

December 2, 2008

Mr. William H. Spence  
Executive Vice-President  
Chief Operating Officer/Chief Nuclear Officer  
PPL Corporation  
Two North Ninth St., GENTW16  
Allentown, PA 18101-1179

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC TRIENNIAL FIRE  
PROTECTION INSPECTION REPORT 05000387/2008009 AND  
05000388/2008009

Dear Mr. Spence:

On November 7, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Susquehanna Steam Electric Station. The enclosed report documents the inspection results, which were discussed at an exit meeting on November 7, 2008, with Mr. C. Gannon and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding of very low safety significance (Green) that was a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

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NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/ADAMS.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

John F. Rogge, Chief  
Engineering Branch 3  
Division of Reactor Safety

Docket Nos. 50-387; 50-388  
License Nos. NPF-14, NPF-22

Enclosures: Inspection Report 05000387/2008009 and 05000388/2008009  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos. 05000387, 05000388

License Nos. NPF-14, NPF-22

Report Nos. 05000387/2008009 and 05000388/2008009

Licensee: PPL Susquehanna, LLC

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, Pennsylvania

Dates: October 20-24, 2008 and November 3-7, 2008

Inspectors: J. Lilliendahl, Reactor Inspector, DRS  
L. Scholl, Senior Reactor Inspector, DRS  
J. Tifft, Reactor Inspector, DRS

Approved by: John F. Rogge, Chief  
Engineering Branch 3  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000387/2008009, 05000388/2008009; 10/20/2008 – 11/7/2008, Susquehanna Steam Electric Station, Units 1 and 2; Triennial Fire Protection Team Inspection, Fire Protection.

The report covered a two-week triennial fire protection team inspection by specialist inspectors. One Green non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified Findings

#### Cornerstone: Mitigating Systems

- Green. The team identified a Green non-cited violation of Units 1 and 2 Technical Specification 5.4.1, "Procedures" for PPL's failure to establish appropriate procedure directions for operation of the plant from the remote shutdown panel following a control room evacuation due to a fire. PPL's guidance for control room evacuation is provided in Unit 1 (Unit 2) procedure ON-100(200)-009, Control Room Evacuation, Revision 15. However, the team found that these procedures did not contain directions for establishing alternate shutdown cooling from the Remote Shutdown Panel using the train of equipment that had been analyzed to remain free from fire damage in the event of a control room fire. The licensee initiated a condition report and implemented procedure changes to add a section for operation of Residual Heat Removal(RHR)/Low Pressure Coolant Injection(LPCI) in the alternate shutdown cooling mode from the remote shutdown panel.

This finding is more than minor because it is associated with the procedural quality attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent core damage. Specifically, this issue would have required the plant operators to implement emergency operating procedures for maintaining reactor coolant inventory and cooling without the benefit of appropriate procedure guidance. This finding is related to the cross-cutting area of Problem Identification and Resolution (Corrective Action Program) because PPL did not take appropriate corrective actions to address a safety issue in a timely manner, commensurate with its safety significance and complexity. (P.1(d)), (Section 1R05.01)

### B. Licensee-Identified Violations

None

## REPORT DETAILS

### Background

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection." The objective of the inspection was to assess whether PPL has implemented an adequate fire protection program and that post-fire safe shutdown capabilities have been established and are being properly maintained at the Susquehanna Steam Electric Station. The following fire areas (FAs) were selected for detailed review based on risk insights from the Susquehanna Individual Plant Examination (IPE)/Individual Plant Examination of External Events (IPEEE):

- Control Room (CS-9)
- Unit 1, Upper Relay Room (CS-33)
- Unit 1, Division II, Equipment Room (CS-17)
- Unit 1, 4kV Switchgear Division II, Train 'D' (R-1E)

Inspection of these areas/zones fulfills the inspection procedure requirement to inspect a minimum of three samples.

The inspection team evaluated the licensee's fire protection program (FPP) against applicable requirements which include plant Technical Specifications, Operating License Condition 2.C.(6), NRC Safety Evaluations, 10 CFR 50.48 and 10 CFR 50 Appendix R. The team also reviewed related documents that include the Fire Protection Review Report (FPRR) and the Post-Fire Safe Shutdown Analysis.

Specific documents reviewed by the team are listed in the attachment.

### **1. REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (IP 71111.05T – 4 Samples)

.01 Post-Fire Safe Shutdown From Outside Main Control Room (Alternative Shutdown) and Normal Shutdown

a. Inspection Scope

#### Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentations drawings (P&IDs), electrical drawings, the UFSAR and other supporting documents to verify that hot and cold shutdown could be achieved and maintained for fires that rely on shutdown from outside the control room. This review included verification that shutdown from outside the control room could be performed both with and without the availability of offsite power. Plant walkdowns were also

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performed to verify that the plant configuration was consistent with that described in the safe shutdown analysis and fire hazards analysis (FHA). These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support systems functions. The team verified that the systems and components credited for use during this shutdown method would remain free from fire damage. The team verified that the transfer of control from the control room to the alternative shutdown location(s) would not be affected by fire-induced circuit faults (e.g., by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Similarly, for fire areas that utilize shutdown from the control room, the team also verified that the shutdown methodology properly identified the components and systems necessary to achieve and maintain safe shutdown conditions.

### Operational Implementation

The team verified that the training program for licensed and non-licensed operators included alternative shutdown capability. The team also verified that personnel required for safe shutdown using the normal or alternative shutdown systems and procedures are trained and available onsite at all times, exclusive of those assigned as fire brigade members.

The team reviewed the adequacy of procedures utilized for post-fire shutdown and performed an independent walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also verified that the operators could be reasonably expected to perform specific actions within the time required to maintain plant parameters within specified limits. Time critical actions, which were verified, included restoration of alternating current (AC) electrical power, establishing the remote shutdown and local shutdown panels, establishing reactor coolant makeup, and establishing decay heat removal.

Specific procedures reviewed for alternative shutdown, including shutdown from outside the control room included the following:

- ON-100-009 Control Room Evacuation, Rev. 15
- ON-200-009 Control Room Evacuation, Rev. 15
- ON-013-001 Response to Fire, Rev. 25

The team reviewed manual actions to ensure that they had been properly reviewed and approved and that the actions could be implemented in accordance with plant procedures in the time necessary to support the safe shutdown method for each fire area. The team also reviewed the periodic testing of the alternative shutdown transfer capability and instrumentation and control functions to ensure the tests are adequate to ensure the functionality of the alternative shutdown capability.

b. Findings

Introduction: The team identified a non-cited violation of Units 1 and 2 Technical Specification 5.4.1, "Procedures" for PPL's failure to establish appropriate procedure directions for operation of the plant from the remote shutdown panel following a control room evacuation due to a fire. This finding was determined to be of very low safety significance (Green) because it affected the ability to reach and maintain cold shutdown conditions.

Description: PPL's guidance for control room evacuation is provided in Unit 1 (Unit 2) procedures ON-100(200)-009, Control Room Evacuation, Revision 15. These procedures provide direction for controlling the plant from the remote shutdown panels (RSPs). The components that can be operated at the RSPs have been analyzed to ensure they would remain functional following a fire in the main control room. Components in systems or trains not available for operation from the RSPs may not remain free from fire damage.

Step 4.5.5 of procedure ON-100(200)-009 directed operators to utilize Residual Heat Removal/Low Pressure Coolant Injection (RHR/LPCI) in the alternate shutdown cooling mode in the event fire induced hot shorts result in damage to motor operated valves (MOVs) required for the operation of the reactor core isolation cooling (RCIC), RHR Suppression Pool Cooling or RHR Shutdown Cooling systems from the RSPs. However, the team found that the RHR system operating procedure (OP) sections referenced for implementation of alternate shutdown cooling incorrectly utilized the trains of RHR that had not been analyzed to be free from fire damage. Plant procedures did not contain guidance for establishment of alternate shutdown cooling from the RSP using the protected equipment. On October 23, 2008, condition report (CR) 1085354 was initiated, in part, to document the need to provide procedural direction for the operation of RHR from each unit's respective RSP. During the inspection the licensee implemented operating procedure changes to add a section for operation of RHR/LPCI in the alternate shutdown cooling mode.

The licensee subsequently informed the team that on February 9, 2006, CR 750632 had been initiated to document a deficiency with the RHR system operating procedures in that the procedures did not contain a section to perform a manual Low Pressure Coolant Injection (LPCI) from the remote shutdown panel. However, no corrective actions had been taken to address that issue.

Failing to establish a procedure for alternate shutdown cooling from the remote shutdown panel as required by Technical Specification 5.4.1.d is a performance deficiency which was reasonably within PPL's ability to foresee and correct.

Analysis: This finding is more than minor because it is associated with the procedural quality attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent core damage. Specifically, this issue would have required the plant operators to implement emergency operating procedures (EOP) for maintaining reactor coolant inventory and cooling without the benefit of appropriate

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procedure guidance. In accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process (SDP)," the team concluded that this finding was of very low safety significance (Green). The team's conclusion was based on the determination that the procedure for utilizing alternate shutdown cooling as required by the design analysis for specific credible fire scenarios affected the ability to reach and maintain cold shutdown conditions and therefore the issue was of low safety significance and screened to Green as directed in step 1.3 of Attachment 1 to Appendix F of the SDP, "Fire Protection SDP Phase 1 Worksheet."

This finding is related to the cross-cutting area of Problem Identification and Resolution – Corrective Action Program because PPL did not take appropriate corrective actions to address a safety issue in a timely manner, commensurate with its safety significance and complexity. Specifically, PPL had previously identified this issue involving the lack of procedures over two years prior to this inspection; however, corrective actions were not implemented. [P.1(d)]

**Enforcement:** Units 1 and 2 Technical Specification 5.4.1.d requires that written procedures shall be established, implemented, and maintained covering fire protection program implementation. Contrary to this requirement, PPL failed to establish adequate procedures for the manual operation of the RHR system from the RSP. Specifically, PPL did not ensure that procedure ON-100(200)-009 provided adequate directions for controlling the plant following the evacuation of the control room following a fire. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program (CR 1085354), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000387, 05000388/2008009-01, Failure to establish adequate procedures for operation of the plant following evacuation of the control room due to a fire)**

## .02 Protection of Safe Shutdown Capabilities

### a. Inspection Scope

The team reviewed the FHA, safe shutdown analyses and supporting drawings and documentation to verify that safe shutdown capabilities were properly protected. The team ensured that separation requirements of Section III.G of 10 CFR 50, Appendix R and the UFSAR were maintained for the credited safe shutdown equipment and their supporting power, control and instrumentation cables. This review included an assessment of the adequacy of the selected systems for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and associated support system functions.

The team reviewed the licensee's procedures and programs for the control of ignition sources and transient combustibles to assess their effectiveness in preventing fires and in controlling combustible loading within limits established in the FHA. A sample of hot work and transient combustible control permits were also reviewed. The team performed plant walkdowns to verify that protective features were being properly maintained and administrative controls were being implemented.

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b. Findings

No findings of significance were identified.

.03 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries (including walls, fire doors and fire dampers), and electrical raceway fire barriers to ensure they were appropriate for the fire hazards in the area.

The team reviewed installation/repair and qualification records for a sample of penetration seals to ensure the fill material was of the appropriate fire rating and that the installation met the engineering design. The team also reviewed similar records for the fire protection wraps to ensure the material was of an appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings of significance were identified.

.04 Active Fire Protection

a. Inspection Scope

The team reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected plant fire areas. This included verification that the manual and automatic detection and suppression systems were installed, tested, and maintained in accordance with the National Fire Protection Association (NFPA) code of record, or NRC approved deviations, and that each suppression system would control and/or extinguish fires associated with the hazards in the selected areas. A review of the design capability of the suppression agent delivery systems were verified to meet the code requirements for the hazards involved. The team also performed a walkdown of accessible portions of the detection and suppression systems in the selected areas as well as a walkdown of major system support equipment in other areas (e.g. fire pumps, storage tanks and supply system) to assess the material condition of the systems and components.

The team reviewed electric and diesel fire pump flow and pressure tests to ensure that the pumps were meeting their design requirements. The team also reviewed the fire main loop flow tests to ensure that the flow distribution circuits were able to meet the design requirements.

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The team also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire

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brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the team inspected the fire brigade equipment (including smoke removal equipment) to determine operational readiness for fire fighting.

b. Findings

No findings of significance were identified.

.05 Protection From Damage from Fire Suppression Activities

a. Inspection Scope

The team performed document reviews and plant walkdowns to verify that redundant trains of systems required for hot shutdown are not subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team verified that:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat or hot gases, cause activation of suppression systems that could potentially damage all redundant safe shutdown trains.
- A fire in one of the selected fire areas (or the inadvertent actuation or rupture of a fire suppression system) would not directly cause damage to all redundant trains (e.g. sprinkler caused flooding of other than the locally affected train).
- Adequate drainage is provided in areas protected by water suppression systems.

b. Findings

No findings of significance were identified.

.06 Alternative Shutdown Capability

Alternative shutdown capability for the areas selected for inspection utilizes shutdown from outside the control room and is discussed in section 1R05.01 of this report.

.07 Circuit Analysis

a. Inspection Scope

The team verified that the licensee performed a post-fire safe shutdown analysis for the selected fire areas and the analysis appropriately identified the structures, systems, and components important to achieving and maintaining safe shutdown. Additionally, the team verified that the licensee's analysis ensured that necessary electrical circuits were properly protected and that circuits that could adversely impact safe shutdown due to

Enclosure

hot shorts, shorts to ground, or other failures were identified, evaluated, and dispositioned to ensure spurious actuations would not prevent safe shutdown. The team's review considered fire and cable attributes, potential undesirable consequences and common power supply/bus concerns. Specific items included the credibility of the fire threat, cable insulation attributes, cable failure modes, and actuations resulting in flow diversion or loss of coolant events.

The team also reviewed cable routing for a sample of components required for post-fire safe shutdown to verify that cable routing was consistent with the assumptions and conclusions of the safe shutdown analyses.

Cable failure modes were reviewed for the following components:

- LI-14262, Remote Shutdown Panel Reactor Vessel Level Indication
- Automatic Depressurization System Valves
- HPCI Division I High Reactor Vessel Level Trip
- SRVs A, B, and C, Remote Shutdown Protected Safety Relief Valves

The team reviewed circuit breaker coordination studies to ensure equipment needed to conduct post-fire safe shutdown activities would not be impacted due to a lack of coordination. Additionally, the team reviewed a sample of circuit breaker maintenance records to verify that circuit breakers for components required for post-fire safe shutdown were properly maintained in accordance with procedural requirements.

b. Findings

No findings of significance were identified.

.08 Communications

a. Inspection Scope

The team reviewed safe shutdown procedures, the safe shutdown analysis, and associated documents to verify an adequate method of communications would be available to plant operators following a fire. During this review, the team considered the effects of ambient noise levels, clarity of reception, reliability, and coverage patterns. The team also inspected the designated emergency storage lockers to verify the availability of portable radios for the fire brigade and for plant operators. The team verified that communications equipment such as sound powered phone system cables would not be affected by a fire.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team observed the placement and coverage area of eight-hour emergency lights throughout the selected fire areas to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire safe shutdown. The team also verified that the battery power supplies were rated for at least an eight-hour capacity. Preventive maintenance procedures, the vendor manual, completed surveillance tests, and battery replacement practices were also reviewed to verify that the emergency lighting was being maintained in a manner that would ensure reliable operation.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team verified that the licensee had evaluated the need for any dedicated repair procedures, equipment, and materials to accomplish repairs of components required for cold shutdown which might be damaged by the fire to ensure cold shutdown could be achieved within the time frames specific in their design and licensing bases. The team confirmed that the safe shutdown analysis for Susquehanna did not identify any systems or components that would require repairs to achieve cold shutdown.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team verified that compensatory measures were in place for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g. detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing safe shutdown functions or capabilities). The team also verified that the short term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that the licensee was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems

.01 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team verified that PPL was identifying fire protection and post-fire safe shutdown issues at an appropriate threshold and entering them into the corrective action program. The team also reviewed a sample of selected issues to verify that PPL had taken or planned appropriate corrective actions.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On November 7, 2008, the team presented the inspection results to Mr. C. Gannon and other members of the site staff, who acknowledged the findings. No proprietary information was included in this inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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**ATTACHMENT**  
**SUPPLEMENTAL INFORMATION**  
**KEY POINTS OF CONTACT**

Licensee Personnel

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D. Brophy, Licensing  
L. Casella, System Engineering  
S. Davis, System Engineering  
C. Gannon, Vice President – Operations  
T. Gorman, Fire Protection Project Manager  
R. Harmon Foreman, Effluents  
E. Heller, Operations  
M. Jacopetti, Training  
F. Negvesky, System Engineering

NRC Personnel

C. Cahill, Senior Reactor Analyst, Division of Reactor Safety  
F. Jaxheimer, Senior Resident Inspector, Susquehanna Steam Electric Station  
G. Newman, Acting Resident Inspector, Susquehanna Steam Electric Station  
J. Rogge, Chief, Engineering Branch 3, Division of Reactor Safety

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened

None

Opened and Closed

05000387, 388/2008009-01	NCV	Failure to establish adequate procedures for operation of the plant following evacuation of the control room due to a fire.
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Closed

None

Discussed

None

## **LIST OF DOCUMENTS REVIEWED**

### Calculations/Engineering Evaluation Reports

EC-004-0501, Appendix R Associated Circuit Analysis, Rev. 46  
EC-013-0509, Minimum Reactor Water Level under Spurious Operation during a Fire, Rev. 2  
EC-013-0561, Appendix R – HVAC Study, Rev. 6  
EC-013-0562, Effects of Fire Protection System Actuation, Rev. 0  
EC-013-0632, PGCC Floor Module Analysis of Design Intent, Location, and Seal Deterioration for Lateral Duct Covers, Rev. 0  
EC-013-0788, Inadvertent Reactor Vessel Injection Resulting from Spurious Operation of the HPCI or RCIC Systems, Rev. 9  
EC-013-0843, SSES 10CFR50 Appendix R Compliance Manual, Rev. 29 and 31  
EC-013-0859, Appendix R Analysis for a Control Room Fire, Rev. 15  
EC-013-0920, Smoke Generation Rate Based on Fire Size, Attachment 11, Rev. 3  
EC-013-0968, Determination of CO2 Mass Addition Requirements for the Control Structure Cable Chase, Relay, UPS, and Computer Rooms Based on Model Predictions, Rev. 4  
EC-013-1048, Impact of Inadvertent RPV Overfill on SRV Discharge Piping, Rev. 2  
EC-013-1438, Examination of Appendix R Safe Shutdown Components with Regard to Fire Suppression Activities, Rev. 2  
EC-013-1456, Technical Criteria for Addressing Damage Due to Fire Suppression Discharge (Both Appendix R and Non-Appendix R), Rev. 0  
EC-013-1873, Operator Manual Action Feasibility Analysis, Rev. 2  
EC-FORC-1001, Evaluation of SRV Transients Due to Appendix R Fire, Rev. 1  
EC-PUPC-20611, EPU Task Report 0611, Appendix R, Rev. 0  
EC-THYD-1035, In-Shroud Level Response for a Boildown Transient, Rev. 2  
EC-THYD-1064, MAAP Analysis of Appendix R Scenarios, Rev. 2  
EE-35, Engineering Analysis for Penetration X-12-7-D4, Rev. 7/29/05  
MC-C-MDM-016, Dynamic Qualification of Fire Dampers, Rev. 0

### Procedures

DC-OP-001, Post Fire Recovery Actions, Rev. 9  
EO-000-102, RPV Control, Rev. 6  
EO-000-114, RPV Flooding, Rev. 4  
MT-007-002, E8 and E30 (Appendix R and Non-Appendix R) Emergency Lighting Preventative Maintenance and Functional Failure Checks, Rev. 13  
MT-AD-504, Scaffold Erection, Review, and Inspection, Rev. 11  
MT-GE-008, 480 Volt and Under Circuit Breaker High Current Testing, Rev. 21  
MT-RC-004, CO/IAC Relay Calibration Procedure, Rev. 9  
NDAP-QA-0302, System Status and Equipment Control, Rev. 17  
NDAP-QA-0442, Control of Ignition Sources: Cutting, Welding, and Hot Work Permits, Rev. 5  
NDAP-QA-0443, Fire Watch Procedure, Rev. 8  
NDAP-QA-0444, Fire Alarm Response, Rev. 2  
NDAP-QA-0445, Fire Brigade, Rev. 8  
NDAP-QA-0446, Fire Barrier Program, Rev. 5  
NDAP-QA-0449, Fire Protection Program, Rev. 4

NSEI-AD-145, SFPE Responsibilities in the Fire Brigade Program, Rev. 7  
NTP-QA-53.1, Susquehanna Fire Brigade Training Program, Rev. 15  
OI-013-001, Fire Protection Component Technical Data, Rev. 10  
OI-PM-005, Appendix R Sound Powered Phone System, Rev. 4  
ON-104-001, Unit 1 Response to Loss of All Offsite Power, Rev. 16  
ON-149-001, Loss of RHR Shutdown Cooling Mode, Rev. 21  
OP-116-001, RHR Service Water, Rev. 28  
OP-149-001, RHR System, Rev. 35  
OP-149-002, RHR Shutdown Cooling, Rev. 41  
OP-149-005, RHR Suppression Pool Cooling, Rev. 23  
OP-150-001, RCIC System, Rev. 29  
OP-249-001, RHR System, Rev. 34  
OP-AD-001, Operations Standards for System and Equipment Operation, Rev. 40  
OP-AD-055, Operations Procedure Program, Rev. 9  
SE-100-007, ESW/RHR SW Functional Test at 1C201B, Rev. 5  
SE-149-009, Functional Test of RHR Loop A, CIG and SRV's at 1C201B, Rev. 1  
SE-149-010, Functional Test of RHR Loop B, RHR SW and CIG at 1C201B, Rev. 1  
SE-150-004, RCIC Functional Test at 1C201A, Rev. 0  
SE-249-009, Functional Test of RHR Loop A, RHR Common, RHR SW, CIG and SRV's at  
2C201B, Rev. 1  
SO-013-008, Monthly Hose House 1FH122 and 1FH104 Inspection, Rev. 11  
SO-100-001, Monthly Remote Shutdown Panel Instrumentation Channel Checks, Rev. 20  
TP-100-012, RWCU Functional Test at Remote Shutdown Panel, Rev. 6  
TP-200-012, RWCU Functional Test at Remote Shutdown Panel, Rev. 7

#### Combustible Material Permits

192-08  
193-08  
194-08  
195-08  
196-08

#### Completed Tests/Surveillances

SE-013-001, Three Year Fire Protection System Flow Test, Completed 11/10/06  
SE-013-003, 18 Month CO2 Functional Test, Completed 8/31/05, 2/08/07, 10/03/08  
SE-013-006, 24 Month Inspection of Common Fire Rated Penetration Seals, Completed 11/27/06  
SE-013-007, 24 Month Inspection of Unit Common Fire Barriers, Completed 1/17/08  
SE-113-006, 24 Month Inspection of Unit 1 Fire Rated Penetration Seals, Completed 1/16/08  
SI-013-232, Annual Functional Test of Fire Protection Ionization Detectors, Completed 1/16/06,  
1/18/07, 1/17/08  
SI-013-233, Annual Functional Test of Fire Protection Ionization Detectors, Completed 1/16/06,  
1/18/07, 1/17/08  
SI-013-247, Annual Functional Test of Fire Protection Ionization Detectors, Completed 9/22/06,  
9/29/07  
SI-013-248, Annual Functional Test of Fire Protection Ionization Detectors, Completed 11/07/06,  
11/01/07

SI-113-249, Annual Functional Test of Fire Protection Ionization Detectors, Completed 10/1/07  
SI-113-253, Annual Functional Test of Heat and Ionization Detectors, Completed 7/20/06,  
7/21/07, 7/01/08  
SI-113-257, Annual Functional Test of CO2 System Heat Detectors, Completed 10/20/06,  
10/18/07  
SI-150-312, 24 Month Calibration of Reactor Core Isolation Cooling (RCIC) System Pump Flow  
Channel FT-E51-1N003 (Remote Shutdown Monitoring), Completed 10/19/2007  
SI-180-307, 24 Month Calibration of Reactor Pressure Indication Channel PT-14262 to Remote  
Shutdown Panel, Completed 10/04/2007  
SI-180-308, 24 Month Calibration of RWCU, MSIV, PCIS, SCIS Isolation and CREOASS  
Initiation on RX Vessel Level 2, MSIV Isolation on Rx Vessel Water Level 1 and 4-20 mA  
Analog Loop to Remote Shutdown Panel for Channel LITS-B21-1N026B, Completed  
7/16/2008  
SM-013-005, Diesel Driven Fire Pump 24 VDC Batteries Weekly, Quarterly, and 18 Month  
Checks, Completed 9/24/08  
SM-113-014, Six Month Inspection, Level/Weight Measurement, and Pressure Verification of  
Halon Cylinders, Completed 5/30/07, 11/28/07, 5/28/08  
SO-013-001, Monthly Diesel and Motor Driven Fire Pump Run, Completed 7/28/08, 8/23/08,  
9/23/08  
SO-013-010, Monthly Fire Protection System Valve Alignment Check, Completed 7/30/08,  
8/28/08, 9/26/08  
SO-100-007, Daily Surveillance Operating Log, Completed 10/11/08, 10/12/08, 10/13/08  
SO-100-008, Weekly Surveillance Operating Log, Completed 9/28/08, 10/05/08, 10/12/08  
TP-013-034, Annual Diesel Driven Fire Pump Performance Test, Completed 11/02/07  
TP-013-035, Annual Motor Driven Fire Pump Performance Test, Completed 6/30/07  
TP-013-036, Annual Backup Diesel Driven Fire Pump Performance Test, Completed 10/02/07

#### Operator Training

OP002-05-05-02, Simulator Scenario – Loss of Instrument Bus/Shutdown Outside Control Room,  
Rev. 0  
OP002-07-05-03, Simulator Scenario – SDC Operations from the Control Room and Remote  
Shutdown Panel, Rev. 0

#### Design Change Packages / Evaluations

ECO-556814, Relocate Receptacles in Gypsum Wall Fire Barriers and Inspect and Repair  
Control Structure Barriers as Required, Rev. 0

#### Quality Assurance (QA) Audits and System Health Reports

AR 896276, Assessment of Unapproved/Unanalyzed Storage of Transient Combustibles and  
Station Housekeeping, 9/28/07  
Fire Brigade Training Curriculum Self Assessment, May 2008  
Fire Protection Program Self-Assessment, June 2008 to September 2008  
QA Audit 1027451, Fire Protection Audit Report, 9/24/08

## Drawings

C-1754, Plan of Protected Conduit Raceway, Sheet 5, Rev. 5; Sheet 6, Rev. 5  
 E-1, Single Line Diagram - Station, Rev. 33  
 E-5, Single Line Meter & Relay Diagram 4.16 KV Engineered Safeguards Power System, Rev. 32  
 E-10, Single Line Meter & Relay Diagram 125 VDC, 250 VDC & 120 VAC Systems, Rev. 24  
 E-15, Circuit Breaker Interruption Impact Diagram Panel 1Y236, Sheet 6, Rev. 18  
 E-16, Breaker Interruption Impact Diagram DC Panel 1D614, Sheet 2, Rev. 11; Sheet 3, Rev. 21  
 E-26, Schematic Meter and Relay Diagram 125VDC System, Rev. 34  
 E-64, Power Feeder Tabulation 1D614 and 1D624, Sheet 11, Rev. 24  
 E-64, Power Feeder Tabulation 1Y236 and 1Y246, Sheet 16, Rev. 24  
 E-152, HPCI System Control and Indication – Unit 1, Rev. 13  
 E-180, Schematic Diagram ADS Safety Relief Valves, Sheet 1, Rev. 17; Sheet 2, Rev. 9  
 E-690, Susquehanna S.E.S Unit 1&2 Appendix R Safe Shutdown Manual Actions List, Rev. 5  
 E106316, Unit Common Penetrations Central Control Building, Sheet 60A, Rev. 29; Sheet 60D, Rev. 0  
 E106437, Heating and Ventilation Central Control Building, Sheet 9, Rev. 18; Sheet 18, Rev. 15  
 E106454, Heating and Ventilation Reactor Building, Sheet 5A, Rev. 27  
 E107699, Lighting Control Structure, Sheet 6, Rev. 6; Sheet 5, Rev. 18  
 E205953, Fire Door and Fire Dampers Reactor Building, Sheet 2, Rev. 8  
 E205992, Fire Doors and Fire Dampers Control Structure, Sheet 2, Rev. 5  
 E205993, Fire Doors and Fire Dampers Control Structure, Sheet 2, Rev. 9  
 FF62008, Fire Barrier Upgrade, Sheet A, Rev. 9; Sheet 1, Rev. 2; Sheet 2, Rev. 2; Sheet 26, Rev. 1; Sheet 100, Rev. 1  
 FF62009, Fire Barrier Upgrade, Sheet 231, Rev. 0; Sheet 232, Rev. 0; Sheet 275, Rev. 0; Sheet 276, Rev. 0; Sheet 277, Rev. 0; Sheet 278, Rev. 0; Sheet 289, Rev. 0; Sheet 290, Rev. 0  
 FL-20125, Low Pressure CO2 System, Sheet 4, Rev. N; Sheet 10, Rev. D; Sheet 11, Rev. D  
 J-498, Loop Diagram Remote Shutdown Instrumentation Div I, Sheet 2, Rev. 13  
 J-498, Loop Diagram Remote Shutdown Instrumentation Div II, Sheet 4, Rev. 15  
 M-101, Main Steam System P&ID, Sheet 1, Rev. 38  
 M-111, Emergency Service Water System P&ID, Sheet 1, Rev. 49  
 M-112, RHR Service Water System P&ID, Rev. 48  
 M-141, Nuclear Boiler P&ID, Rev. 49  
 M-149, Reactor Core Isolation Cooling System P&ID, Rev. 48  
 M-151, RHR System P&ID, Rev. 62  
 M-152, Core Spray System P&ID, Rev. 37  
 M-155, HPCI System P&ID, Rev. 49  
 M-1002, Susquehanna S.E.S Unit 1&2 Appendix R Safe Shutdown Component List, Rev. 7  
 M1-B21-129, ADS Elementary Diagram, Sheet 4, Rev. 7  
 M1-E41-69, HPCI System Elementary Diagram, Sheet 5, Rev. 14  
 M1-H12-877, HPCI Elementary Diagram, Sheet 6, Rev. 10

## Pre-Fire Plans

FP-013-155, Fire Zones O-26H, O-26N, O-26P, Rev. 7  
 FP-013-164, Fire Zone O-27E, Rev. 6  
 FP-013-169, Fire Zones O-28B-I, O-28M, O-28N, O-28J, Rev. 4

FP-113-123, Fire Zones 1-5F, 1-5G, Rev. 4  
FP-113-155, Fire Zones 1-4C, 1-4D, Rev. 3

#### Fire Drills and Critiques

Drill Scenarios 2, 6, 9, 10, 11, 12, 20, 40, 42, 43  
Fire Brigade Drill Scenario Use Spreadsheet  
Fire Drill Critiques, Dated 1/18/07, 2/21/07, 7/17/07, 10/03/07, 10/10/07, 12/11/07, 1/15/08,  
1/23/08, 5/13/08, 7/22/08, 7/29/08, 9/23/08, 10/16/08

#### Fire Brigade Training Documents

FB017, Plant Fire Protection, Rev. 0  
FB018, Fire Hazard Identification, Rev. 0  
FB019, Plant Firefighting Plan, Rev. 0  
FB020, Fire Brigade Safety, Rev. 0  
FB021, Fire Protection Review, Rev. 0  
FB022, Hazardous Materials, Rev. 0  
HS013, Fire Watch Training, Rev. 3

#### Vendor Manuals

GEK-75742A, GEK-83263A, Fenwal Halon 1301 Fire Suppression System  
IBD2-808, Ruskin Fire Dampers  
IOM-358, CO2 System, Rev. 2  
IOM-361, Exide Lightguard Emergency and Auxiliary Lighting Units, Rev. 2  
IOM-433, Six and 12 Volt Emergency Lighting Service Manual, Rev. 0  
IOM-827, Six Volt Emergency Lighting Unit Teledyne Big Beam, Rev. 0

#### System Health Reports

120V Lighting and Misc Distribution, 1<sup>st</sup> period 2008, 2<sup>nd</sup> period 2008  
Fire Protection, 1<sup>st</sup> period 2008, 2<sup>nd</sup> period 2008

#### Miscellaneous Documents

Basis Document for Emergency Lighting Unit Maintenance Activities  
Combustible Loading Analysis, 1-4C, O-26H, O-27E, O-28B-I  
Component Data Sheet, Fire Dampers 3-12-9-14, 3-29-5A-3, 3M-12-18-5  
Component Data Sheet, Penetrations X-12-6-D30, X-12-6-D31, X-12-7-D4, X-28-5-3  
DBD 019, Fire Protection, Rev. 4  
DBD 076, Appendix R, Rev. 2  
Emergency Lighting Condition Monitoring Results, 2<sup>nd</sup> period 2008  
Fire Protection Review Report, Rev. 17  
Impairment Log, Dated 10/21/08  
Letter from R. Byram to NRC, SSES Response to NRC Fire Protection Functional Inspection,  
5/13/98

Letter from NRC to SSES, Request for Additional Information regarding IPEEE, Units 1 and 2, dated 3/26/98

Maintenance Rule Basis Document, System 07, 120V Lighting and Misc Distribution, Rev. 5

PLA-4490, Letter from R. Byram to NRC, Susquehanna Steam Electric Station response to request for additional information on IPEEE submittal, Units 1 and 2, Dated 8/6/96

PLA-4505, Letter from R. Byram to NRC, Susquehanna Steam Electric Station Appendix R, Section III.G and III.L Spurious Operations Criteria, Dated 12/6/96

RC 0314, Fire Protection Self Assessment, Dated 6/24/08

Spec 8856-M-323C, Tech Spec for Ventilation Ductwork, Rev. 8

Spec 8856-M-344, Tech Spec for CO2 System for Generator Purge and Fire Protection, Rev. 6

TRM Section 3.7.3

Condition Reports (\* CR initiated as a result of this inspection)

719197	730947	1056484	1082777*
719197	731157	1057210	1082780*
728341	750632	1069854	1083278*
728936	903883	1072134	1084604
730541	903886	1076035	1085354*
730805	907808	1076074	1085749*
730817	917278	1076146	1088690*
730852	1030228	1076282	1089151*
730944	1054506	1082773*	1089470*

Work Orders / Engineering Work Requests

490593	794136	863885	961174
582990	798073	868609	968960
601960	798075	875863	973553
617252	798206	876884	977804
635389	814992	879532	1016664
643910	824115	880131	1021922
646246	824154	880134	1026055
670212	832232	886727	1035270
695155	841849	894745	1049527
705415	842012	905360	1065855
730393	843608	905371	1069940
767420	855439	906951	

### LIST OF ACRONYMS USED

AC	Alternating Current
CFR	Code of Federal Regulations
CR	Condition Report
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EOP	Emergency Operating Procedure
FA	Fire Area
FHA	Fire Hazards Analysis
FPRR	Fire Protection Review Report
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPE	Individual Plant Examination
IPEEE	Individual Plant Examination of External Events
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
OP	Operating Procedure
PAR	Publicly Available Records
P&ID	Piping and Instrumentation Drawing
QA	Quality Assurance
RCIC	Reactor Core Isolation Cooling
RG	Regulatory Guide
RSP	Remote Shutdown Panel
SDP	Significance Determination Process
SER	Safety Evaluation Report
SRV	Safety Relief Valve
SSS	Susquehanna Steam Electric Station
UFSAR	Updated Final Safety Analysis Report