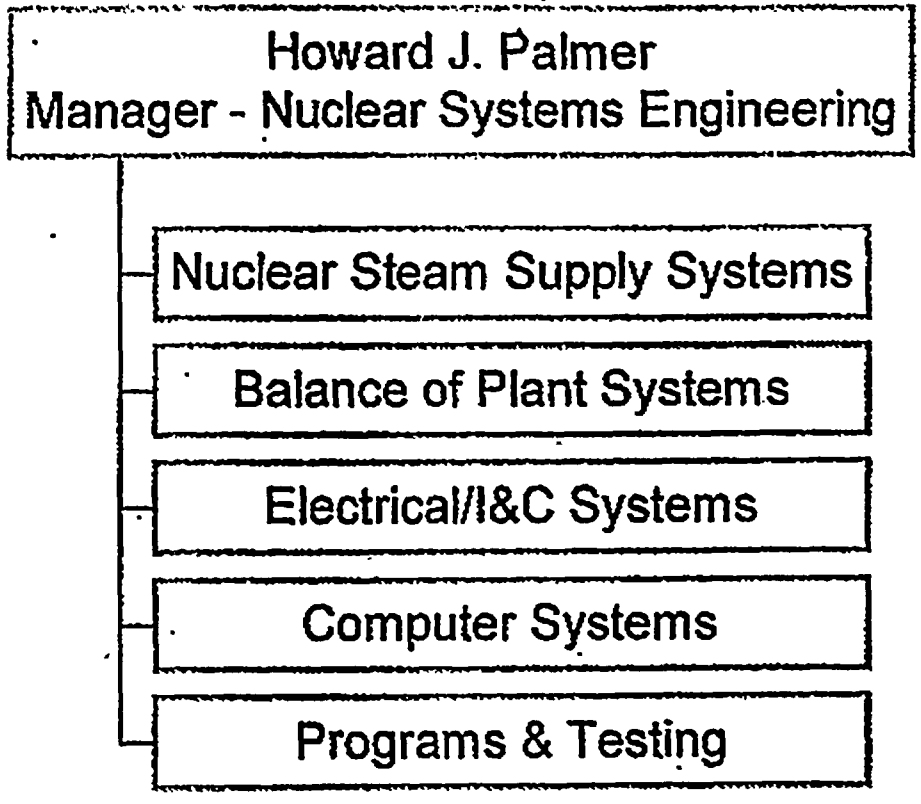
Nuclear Technology

- Maintenance Technology:
  - NDE program & implementation
  - Valve engineering
  - Metallurgical services
  - Equipment qualification program
  - PM program optimization

Nuclear Technology

- Operations Technology:
  - Radiological services
  - Environmental services
  - Chemistry services
  - Human factors engineering

Nuclear Systems Engineering



Nuclear Systems Engineering

- Mission:
  - To optimize plant systems throughout the lifetime of SSES by monitoring plant systems and providing direct engineering support to Operations and Maintenance;
  - To maintain engineering programs, the plant process computer and simulator computer in a high state of readiness.

Nuclear Systems Engineering

- NSSS, BOP, ELEC/I&C Groups
  - Operations support
  - System performance monitoring
  - Maintenance support
  - Modifications support
  - Deficiency management
  - Engineering and design activities

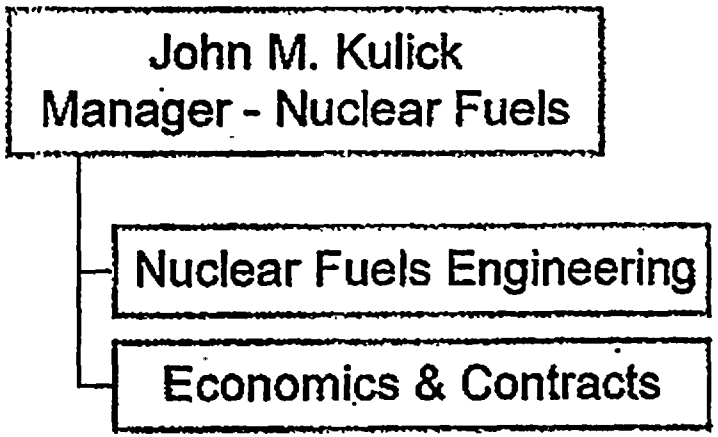
Nuclear Systems Engineering

- Computer Systems:
  - Design control for hardware and software
  - Maintenance of hardware and software
  - Configuration control

Nuclear Systems Engineering

- Programs & Testing:
  - Maintain engineering programs
  - Maintain IST programs
  - Provide civil engineering support

Nuclear Fuels



Nuclear Fuels

- Mission:
  - To provide quality fuel designs for safe, economic, reliable operation of SSES;
  - To provide a reliable, economic supply of fuel for SSES;
  - To assist station personnel in day-to-day operation of the fuel.

Nuclear Fuels

- Nuclear Fuels Engineering
  - Fuel design & licensing
  - Fuel reliability program
  - Plant operations support
  - Implementation of advanced fuel designs
  - Implementation of POWERPLEX-II core monitoring system
  - Transition to 24 month cycle

Nuclear Fuels

- Economics & Contracts
  - Fuel procurement
    - » Uranium
    - » Conversion
    - » Fabrication
  - Fuel cost analyses

Key Activities

- Design Basis Documentation Project
- Current Licensing Basis Project
- 24 MOC/Improved Tech Specs
- ECCS Suction Strainers
- Spent Fuel Storage
- Reactor Vessel Integrity
  - Hydrogen Water Chemistry
- Engineering Inspection Issues
- Application of Risk Assessment
- Maintenance Rule

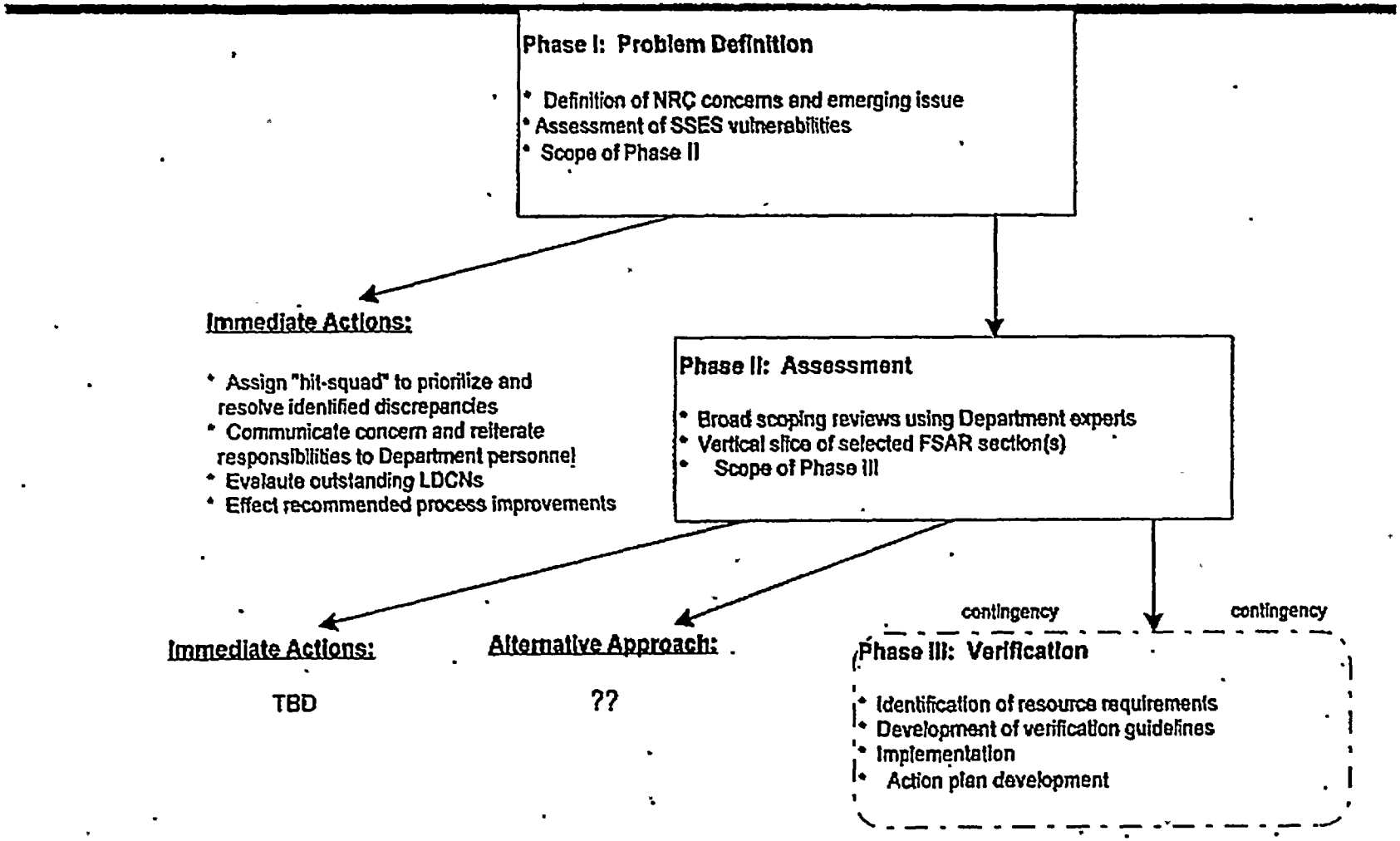
DBD Project

- Development and validation of Design Basis Documents for systems, topics and structures.
- SMARTS electronic access to DBDs, DBD references and licensing basis documents.

Current Licensing Basis Project

- Characterize the "health" of the CLB and implement immediate actions, where warranted.
- Focus the problem such that enhancement actions can be effectively and efficiently executed.
- Effect process enhancements to ensure continued CLB conformance.
- Perform assessments consistent with NEI efforts.

EVALUATION OF SSES LICENSING BASIS



Current Licensing Basis Status

- Phase I assessment complete
- Project plan developed
- Phase II immediate actions initiated
  - Procedure changes
  - Discrepancy dispositions
  - Communications plan
  - Licensing principles training
- Phase II assessment initiated
  - Scoping reviews underway
  - Vertical slice reviews ongoing

CLB Status

- Analysis of initial discrepancies
  - 46% required no further action
  - 31% required document change
  - 5% require additional investigation
  - 3% required Condition Report
  - 15% remain to be analyzed
- FSAR Power Uprate revision submitted May 1996
  - Involved substantial FSAR review

CLB Summary

- Recognition of significance of issue
- Continuing confidence in the SSES CLB
- CLB project is phased and focused
  - immediate actions
  - assessment and review
- Involved in industry efforts to resolve generic issues

24 MOC/Improved Tech Specs

- Convert Current Tech Specs to Improved Tech Specs
  - Licensing submittal August 2, 1996
  - Implement September 1997
- Extend refueling cycles to 24 months
  - Unit 2 implementation Spring 1997
  - Unit 1 implementation Spring 1998
- Implement advanced fuel design

ECCS Suction Strainers

- Identified vulnerability to issue in April 1993
- Acted aggressively to address the issue
- Leader in industry effort to develop resolution process

ECCS Suction Strainers

- Containment debris sources quantified and controls enhanced
- Modifications completed in 1993/94 to replace fiber insulation with metallic insulation (RMI)
  - fiber source reduced in drywell
- Scoping passive strainer replacement on a fast-track basis for Unit 2 Spring 1997 outage

Spent Fuel Storage Project

- Utilize the Vectra NUHOMS system (horizontal storage technology)
- Pad located within protected boundary
- Pad sized to store fuel out to year 2010 expandable to life of plant
- Project modifications include pad, fencing, lighting and temperature

Spent Fuel Storage Project

- Public involvement - since September 1993
  - Continuous communication & feedback
  - Mailings, citizens committee meetings, EPZ meetings, tours
- Project quality
  - Integrated QA plan
  - Industry event review
- Project status
  - Pad construction in progress
  - Fuel moves: August 1997

Reactor Vessel Integrity

- Core shroud
  - Baseline complete U1 & U2
  - Re-inspection - U1 - 9/96, U2 - 3/97
- Core spray piping & spargers
  - Baseline via enhanced VT-1 U1 - 9/96, U2 - 3/97
- Core shroud support (H8 & H9)
  - Baseline via enhanced VT-1 complete U1 & U2
  - Re-inspect HP via UT - U1 - 3/98, U2 - 3/97

Hydrogen Water Chemistry

- Implement moderate hydrogen injection to mitigate IGSCC in lower vessel internals
- HWC system
  - Cryogenic H2/O2 storage
  - Programmable logic injection control
  - Plant impact assessments
- Dose mitigation plans
  - Condensate filtration system
  - Shielding & work practice changes

Engineering Inspection Issues

- HPCI & RCIC injection valves
  - Unit 2 valves modified 7/96
- Seismic monitors relocated 7/1/96
- RWCU leak detection
  - LER submitted 5/96
  - Tech Spec amendment submitted 6/96
- SGTS single failures
  - LER closed 5/96
  - FMEA completed 7/96

Application of Risk Assessment

- Application of SSES IPE to plant activities:
  - Safety assessment of planned on-line work windows
  - Risk impacts related to selected plant events
  - Emergency operating procedure development and verification
  - Maintenance rule scoping
  - Work scheduling consideration of risk

Maintenance Rule

- Team initiated in spring 1994
- Worked closely with industry: NEI & MRITE
- System engineer is key to program
- Program incorporated in procedures and design specifications
- Quarterly reviews by system engineers
- Systems with improvement plans

Engineering Applications

- Plant Integrated Computer System
- POWERPLEX core monitoring system
- DBD/SMARTS
- Recirculation piping vibration
- Fuel pool thermal model
- Three dimensional piping models

AGENDA

- **Introduction and Management Perspective**.....G. J. Kuczynski
  Plant Manager- Susquehanna SES

- **Assessment of Health Physics Issues**
  Condition Report/Corrective Action and Employee Concerns Program .....W. E. Burchill
  Manager-Nuclear Assessment Services

- **Health Physics Assessments, Evaluations, and Plan**..... A. F. Iorfida
  Manager - Nuclear Plant Services

- **Summary**.....G. J. Kuczynski

PP&L MANAGEMENT PERSPECTIVE

- PP&L has a Strong Record Regarding the Identification and Resolution of Operational Issues at Susquehanna. Our Standards Include:
  - » Questioning Attitude
  - » Priority Based on Safety Significance
  - » High Quality Technical Work
  - » Management Involvement

PP&L MANAGEMENT PERSPECTIVE

- Health Physics Program Strong
  - » Station ALARA Program
  - » Comprehensive Dose Evaluation Process
    - Respiratory Protection
    - Worker Awareness
  - » Waste Reduction Programs
  - » Improvements via Industry Benchmarking

PP&L MANAGEMENT PERSPECTIVE

- Independent Comprehensive Health Physics Assessments Performed
  - » Root Cause Analysis of Events
  - » Independent Safety Evaluation Services (ISES) Investigation
  - » Causal Factor Analysis
  - » Independent Staffing Study
  - » Independent Organizational Assessment (On-Going)

PP&L MANAGEMENT PERSPECTIVE

- Need for Health Physics Program Enhancements Identified
  - » Supervisory/Worker Interface
  - » Threshold for Condition Report Initiation
  - » Procedural Controls
  - » Posting/Material Controls
  - » Continue to Evaluate Condition Reports to Improve Effectiveness of Program

PP&L MANAGEMENT PERSPECTIVE

- Aggressive Comprehensive Corrective Actions Being Taken
  - » Enhanced Supervisor/Worker Interface
    - Leadership Academy
    - Emphasis on Openness
    - Personnel Changes
  - » Reinforce Open Climate
  - » Enhanced Employee Concerns Program
  - » Identified Causal Factors
  - » Initiated Organizational Assessment
  - » Resolved Technical Issues

INTRODUCTION OF MANAGER - NUCLEAR ASSESSMENT SERVICES

- W. E. Burchill, Manager- Nuclear Assessment Services to Address
  - » Assessment of Health Physics Issues
  - » Health Physics Technician Concerns
  - » Independent Safety Evaluation Services Investigation/Conclusions
  - » Employee Concerns Program - HP Concern
  - » Health Physics Condition Report/Corrective Action Efforts

ASSESSMENTS OF RP ISSUES

- Independent Investigation
  - » Have the HP Technicians' concerns been validated?
- Employee Concerns Program
  - » Has the environment for initiating CRs improved?
- Corrective Action Process
  - » Why are there so many RP CRs in 1996?

HP TECHS' CONCERNS

- Procedures
- RCA (Radiological Controlled Area) Egress Point Monitoring
- Release of equipment from RCA
- Briefing of workers on rad conditions
- Radiation Surveys
- Behavior of Supervision/Management
- Contractors
- HP Tech support of E-plan
- Planned HP Tech staff reductions

INVESTIGATION ACTIONS

- Technical concerns investigated by
  - » Interviews with HP Techs, workers, and management
  - » Real-time surveillances
  - » Reviewing documentation and records
  - » QA audit of HP procedures
- Results given to Management (HP & above) as soon as they were validated
- Investigation report provided to NRC Sr. Resident Inspector

INVESTIGATION ACTIONS

- Staffing concerns were investigated by
  - » Reviewing HP management staffing evaluations from 1986 through 1995
  - » Determining work practice changes
  - » Comparing to practices at peer utilities
  - » Examining HP management reasoning for staff changes
  - » Confirming changes already made in HP Tech positions

INVESTIGATION CONCLUSIONS

- Valid bases existed for concerns in all technical topics
- Most concerns were of relatively low safety significance
- There have been no personnel exposures above limits and no contamination releases to the public
- Formal recommendations of improvements were provided to HP management
- Pending staffing changes will not degrade radiological safety

ENVIRONMENT IN HP FOR WRITING CRs

- HP Techs told ISES investigation they were discouraged from writing CRs
- This was promptly communicated to HP management
- HP management took several corrective actions
- HP Techs were interviewed under ECP to determine if corrective actions were effective

ECP CONCLUSIONS

- The climate for HP Techs to write CRs has improved
- No HP Tech (interviewed) has been recently told not to write a CR
- HP Techs still perceive that indirect actions discourage writing CRs
- HP Techs feel Workers (Maintenance) exert peer pressure not to write CRs
- HP Techs have a growing confidence in the CR program to resolve problems

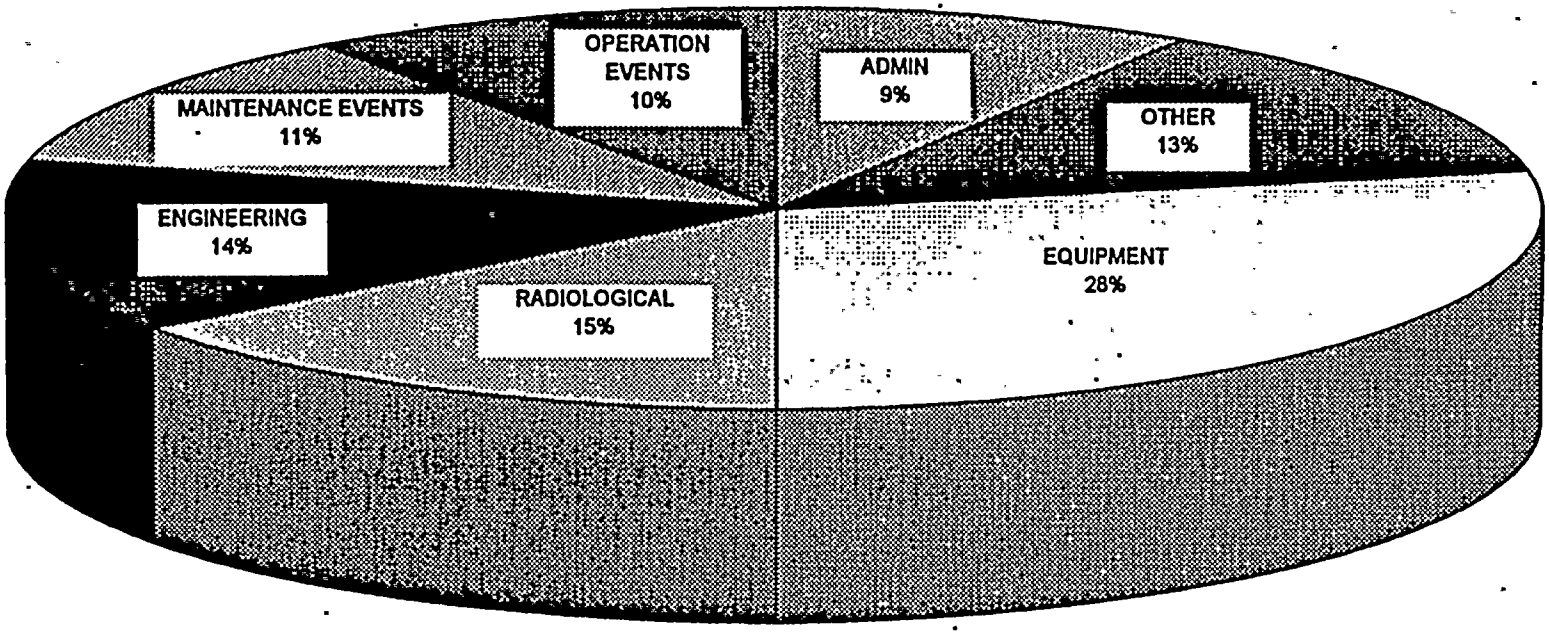
ECP RECOMMENDATIONS

- Provide counseling/training to HP supervision on potential impacts of indirect actions
- Provide Employee Concerns training to Maintenance personnel before EOY 96
- Conduct independent assessment of HP climate during 97Q2

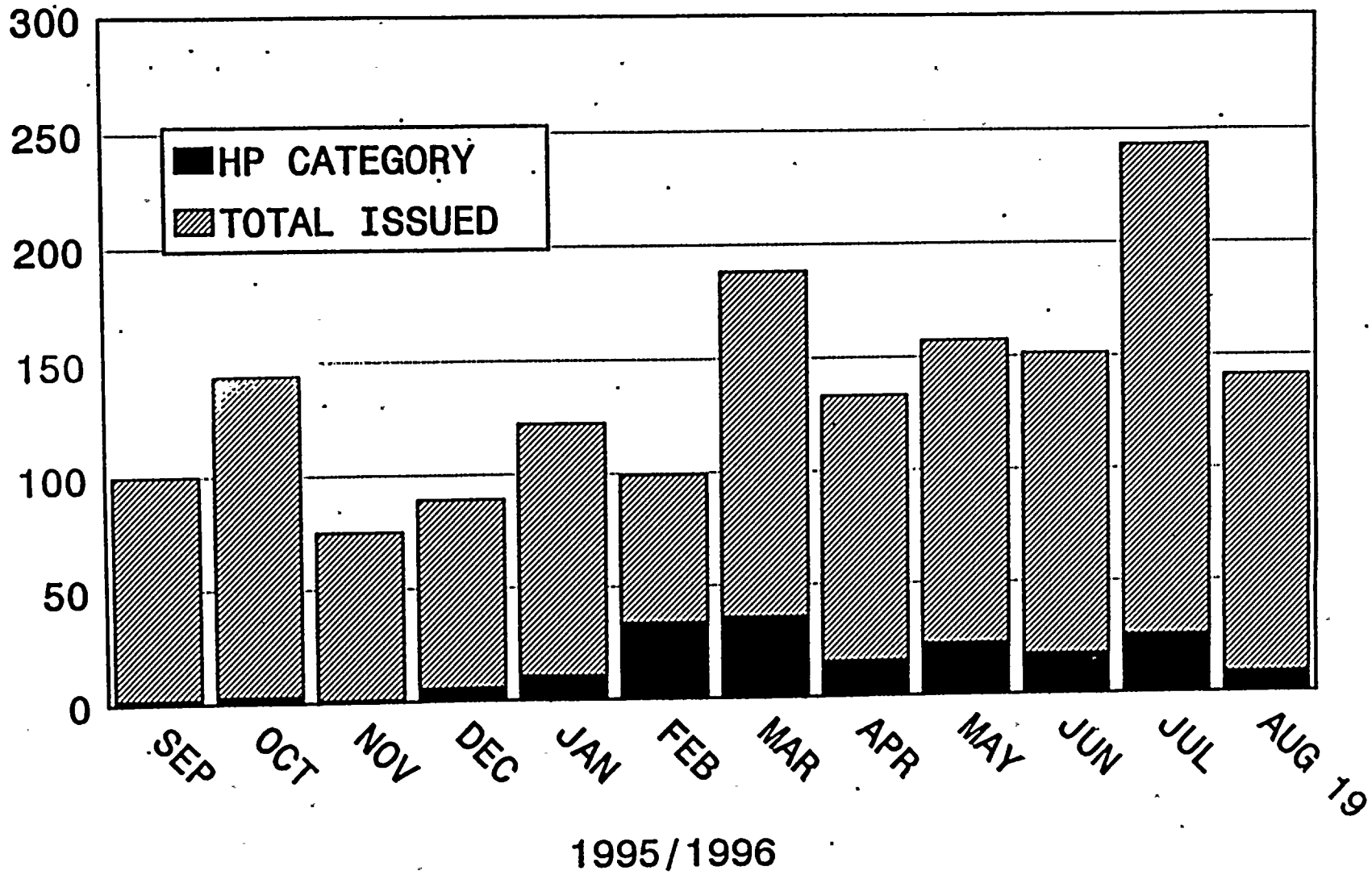
CORRECTIVE ACTION PROCESS

- Condition Report (CR) process implemented 3/5/95
- HP Techs fixed problems but didn't write CRs
- Manager - Nuclear Plant Services encouraged HP Techs to write CRs
- HP Supervisor coached HP foremen on proper response to CRs
- Nuclear Dept. Mgmt. lowered threshold for CRs

BREAKDOWN OF 1250 CONDITION REPORTS BY CATEGORY



CR'S ISSUED / HP CATEGORY



CORRECTIVE ACTION CONCLUSIONS

- HP Techs have always identified technical issues & fixed them
- Environment for HP Techs to initiate CRs has significantly improved
- HP Techs are using the CR process as requested by management
- HP Techs are learning how to use the CR process
- Fraction of HP CRs is not out-of-proportion with overall CR population
- Trend of number of HP CRs follows trend of total CR population

ASSESSMENTS OF RP ISSUES

- Independent Investigation
  - » Have the HP Technicians' concerns been validated?
- Employee Concerns Program
  - » Has the environment for initiating CRs improved?
- Corrective Action Process
  - » Why are there so many RP CRs in 1996?

INTRODUCTION OF MANAGER - NUCLEAR PLANT SERVICES

- A. F. Iorfida, Manager-Nuclear Plant Services to Address
  - » Technical Issues
  - » Management/Supervisory Issues
  - » Health Physics Plan
  - » Condition Report Significance Reviews

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Root Cause Analyses Addressed Technical Issues
  - » Multidisciplined Effort
  - » Performed Investigation
  - » Determined Root Causes
  - » Identified/Implemented Corrective Actions

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Technical Corrective Actions
  - » Counseling/Training
  - » Increased Communications
  - » Upgraded Posting/Survey Process
  - » Procedural/Administrative Upgrades
  - » Enhanced Supervisory Oversight

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Independent Assessments Addressed Cultural/Organizational Issues
  - » Independent Safety Evaluation Services (ISES) Investigation
  - » Health Physics Staffing Studies
  - » Causal Factor Analysis
  - » HP Issues Response Team
  - » Ongoing Organizational Assessment (Based on Recommendations from Causal Factor Analysis)

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Health Physics Staffing Studies
  - » Internal Study
    - – Reduction in HP Technician Staff Did Not Degrade Existing Program
  - » ISES Investigation
    - – Validated Assumptions of the Internal Study
  - » Independent Outside Assessment
    - – Substantiated Conclusions

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Causal Factor Analysis Development
  - » Issues Resulted From Root Cause Analysis, ISES Investigation, Outside Assessments
  - » Issues Developed by Management Team
  - » Common Themes Identified as Causal Factors Issues

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Causal Factor Analysis Issues
  - » Culture and Work Environment
  - » Management Policies, Expectations, Oversight
  - » Consistency of Operating Practices
  - » Radiation Protection Program Strategy
  - » Process Weakness
  - » Willingness to Raise Issues

HEALTH PHYSICS ASSESSMENTS AND EVALUATIONS

- Organizational Assessment
  - » Utilizes Findings of Causal Factors Analysis
  - » Performed By Outside Organizational Expert
  - » Process Utilizes
    - Confidential Interviews with HP Technicians
    - Confidential Interviews with HP Supervisors
    - Validation of Interview Themes
    - Management Self-Assessment and Action Planning

HEALTH PHYSICS PLAN

- Health Physics Plan Implements Recommendations of Studies and Assessment
- Health Physics Plan Elements
  - » Enhance Health Physics Supervision
    - Personnel Changes Made
    - Augment HP Supervision
    - Realigned Supervisory Reporting Relationship
    - Implemented a Crew Concept
    - Leadership Academy

HEALTH PHYSICS PLAN (Cont'd)

- Health Physics Plan Elements (Cont'd)
  - » Address HP Technician Concerns
    - Validated HP Technician Concerns Noted In ISES Report
    - Performed an Independent Staffing Analysis
    - Separated Employee Concerns Program Process from ISES
    - Investigated Environment for Writing Condition Reports
    - Performing Organizational Assessment
    - Taking Action to Change Culture Related to the Radiation Protection Program

HEALTH PHYSICS PLAN (Cont'd)

- Health Physics Plan Elements (Cont'd)
  - » Enhance Communications to HP Technicians
    - – Responded to HP Technician Concerns with ISES Report
    - – Use of Organizational Assessment Process

HEALTH PHYSICS PLAN (Cont'd)

- Health Physics Plan Elements (Cont'd)
  - » Provide for Ongoing Health Physics Program Enhancements
    - – Improve Work Scheduling that Requires HP Support
    - – Evaluate HP Technician Crew Rotation Scheduling
    - – Evaluate Worker Self-Monitoring Process
    - – Investigate HVAC in Turbine/Reactor Building

CONDITION REPORT SIGNIFICANCE REVIEW

- Evaluation of Recent Condition Reports
  - » Significance of Event
  - » Corrective Actions
  - » Conclusions

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- High Radiation Area
- Radiation Area
- Radioactive Material Controls
- Worker Monitoring

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- High Radiation Area
  - » Most Condition Reports Identified as a Result of Routine Survey Program
    - – No radiological significance
    - – Below Reporting Threshold of Previous Deficiency Process
  - » Non-Routine Condition Reports
    - – Low dose significance
    - – Promptly identified

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- High Radiation Area (Cont'd)
  - » Actions Taken
    - Require independent First Line Supervisory walkdown
    - Reviewed standard work plans and RWPs
  - » Conclusions
    - Corrective Actions were effective
    - Lower threshold of reporting is providing additional opportunities for improvement

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- Radiation Area
  - » None are safety or dose significant
  - » Identify work practice issues within HP or other work groups
  - » Below reporting threshold of previous deficiency process
  - » Action taken
    - – Performed Human Factors Reviews
    - – Issue Rad Safety Notes to work groups
    - – Instituted use of stanchion floor stickers

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- RADIOACTIVE MATERIAL CONTROLS
  - » HP Technician interventions at RCA exit
  - » Receipt of contaminated material

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- RADIOACTIVE MATERIAL CONTROLS
  - » Actions Taken
    - Simplified definition of personal items
    - Required all personal items to be removed from pockets and surveyed
    - Additional training conducted
    - Additional HP Technician coverage assigned to Unit #2 exit
    - Further enhanced material receipt practices
  - » Conclusion
    - Corrective Actions were extremely effective

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- WORKER MONITORING
  - » Personnel entering RCA without a pocket alarming dosimeter
    - – no dose significance
    - – self identified
    - – improving trend

CONDITION REPORT SIGNIFICANCE REVIEW (Cont'd)

- WORKER MONITORING
  - » Actions Taken
    - – Coach and counsel each individual
    - – Issued Rad Safety Note to all work groups
    - – Installed additional work aids
    - – Ordered electronic turnstile
  - » Conclusions
    - – No safety significance of the events
    - – Turnstiles will provide long-term defense in depth
    - – Provides Opportunity to Preclude a Serious Event

HEALTH PHYSICS CONCLUSIONS

- Technical Issues
- Management/Supervisory Issues
- Health Physics Plan
- Condition Report Significance Reviews

SUMMARY

- PP&L Has a Strong Program for Identification/Resolution of Issues
- Health Physics Program at Susquehanna Is Strong
  - » Good Overall Exposure Trends
  - » Priorities Appropriately Established and Addressed
- Independent Comprehensive Health Physics Assessments Performed
- Need for Health Physics Program Enhancements Identified

SUMMARY (Cont'd)

- Aggressive Comprehensive Corrective Actions Being Taken
  - » Enhanced Supervisor/Worker Interface
  - » Enhanced Employee Concerns Program
  - » Reinforced Open Climate to Raise Concerns
  - » Identified Causal Factors
  - » Initiated Organizational Assessment
  - » Resolved Technical Issues
  - » Comprehensive Health Physics Plan