March 15, 2000

Mr. Ulrich Mueller
Ms. Ueli Mueller
Greenpeace
Postfach CH-8031
Zurich, Switzerland

Dear Mr. and Ms. Mueller:

I am responding to your electronic mail of January 17, 2000, to the U. S. Nuclear Regulatory Commission's (NRC) Office of Public Affairs requesting information on the December 17, 1999, shutdown of the Susquehanna Steam Electric Station, Unit 2. You referred to a December 23, 1999, *Nucleonics Week* article that indicated that the NRC would evaluate the shutdown to determine if a generic issue exists. You requested information regarding the shutdown, whether other facilites have experienced similar problems, and whether the NRC has initiated generic action related to these issues. Responses to your questions are provided in the enclosure to this letter.

I trust that you will find the enclosed information responsive to your questions. Should you have any questions or comments regarding these matters, please contact Mr. Robert Schaaf, the NRC Project Manager for the Susquehanna Steam Electric Station, at 1-301-415-1312, or via electronic mail at rgs@nrc.gov.

Sincerely,

/RA/

Elinor G. Adensam, Director
Project Directorate 1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Enclosure: Responses to Questions

cc w/encl: Mr. Sabyasachi Chakraborty
Head of Safety Research
and International Programs
Swiss Federal Nuclear Safety Inspectorate
Postfach CH-5232
Villigen-HSK, Switzerland

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Ms. Ueli Mueller
Greenpeace
Postfach CH-8031
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Enclosure: Responses to Questions

cc w/encl: Mr. Sabyasachi Chakraborty
Head of Safety Research
and International Programs
Swiss Federal Nuclear Safety Inspectorate
Postfach CH-5232
Villigen-HSK, Switzerland

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OFFICIAL RECORD COPY

Response to Questions Regarding the December 17, 1999

Shutdown of the Susquehanna Steam Electric Station, Unit 2

Question 1

What kind of material was affected?

Response

The Susquehanna Steam Electric Station Final Safety Analysis Report identifies the instrumentation line material as austenitic stainless steel.

Question 2

Has the NRC released a publication addressing this specific event?

Response

NRC Inspection Report No. 05000387/1999012, 05000388/1999012, issued on January 24, 2000, provides a summary of the Unit 2 shutdown and the licensee's actions to identify and correct the source of the leak. A copy of the inspection report is attached to this response. The summary of the shutdown and licensee actions is on page 2 of the report.

Question 3

What findings caused the NRC to examine the event for potential generic implications?

Response

It is the policy of the NRC to systematically review operating data from a range of sources to identify potential generic issues. Operational data is screened each business day to evaluate the need for additional review. Sources of operational data include licensee event notifications submitted in accordance with 10 CFR 50.72, daily reports from NRC regional offices, and daily plant operating status reports obtained through the NRC's Headquarters Operations Center. The initial review includes consideration of the loss of margin associated with regulatory requirements and the potential risk significance of the event. Risk insights and staff engineering judgement are used to select issues that warrant follow-up effort. The Susquehanna shutdown was not selected for further review.

Question 4

Is the detailed cause of the problem known and is it related to power uprating of boiling water reactors (BWRs)?

ENCLOSURE

Response

As noted in our inspection report, the licensee determined the cause of the leak to be a crack in an instrumentation line weld caused by high-cycle fatigue due to vibration. No link has been identified between the instrumentation line leak and the Susquehanna power uprate.

Question 5

Have other U.S. BWRs experienced similar problems? If so, has NRC taken any action to oblige facilities to address the problem?

Response

A review of historical data, including licensee reports filed in accordance with 10 CFR 50.72 and 50.73 and NRC preliminary notifications of unusual events, identified a number of instances where plants experienced minor leaks attributed to mechanical or flow-induced vibration. These failures typically occurred in small piping and usually resulted in minor leaks of less than 1 gallon per minute. Several instances of vibration attributed to high recirculation flow or recirculation system harmonic resonances have occurred at U.S. BWR facilities. The affected licensees typically instituted administrative controls to limit recirculation flow, or to monitor vibration and reduce recirculation flow if excessive vibration is detected. The NRC issued Information Notice 95-16, "Vibration Caused by Increased Recirculation Flow in a Boiling Water Reactor," on March 9, 1995, to notify the industry of these occurrences. Information notices are a form of generic communication used by the NRC to inform the nuclear industry of significant operating experience. Information notices do not convey or imply new requirements and do not request information or actions.

No generic action has been taken to require licensees to address these occurrences because the existing regulatory structure affecting the design and operation of nuclear power plants effectively directs licensee actions. The NRC recognizes that complete reliance cannot be placed on any single element of the design, maintenance, or operation of a nuclear power plant to assure safe operation. Therefore, the defense-in-depth philosophy is applied in licensing nuclear power plants. In the defense-in-depth philosophy, protection is provided by several layers of defense involving accident prevention, accident mitigation, radiation protection, and emergency preparedness. Design features addressing each of these areas for each operating reactor have been reviewed and approved by the staff. Controls to support accident prevention include design controls to prevent piping degradation due to operational stresses, procedures to detect piping degradation prior to development of leaks, systems and procedures to enable prompt identification of minor leaks, and procedures to ensure that prompt, effective corrective action is implemented to correct and prevent recurrence of identified deficiencies.

Question 6

Have similar problems caused by increased material stress due to power uprating occurred previously in U.S. BWRs?

Response

None of the identified examples of vibration induced leaks noted were attributed to power uprating.

The NRC will continue to routinely evaluate operating reactor events for generic significance in accordance with our policy. These evaluations include consideration of the defense-in-depth philosophy discussed above.

Attachment: Inspection Report

January 24, 2000

Mr. Robert G. Byram
Senior Vice President, Nuclear
PP&L, Inc.
2 North Ninth Street
Allentown, PA 18101

SUBJECT: **NRC INTEGRATED INSPECTION REPORT 05000387/1999012 and 05000388/1999012**

Dear Mr. Byram:

On January 1, 2000, the NRC completed an inspection at the Susquehanna Steam Electric Station (SSES) Unit 1& 2 reactor facilities. The enclosed report covered routine activities by the resident inspectors and announced inspections of your Security and Safeguards, and Radiological Controls-External and Internal Exposure programs by Region I specialists. The inspectors discussed the findings of these inspections with Mr. R. Saunders, Vice President Nuclear Operations, Mr. B. Shriver, General Manager SSES, and other members of your staff, at an exit meeting at the completion of the inspections.

Overall, your staff safely operated the facility during this period. Plant Management's decisions to perform a controlled shutdown of Unit 2 to address the increase in primary containment unidentified water leakage and to correct additional known equipment problems prior to restart was a positive initiative.

In accordance with 10CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response will be placed in the NRC Public Document Room (PDR).

A reply to this letter is not required, but should you have any questions regarding this please contact me at 610-337-5322.

Sincerely,

ORIGINAL SIGNED BY

Curtis J. Cowgill, Chief
Projects Branch 4
Division of Reactor Projects

Docket Nos: 05000387, 05000388
License Nos: NPF-14, NPF-22

Enclosure: Inspection Report 05000387/1999012, 05000388/1999012

ATTACHMENT

cc w/encl:
R. F. Saunders, Vice President - Nuclear Site Operations
G. T. Jones, Vice President - Nuclear Engineering and Support
B. L. Shriver, General Manager - SSES
R. M. Peal, Manager, Nuclear Training
G. D. Miller, General Manager - Nuclear Assurance
R. R. Wehry, Nuclear Licensing - SSES
M. M. Golden, Manager - Nuclear Security
P. Nederostek, Nuclear Services Manager, General Electric
W. H. Lowthert, Manager, Nuclear Plant Services
A. M. Male, Manager, Quality Assurance
H. D. Woodeshick, Special Assistant to the President
G. DallaPalu, PP&L Nuclear Records
R. W. Osborne, Vice President, Supply & Engineering
Allegheny Electric Cooperative, Inc.
Commonwealth of Pennsylvania

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket Nos:	05000387, 05000388
License Nos:	NPF-14, NPF-22
Report No.	05000387/1999012, 05000388/1999012
Licensee:	PP&L, Inc. 2 North Ninth Street Allentown, PA 19101
Facility:	Susquehanna Steam Electric Station
Location:	P.O. Box 35 Berwick, PA 18603-0035
Dates:	November 20, 1999 through January 1, 2000
Inspectors:	S. Hansell, Senior Resident Inspector J. Richmond, Resident Inspector A. Blamey, Resident Inspector P. Frechette, Security Specialist J. McFadden, Radiation Specialist
Approved by:	Curtis J. Cowgill, Chief Projects Branch 4 Division of Reactor Projects

EXECUTIVE SUMMARY

Susquehanna Steam Electric Station (SSES), Units 1 & 2
NRC Inspection Report 05000387/1999012, 05000388/1999012

This inspection included aspects of PP&L's operations, maintenance, engineering and plant support at SSES. The report covers a five-week period of routine resident inspection activities and announced inspections by regional specialists.

Operations

- PP&L made conservative and effective decisions in response to increasing primary containment leakage on Unit 2. (Section O4.1)

- Two recent equipment failures related to the Unit 2 main transformer and Unit 1 reactor core isolation cooling temperature switch module were attributed to inadequate follow-up actions related to industry event information that had been previously reviewed by PP&L in the 1986 and 1990 time frames. (Section O8.1)

Maintenance

- After PP&L management established an Event Review Team, PP&L successfully resolved the numerous problems that occurred following the 2 year preventive maintenance on the "A" emergency diesel generator. (Section M1.2)

- During the planned replacement of two emergency service water (ESW) pumps, PP&L's maintenance department exhibited excellent work performance and good management oversight. (Section M1.3)

Engineering

- The Independent Safety Engineering Group report results were indicative of thorough investigation and analysis of plant issues and personnel performance. The reports were objective and contained meaningful feedback to plant management. (Section E7.1)

Plant Support

- PP&L implemented effective applied radiological controls. The radiation work permit program was adequately implemented. Personnel occupational exposure was maintained within applicable regulatory limits and as low as reasonably achievable. Access controls to radiologically controlled areas were effective, and appropriate occupational exposure monitoring devices were provided and used. (Section R1.1)

- PP&L implemented overall effective surveys, monitoring, and control of radioactive materials and contamination. Health Physics technicians properly documented survey results. In general, radiological housekeeping conditions were acceptable. (Section R1.2)

Executive Summary

- Security and safeguards activities with respect to alarm station controls, communications, and protected area access control of personnel, packages and vehicles were effectively implemented. (Section S1)

- Security and safeguards procedures and documentation were properly implemented. Event logs were properly maintained and effectively used to analyze, track, and resolve safeguards events. (Section S3)

- The security force members (SFMs) were provided effective training and adequately demonstrated that they had the requisite knowledge necessary to effectively implement their duties and responsibilities. (Sections S4 and S5)

- Management support was adequate to ensure effective implementation of the security program, as evidenced by adequate staffing levels and the allocations of resources to support programmatic needs. (Section S6)

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Report Details

Summary of Plant Status

Susquehanna Steam Electric Station (SSES) Unit 1 operated at 100% power throughout the inspection period with two exceptions. On December 4, power was reduced to 75% to change control rod positions and to perform control rod insertion time and main steam isolation valve testing, then returned to 100% power. On December 31, power was reduced to 80% as a year 2000 contingency, then returned to 100% on January 1, 2000.

SSES Unit 2 operated at 100% power throughout the inspection period with three exceptions. On December 11, power was reduced to 85% to change control rod positions and perform control rod insertion time testing, then returned to 100% power. On December 17, a normal shutdown was performed to repair a leaking instrument line for the "A" reactor recirculation pump. The Unit was restarted on December 23, and reached 100% power on December 25. On December 31, power was reduced to 80% as a year 2000 contingency, then returned to 100% on January 1, 2000.

I. Operations

O1 Conduct of Operations [1]

O1.1 Unit Operations and Operator Activities (71707)

The inspectors determined routine operator activities were satisfactorily established, communicated and conservatively performed in accordance with SSES procedures. Control room logs accurately reflected plant activities. During tours of the main control room, the inspectors observed good turn-over briefings and formal communications.

O2 Operational Status of Facilities and Equipment

O2.1 Operational Safety System Alignment (71707)

During routine plant tours, the proper alignment and operability of various safety systems, engineered safety features, and on-site power sources were verified. Partial walkdowns were performed for the emergency service water, "A" emergency diesel generator, control rod drive, and reactor recirculation systems. No equipment problems were noted.

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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.

O4 Operator Knowledge and Performance

O4.1 Unit 2 Reactor Shutdown and Plant Restart

a. Inspection Scope (71707,40500)

The inspectors reviewed PP&L's response to an increase in primary containment unidentified water leakage; the management evaluation and decision to perform a controlled reactor shutdown; and the assessment of the operator actions during the plant shutdown, equipment repairs, and subsequent reactor startup.

b. Observations and Findings

In response to an increasing primary containment unidentified water leakage, operators started reducing reactor power on Unit 2 on December 16, to allow for inspection inside the primary containment . Primary containment unidentified water leakage had increased to 0.87 gallons per minute (gpm.) The Technical Specification (TS) limit was 5 gpm.

The PP&L inspection discovered a small water leak on a 3/4 inch instrument pipe associated with the pressure indication for the "A" reactor recirculation pump seal. The leak was located at a welded 45 degree elbow connection. PP&L determined that the weld cracked due to high cycle fatigue caused by vibrational stresses. The line was replaced with a modified pipe that eliminated the 45 degree elbow weld. In addition, a pipe hanger was added to provide added support. PP&L inspected the "B" pump pipe and other similar reactor recirculation pipes and found no additional problems.

The "A" reactor recirculation pump pipe repairs were completed December 20, 1999. PP&L management decided to keep the unit shutdown to repair several other equipment reliability problems prior to plant restart. The decision to correct additional known equipment problems prior to restart was in line with PP&L's new policy concerning improvement in equipment reliability. Unit 2 was restarted safely on December 23, and reached full power on December 25.

c. Conclusions

PP&L made conservative and effective decisions in response to increasing primary containment leakage on Unit 2.

O8 Miscellaneous Operations Issues

O8.1 Licensee Event Report (LER) Review (71707,92700)

(Closed) LER 50-387/99-004-00
Reactor Core Isolation Cooling (RCIC) Manually Isolated due to Failure of Steam Leak Detector Temperature Switch

On August 8, 1999, operators manually isolated RCIC in response to a steam leak detection piping area high temperature alarm. The alarm was caused by a failure of a temperature switch module which had been installed 3 days earlier. The module was replaced and RCIC returned to service within 4 hours.

PP&L analysis found that a faulty power supply capacitor caused the module to fail. These modules were the subject of a 1986 General Electric Service Information Letter which recommended that the 7 year shelf life for the module should not be extended unless the capacitors were replaced with upgraded components. The failed module, although new, had been stored in the warehouse since 1984 and had not been upgraded. PP&L concluded that the vendor notice had been properly processed in accordance with the SSES Industry Event Review Program (IERP), but inadequate action had been taken for the IERP recommendations.

The inspectors noted that this was a second example where industry event information had been previously reviewed by PP&L without adequate follow-up action. NRC IR 50-387,388/99-06 discussed the June 1999 Unit 2 main transformer failure which resulted from a manufacturing defect identified in 1990. The inspectors determined that the PP&L documentation of this event was appropriate and met the requirements of 10 CFR 50.73. This event was reviewed in more detail in NRC IR 050000387/1999012 and 050000388/1999012. This LER is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Surveillance and Pre-Planned Maintenance Activity Review

a. Inspection Scope (61726,62707,40500)

The inspectors observed and reviewed selected portions of pre-planned maintenance and surveillance activities, to determine whether the activities were conducted in accordance with NRC requirements and SSES procedures.

b. Observations and Findings

The inspectors observed portions of the following work activities and surveillances:

Work Authorizations

PCWO 205801	Unit 2 Control Rod Drive Discharge Valve Inspection and Repair
PCWO 214659	“A” Emergency Diesel Generator Troubleshooting
PCWO 215235	Excess Flow Check Valve XV-142-F059G Rework
PCWO 218447	"2B" Recirc M-G Scope Tube Lockup Investigation
PCWO 105153	"C" ESW Pump Overhaul
PCWO 106084	"C" ESW Pump Motor Bearing Replacement
PCWO 202805	“D” Emergency Service Water Pump Rebuild

Surveillances

CH-SY-004	Functional Test of the Post Accident Sampling Station (PASS)
OP-264-001	Unit 2 Recirculation Pump Scoop Tube Unlocking
TP-024-145	“A” Emergency Diesel Generator Post Maintenance Test
SI-264-305	Recirc M-G Mechanical Stop Verification
SO-015-002	ESW Valve Stroke Testing
SE-024-B01	"B" EDG 24-hour Surveillance Run
SO-024-A01	"A" EDG Monthly Surveillance Run

In addition, selected portions of procedures and drawings associated with the maintenance and surveillance activities were also reviewed and determined to be acceptable. In general, maintenance personnel were knowledgeable of their assigned activities.

M1.2 "A" Emergency Diesel Generator Restoration following 2-Year Inspection

a. Inspection Scope (61726,62707,40500)

The inspectors observed and reviewed selected portions of the "A" Emergency Diesel Generator (EDG) restoration and surveillance activities. The activities and work documents were reviewed to determine whether the activities were conducted in accordance with NRC requirements and SSES procedures.

b. Observations and Findings

On October 4, 1999, the "A" EDG was removed from service to perform the 2 year preventative maintenance inspection. The "E" EDG was substituted for the "A" EDG. Restoration of the "A" EDG initially commenced on November 5, following completion of the planned maintenance.

During the post maintenance testing, numerous problems were encountered including an air start failure, gasket leakage (starting air header to cylinder), governor instability, and an unexpected diesel start when switching from local to remote control. After approximately 2 weeks of troubleshooting and rework failed to restore EDG operability, PP&L formed an Event Review Team (ERT) to review the "A" EDG issues and post maintenance testing methodology.

On December 3, PP&L determined that a new Agastat relay installed during the restoration troubleshooting had a manufacturing defect in the internal wiring. The internally mis-wired relay accounted for several of the problems observed during the initial restoration attempt. The ERT troubleshooting activities were thorough and the corrective action adequately resolved identified deficiencies.

The "A" EDG was successfully tested and returned to service on December 6. PP&L is evaluating the mis-wired Agastat relay in accordance with 10 CFR 50.21, "Reporting of Defects and Noncompliance."

c. Conclusions

After PP&L management established an Event Review Team, PP&L successfully resolved the numerous problems that occurred following the 2 year preventive maintenance on the “A” emergency diesel generator.

M1.3 "C" and "D" Emergency Service Water Pump Overhauls

a. Inspection Scope (61726,62707)

The inspectors observed and reviewed selected portions of the "C" and "D" Emergency Service Water (ESW) pump overhauls to determine whether the activities were conducted in accordance with NRC requirements and SSES procedures.

b. Observations and Findings

During December 13 to 16, an ESW system maintenance outage was performed to replace the "C" and "D" ESW pumps with rebuilt pumps and replace the "C" pump motor bearings. The "D" ESW pump was returned to service on December 14. The "C" ESW pump was returned to service on December 16.

The work activities were well planned, scheduled, and coordinated. The inspectors observed excellent work performance by the maintenance department under extreme weather conditions and good supervisory and management oversight.

The inspectors and a Regional risk assessment specialist reviewed PP&L's risk assessment for the planned ESW work activities. The inspectors found that PP&L's core damage risk assessment was thorough and considered all equipment and administrative controls related to station blackout and loss of off-site power scenarios. Nevertheless, the inspectors noted that by performing maintenance on two pumps in parallel, versus one pump at a time, the potential for a Technical Specification driven plant shutdown appeared to be greater. The increased potential of a forced shutdown was offset by the shorter period of pump out of service time associated with the parallel work schedule.

c. Conclusions

During the planned replacement of two emergency service water (ESW) pumps, PP&L's maintenance department exhibited excellent work performance and good management oversight.

III. Engineering

E7 Quality Assurance in Engineering Activities

E7.1 Oversight of Station Activities

a. Inspection Scope (37551)

The inspectors reviewed three Independent Safety Engineering Group (ISEG) assessment reports related to the following topics:

- ISEG report 7-99, Investigation of the Unit 1 Reactor Recirculation Runback Event of September 4, 1999.
- ISEG report 8-99, Investigation of the Response to Emergency Service Water (ESW) Flow Anomalies of September 20, 1999.
- ISEG report 9-99, Surveillance of Plant Operations, October 1999.

b. Observations and Findings

The selected ISEG reports contained extensive reviews of selected plant issues which provided recommended actions to improve performance in administrative and technical areas. The ISEG reports were indicative of thorough investigation and analysis. The 1999 evaluations were thorough and self critical of the evaluated areas. The reports contained candid feedback to station management and were documented in the corrective action program.

c. Conclusions

The Independent Safety Engineering Group report results were indicative of thorough investigation and analysis of plant issues and personnel performance. The reports were objective and contained meaningful feedback to plant management.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiological Controls-External and Internal Exposure

a. Inspection Scope (83750)

The inspector evaluated the effectiveness of selected aspects of the applied radiological control program. The evaluation included a selective review of the adequacy and implementation of the following radiological control program elements and activities:

- implementation of the radiation work permit (RWP) program
- RWP No. 1999-0095 and 1999-0109 related to the reactor water clean-up (RWCU) system
- access controls to radiologically controlled areas (RCAs)

- use and adequacy of personnel occupational exposure monitoring devices
- maintenance of personnel occupational radiation exposures (external and internal) within applicable regulatory limits and as low as reasonably achievable (ALARA)
- status of the National Voluntary Laboratory Accreditation Program (NVLAP)
- periodic thermoluminescent dosimeters (TLD) quality control (QC) testing
- operation and maintenance of a whole-body-counting (WBC) program
- dose calculations for skin dose and for internal uptakes

The inspector evaluated performance in the above-selected areas via observation of work activities, tours of the radiologically controlled area (RCA), discussions with plant personnel, review of documentation, and evaluation of applicable station procedures.

b. Observations and Findings

PP&L maintained personnel occupational radiation exposures (external and internal) within regulatory limits and as low as reasonably achievable (ALARA).

PP&L implemented effective access controls to the radiologically controlled areas of the station including use of RWPs, bar code readers, and computerized log-in stations. No access control deficiencies were identified. Appropriate personnel monitoring devices for access to the RCA were supplied and properly used.

c. Conclusions

PP&L implemented effective applied radiological controls. The radiation work permit program was adequately implemented. Personnel occupational exposure was maintained within applicable regulatory limits and as low as reasonably achievable. Access controls to radiologically controlled areas were effective, and appropriate occupational exposure monitoring devices were provided and used.

R1.2 Radiological Controls-Radioactive Materials, Contamination, Surveys, and Monitoring

a. Inspection Scope (83750)

The inspector evaluated the effectiveness of PP&L's surveys, monitoring, and control of radioactive materials and contamination. The evaluation included a selective review of the adequacy and effectiveness of the following radioactive material and contamination control program elements:

- surveys and monitoring of radioactive material and contamination
- the calibration status of survey and monitoring equipment
- the proper use of personal contamination monitors and friskers
- the tracking of personnel contamination events and goals

The inspector evaluated performance in the above selected areas via observation of work activities, tours of the RCA, discussions with personnel, review of documentation, and evaluation of applicable station procedures.

b. Observations and Findings

In general, radiological housekeeping conditions in the reactor and turbine buildings were acceptable. The inspector noted several examples of poor housekeeping practices in locked areas of the reactor and turbine buildings. Generally, radioactive material and radioactive waste were clearly labeled, segregated, and stored in an orderly manner.

PP&L implemented an effective radioactive material and contamination control program. Continuous air monitors were used in the RCA. A review of instrument calibration records indicated that the calibration program was implemented in accordance with procedures and only one minor discrepancy was noted.

Goals to assist in monitoring and tracking personnel and area contamination rates and percent recoverable contaminated area continued to be maintained and used to gauge the overall effectiveness of the station's programs in this area.

c. Conclusions

PP&L implemented effective surveys, monitoring, and control of radioactive materials and contamination. Health Physics technicians properly documented survey results. In general, radiological housekeeping conditions were acceptable.

R1.3 Radiological Controls-As Low As Reasonably Achievable (ALARA)

a. Inspection Scope (83750)

The inspector evaluated the effectiveness of PP&L's program to maintain occupational radiation exposure as low as is reasonably achievable. The evaluation included a selective review of the adequacy and effectiveness of the following ALARA program elements/documents:

- April 1999 HP Performance Indicator Report
- 1998 ALARA Assessment
- Draft Year 2000 Person-Rem Goal Breakdown
- HP Unit 2 (U2) Ninth Refueling and Inspection Outage (9RIO) Report
- Site ALARA Committee (SAC) Agenda for November 8, 1999

The inspector evaluated performance in the above selected areas via observation of work activities, tours of the RCA, discussions with personnel, review of documentation and station procedures.

b. Observations and Findings

The ALARA program continued to be well staffed and was being implemented in accordance with procedural controls. Post-job reviews were being used to generate exposure reduction plan (ERP) items for improving the ALARA effort. Annual and outage person-rem goals for the site were established, and person-rem goals for each work group were developed. On a regular periodic basis, actual person-rem accumulated for the site and for each work group was compared to the projections based on the established goals.

Lessons-learned from 1999 were being used in the development of the annual and outage goals for the year 2000. To this end, the Site ALARA Committee (SAC) established actions to improve dose control for the remainder of 1999 and was involved in the development of longer range exposure reduction activities including improved high radiation area controls and evaluation of remote monitoring methods. Additionally, the SAC initiated corrective actions to address long-standing employee concerns and exposure reduction plan items.

c. Conclusions

The ALARA program remains acceptable.

R7 Quality Assurance in RP&C Activities

a. Inspection Scope (83750)

The inspector evaluated the effectiveness of PP&L's self-identification and corrective action processes in the RP&C area. The evaluation included a selective review of the various surveillance, audit, and condition reports. The inspector also discussed the process with several cognizant personnel.

b. Observations and Findings

The Health Physics Program SRC/NAS Audit No. 99-007 was broad in scope and detailed. The seven Quality Surveillance Reports reviewed were detailed. Four assessments were reviewed which covered radiation protection management, external dose assessment, the vendor-provided TLD irradiation service , and a vendor-provided instrumentation service. The breadth varied, but each was detailed and resulted in recommendations for improvement.

Approximately 160 Radiological Protection condition reports were issued in the period from December 31, 1998 to November 22, 1999. A number of condition reports related to HP were reviewed and found to include low threshold items. The inspector found that for those HP condition reports reviewed, the issues were elevated to an adequate management level, evaluated, and adequately corrected. Additional inspection of PP&L’s corrective action program is discussed in Inspection Reports 05000387/1999013 and 05000388/1999013.

c. Conclusions

PP&L's self-identification process in the area of radiation protection was generally effective.

S1 Conduct of Security and Safeguards Activities

a. Inspection Scope (81700)

Determine whether the conduct of security and safeguards activities met PP&L's commitments in the NRC-approved security plan (the Plan) and NRC regulatory requirements. The security program was inspected during the period of November 29 - December 3, 1999. Areas inspected included: alarm stations; communications; protected area (PA) access control of personnel, packages and vehicles.

b. Observations and Findings

Alarm Stations The inspector verified that the alarm stations were equipped with appropriate alarms, surveillance and communications capabilities. The inspector determined in interviews with the alarm station operators, that they were knowledgeable of their duties and responsibilities. The inspector also verified, through observations and interviews, that the alarm stations were continuously manned, independent, and diverse. The alarm stations did not contain any operational activities that could interfere with the execution of the detection, assessment, and response functions.

Communications The inspector determined by document reviews and discussions with alarm station operators, that the alarm stations were capable of maintaining continuous intercommunications and communications with each security force member (SFM) on duty and were exercising communication methods with the local law enforcement agencies as committed to in the Plan.

PA Access Control of Personnel, Vehicles, and Hand-Carried Packages and Material On November 30, and December 1, 1999, the inspector observed personnel and package search activities at the personnel access portal. The inspector determined that positive controls were in place to ensure only authorized individuals were granted access to the PA, that all personnel and hand-carried items entering the PA were properly searched and that vehicles entering the PA were properly controlled, and searched.

c. Conclusions

Security and safeguards activities with respect to alarm station controls, communications, and protected area access control of personnel, packages and vehicles were effectively implemented and met PP&L commitments and NRC requirements.

S2 Status of Security Facilities and Equipment

a. Inspection Scope (81700)

Areas inspected were: PA assessment aids, PA detection aids, personnel search equipment and testing, maintenance and compensatory measures.

b. Observations and Findings

PA Assessment Aids On December 2, 1999, the inspector assessed the effectiveness of the assessment aids by observing, on closed circuit television, two SFMs conducting a walkdown of the perimeter of the PA. The assessment aids had generally good picture quality and zone overlap. Additionally, to ensure Plan commitments are satisfied, PP&L had procedures in place requiring the implementation of compensatory measures in the event the alarm station operators are unable to properly assess the cause of an alarm.

Personnel and Package Search Equipment On December 1, 1999, the inspector observed both routine use and performance testing of PP&L personnel and package search equipment. The inspector determined that the search equipment performed in accordance with PP&L procedures and Plan commitments.

PA Detection Aids The inspector observed an SFM conducting performance testing of the perimeter intrusion detection system (PIDS). The testing consisted of intrusion attempts in numerous randomly selected zones during the camera walkdown. The appropriate alarms were generated in each attempt. The equipment was functional and effective and met the requirements of the Plan.

c. Conclusions

PP&L's security facilities and equipment were determined to meet their commitments and NRC requirements.

S3 Security and Safeguards Procedures and Documentation

a. Inspection Scope (81700)

Areas inspected were: implementing procedures and security event logs.

b. Observations and Findings

Security Program Procedures The inspector determined that the procedures were consistent with the Plan commitments, and were properly implemented and accomplished based on review of selected implementing procedures associated with PA access control of personnel, packages and materials, testing and maintenance of personnel search equipment, and performance testing of PA detection aids.

Security Event Logs The inspector reviewed the Security Event Logs for the previous twelve months. Based on this review, and discussion with security management, the inspector determined that PP&L appropriately analyzed, tracked, resolved and documented safeguards events that PP&L determined did not require a report to the NRC within 1 hour.

c. Conclusions

Security and safeguards procedures and documentation were properly implemented. Event Logs were properly maintained and effectively used to analyze, track, and resolve safeguards events.

S4 Security and Safeguards Staff Knowledge and Performance

a. Inspection Scope (81700)

Area inspected was: security staff requisite knowledge.

b. Observations and Findings

Security Force Requisite Knowledge The inspector observed a number of SFMs in the performance of their routine duties. These observations included alarm station operations, personnel, vehicle and package searches, and performance testing of the PIDS. Additionally, interviews of SFMs were conducted. Based on the responses, the inspector determined that the SFMs were knowledgeable of their responsibilities and duties and could effectively carry out their assignments.

c. Conclusions

The SFMs adequately demonstrated that they had the requisite knowledge necessary to effectively implement the duties and responsibilities associated with their position.

S5 Security and Safeguards Staff Training and Qualification

a. Inspection Scope (81700)

Areas inspected were security training and qualifications, and training records.

b. Observations and Findings

Security Training and Qualifications On December 3, 1999, the inspectors observed 7 randomly selected training and qualification (T&Q) records of SFMs. Physical and requalification records were inspected for armed and supervisory personnel. The results of the review indicated that the security force was being trained in accordance with the approved T&Q plan.

Training Records The inspector determined that the records were properly maintained, accurate, and reflected the current qualifications of the SFMs.

c. Conclusions

Security force personnel were being trained in accordance with the requirements of the T&Q Plan. Training documentation was properly maintained and accurate and the training provided by the training staff was effective.

S6 Security Organization and Administration

a. Inspection Scope (81700)

Areas inspected were: management support, effectiveness and staffing levels.

b. Observations and Findings

Management Support The inspector determined based on review of program implementation since the last program inspection, that adequate support and resources continued to be available to ensure program implementation.

Staffing Levels The total number of trained SFMs immediately available on shift met the minimum requirements specified in the Plan and implementing procedures. No performance issues were noted in the areas inspected.

c. Conclusions

Management support was adequate to ensure effective implementation of the security program, as evidenced by adequate staffing levels and the allocations of resources to support programmatic needs.

S7 Quality Assurance (QA) in Security and Safeguards Activities

a. Inspection Scope (81700)

Areas inspected were: audits, problem analyses, corrective actions and effectiveness of management controls.

b. Observations and Findings

Audits The inspector reviewed the annual physical security audit. The audit was thorough and in-depth. The audit identified 4 deficiencies. The deficiencies were related to administrative controls, and were minor documentation errors. None of the audit findings were indicative of programmatic issues.

Problem Analyses The inspector reviewed data derived from the security department's self-assessment program. Potential weaknesses were being properly identified, tracked, and trended.

Corrective Actions The inspector reviewed the corrective actions implemented by PP&L in response to the 1999 QA audit and self-assessment program. The corrective actions were technically sound and were performed in a timely manner.

Effectiveness of Management Controls PP&L had programs in place for identifying, analyzing and resolving problems. They included the performance of annual QA audits, a departmental self-assessment program and the use of industry data such as violations

of regulatory requirements identified by the NRC at other facilities, as a criterion for self-assessment.

c. Conclusions

PP&L's audit program was being properly administered. In addition, the self-assessment program was being effectively implemented to identify and resolve potential weakness.

S8 Miscellaneous Security and Safeguards Issues

S8.1 (Closed) LER 50-387/99-005-00, Safeguards Event (71750, 92700)

On August 6, 1999, PP&L identified that an observation which inadvertently contained safeguards information had been distributed via an uncontrolled electronic mail (e-mail) system.

A review was conducted of PP&L's corrective actions associated with this event, addressing the dissemination of safeguards via company e-mail. It was determined that PP&L implemented appropriate compensatory measures, and corrective actions to preclude recurrence were acceptable. No violation of NRC requirements was identified. This LER is closed.

V. Management Meetings

X1 Exit Meeting Summary

A Region I security specialist presented the results of the Security and Safeguards program inspection to members of PP&L management at the conclusion of the inspection on December 3, 1999. PP&L acknowledged the findings presented.

A Region I health physics specialist presented the results of the Radiological Controls-External and Internal Exposure programs inspection to members of PP&L management at the conclusion of the inspection on December 10, 1999. PP&L acknowledged the findings presented.

The inspectors presented the inspection results to members of PP&L management at the conclusion of the inspection period, on January 7, 2000. PP&L acknowledged the findings presented.

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

INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering Observations
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726	Surveillance Observations
IP 62700	Maintenance Program Implementation
IP 62707	Maintenance Observations
IP 71707	Plant Operations
IP 71750	Plant Support Activities
IP 81700	Physical Security Program for Power Reactors
IP 83750	Occupational Radiation Exposure
IP 92700	On Site Followup of Reports

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened/Closed

None

Updated

None.

Closed

50-387/99-004-00	LER	Reactor Core Isolation Cooling (RCIC) Manually Isolated due to Failure of Steam Leak Detector Temperature Switch (Section O8.1)
50-387/99-005-00	LER	Safeguards Event (Section S8.1)

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CR	Condition Report
CS	Core Spray
DCP	Design Change Package
EAL	Emergency Plan Action Level
EDG	Emergency Diesel Generator
° F	Fahrenheit
FSAR	Final Safety Analysis Report
IR	[NRC] Inspection Report
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLRT	Local Leak Rate Test
LPCI	Low Pressure Coolant Injection
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NOV	[NRC] Notice of Violation
NRC	Nuclear Regulatory Commission
NUMARC	Nuclear Management and Resources Council
OD	Operability Determination
OSHA	Occupational Safety and Health Administration
PCO	Plant Control Operator
PCPR	Plant Component Problem Report
PP&L	Pennsylvania Power and Light Company
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RPS	Reactor Protection System
RP&C	Radiological Protection and Chemistry
scfh	Standard Cubic Feet per Hour
SSCs	Structures, Systems, and Components
SSES	Susquehanna Steam Electric Station
TS	Technical Specification