



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

October 27, 2020

Mr. Brad Berryman
President and Chief Nuclear Officer
Susquehanna, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603

**SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 – TRIENNIAL
FIRE PROTECTION INSPECTION REPORT 05000387/2020012 AND
05000388/2020012**

Dear Mr. Berryman:

On October 8, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Susquehanna Steam Electric Station, Units 1 and 2 and discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at Susquehanna Steam Electric Station, Units 1 and 2.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

X /RA/

Signed by: Glenn T. Dentel
Glenn T. Dentel, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos. 05000387 and 05000388
License Nos. NPF-14 and NPF-22

Enclosure:
As stated

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SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 – TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000387/2020012 AND 05000388/2020012 DATED OCTOBER 27, 2020

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000387 and 05000388

License Numbers: NPF-14 and NPF-22

Report Numbers: 05000387/2020012 and 05000388/2020012

Enterprise Identifier: I-2020-012-0006

Licensee: Susquehanna, LLC

Facility: Susquehanna Steam Electric Station, Units 1 and 2

Location: Berwick, PA

Inspection Dates: September 21, 2020 to October 8, 2020

Inspectors: C. Bickett, Senior Reactor Inspector
E. DiPaolo, Senior Reactor Inspector
D. Kern, Senior Reactor Inspector

Approved By: Glenn T. Dentel, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a triennial fire protection inspection at Susquehanna Steam Electric Station, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

Inadequate Diesel-Driven Fire Pump 3-Hour Fire Barrier			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000387,05000388/2020012-01 Open/Closed	None (NPP)	71111.21N.05
The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of Unit 1 License Condition 2.C.(6) and Unit 2 License Condition 2.C.(3) for failure to implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Review Report (FPRR) for the facility and as approved by the NRC. Specifically, Susquehanna failed to enclose the diesel-driven fire pump within a 3-hour rated fire enclosure as described in the FPRR.			

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.21N.05 - Fire Protection Team Inspection (FPTI)

Structures, Systems, and Components (SSCs) Credited for Fire Prevention, Detection, Suppression, or Post-Fire Safe Shutdown Review (IP Section 03.01) (4 Samples)

The inspectors verified that the following systems credited in the approved fire protection program could perform their licensing basis function:

- (1) Fire Protection Water Supply System
- (2) Residual Heat Removal System
- (3) Automatic Depressurization System/Safety-Relief Valves
- (4) Fire Barrier System

Fire Protection Program Administrative Controls (IP Section 03.02) (2 Samples)

The inspectors verified that the following fire protection program administrative controls were implemented in accordance with the current licensing basis:

- (1) Combustible Control Program
- (2) Fire Watch Program

Fire Protection Program Changes/Modifications (IP Section 03.03) (1 Sample)

The inspectors reviewed the following changes to ensure that they did not constitute an adverse effect on the ability to safely shutdown post-fire and to verify that fire protection program documents and procedures affected by the changes were updated:

- (1) Engineering Change 1544685, Fire Pump Replacement

INSPECTION RESULTS

Inadequate Diesel-Driven Fire Pump 3-Hour Fire Barrier			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000387,05000388/2020012-01 Open/Closed	None (NPP)	71111.21N.05
<p>The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of Unit 1 License Condition 2.C.(6) and Unit 2 License Condition 2.C.(3) for failure to implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Review Report (FPRR) for the facility and as approved by the NRC. Specifically, Susquehanna failed to enclose the diesel-driven fire pump within a 3-hour rated fire enclosure as described in the FPRR.</p> <p><u>Description:</u> Both the motor-driven and diesel-driven fire pumps are located in close proximity within the Circulating Water Pump House. The diesel-driven fire pump is located inside an enclosure that was described by the SSES FPRR to be 3-hour fire rated to prevent both fire pumps from being damaged by a single fire, thus affecting their capability to provide fire protection water during an event. During a tour of the Circulating Water Pump House, the team observed a gap, approximately 1-inch wide, in the junction of the diesel-driven fire pump enclosure cinder block wall and the Circulating Water Pump House interior wall. The gap was filled with an unknown board-type material that resembled polystyrene. The team questioned whether the gap and material were depicted on fire barrier drawings of the enclosure.</p> <p>Construction drawings of the Circulating Water Pump House showed the diesel-driven fire pump enclosure walls were 3-hour fire rated but did not depict or note the gap or the filler material. The team noted that the drawings specified the room's ceiling was a poured concrete slab with a gap between the slab and Circulating Water Pump House wall. That gap was specified to be filled with a compressible material.</p> <p>Susquehanna sampled the filler material, concluded it was most likely polystyrene, and that the material was combustible. As a result, the team concluded that Susquehanna failed to enclose the diesel-driven fire pump within a 3-hour rated fire enclosure as described in the FPRR, and both fire pumps were not assured protection from being damaged by a single fire.</p> <p>Corrective Actions: Susquehanna declared the diesel-driven fire pump room fire barrier non-functional and established an hourly fire watch as a compensatory measure. Susquehanna performed an evaluation of the configuration per NRC Generic Letter 86-10. That evaluation concluded the deficient condition did not negatively impact the barrier's ability to prevent a single fire from disabling both the motor-driven and diesel-driven fire pumps.</p> <p>Corrective Action References: CR-2020-13254 and CR-2020-13799</p> <p><u>Performance Assessment:</u></p> <p>Performance Deficiency: The team determined that the failure to enclose the diesel-driven fire pump within a 3-hour fire rated enclosure, as described in Section 4.1 of the SSES FPRR, was a performance deficiency that was within Susquehanna's ability to foresee and correct. As a result, both fire pumps (i.e., the motor-driven fire pump and the diesel-driven fire pump) were not assured protection from being damaged by a single fire.</p>			

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Protection Against External Factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failing to enclose the diesel-driven fire pump within a 3-hour rated enclosure did not assure that both fire pumps were protected from being damaged by a single fire which could have affected their capability to provide fire protection water during a fire event. In addition, this finding is more than minor because it was similar to Example 3.g of IMC 0612, Appendix E, "Examples of Minor Issues." Regardless of the final operability or functionality, the as-found condition was such that there was reasonable doubt with respect to the availability, reliability or capability of systems.

Significance: The inspectors assessed the significance of the finding using Appendix F, "Fire Protection and Post - Fire Safe Shutdown SDP." Appendix F was applicable in this case because the finding was associated with fire water supply systems. This issue screened as Green in Step 1.4.3 because adequate fire water capacity was still available for protection of equipment important to safe shutdown in the most limiting location onsite. Susquehanna performed a detailed evaluation of the arrangement in the Circulating Water Pump House. The evaluation concluded that the deficient condition did not negatively impact the degraded fire barrier's ability to prevent a single fire from disabling both the motor-driven and diesel-driven fire pumps. In addition, the site is equipped with a backup diesel-driven fire pump, remote to the Circulating Water Pump House, that could be placed in service per plant operating procedures.

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance. The installation of the non-fire rated material used as a fire barrier was performed during the construction of the diesel-driven fire pump enclosure. Although a periodic inspection is performed on Circulating Water Pump House fire barriers, the scope of the inspection was to visually identify degradation that could prevent barriers from meeting their design function. The inspectors concluded that identification of incorrect fire barrier material was beyond the scope of the periodic inspection.

Enforcement:

Violation: Unit 1 License Condition 2.C.(6) and Unit 2 License Condition 2.C.(3), in part, requires Susquehanna Nuclear, LLC to implement and maintain in effect all provisions of the approved fire protection program as described in the FPRR for the facility and as approved by the NRC. SSES FPRR, Section 4.1, Fire Protection Water Supply System, stated that the diesel-driven fire pump is enclosed within a 3-hour fire rated enclosure which prevents both fire pumps (i.e., the motor-driven fire pump and the diesel-driven fire pump) from being damaged by a single fire.

Contrary to the above, since July 17, 1982, the effective date of the Unit 1 operating license, until September 24, 2020, when the issue was entered into the corrective action program, Susquehanna failed to enclose the diesel-driven fire pump within a 3-hour fire rated fire enclosure which prevents both fire pumps from being damaged by a single fire.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On October 8, 2020, the inspectors presented the triennial fire protection inspection results to Mr. Brad Berryman and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.05	Calculations	EC-013-0852	Evaluation for Identification and Disposition of Appendix R Section III.G Non-Compliant Cables	Revision 1
		EC-013-1031	Documentation to Support Qualification of the Penetration Seal Installation at SSES	Revision 3
		EC-013-1040	Combustible Loading Data for Input to CRIMP	Revision 5
		EC-013-1040	Combustible Loading Data for Input to CRIMP	Revision 5
		EC-013-1873	Operator Manual Actions Feasibility Analysis	Revision 4
		EC-018-0843	SSES 10 CFR 50 Appendix R Compliance Manual	Revision 47
		EC-083-0660	Number of Open SRVs Required in Shutdown Cooling	Revision 1
		EC-PUPC-20400	EPU Task Report T0400 - Containment System Response	Revision 5
		EC-THYD-1064	MAAP Analysis of Appendix R Scenarios	Revision 3
	Corrective Action Documents	CR 2018-08886		
		CR-2016-22822		
		CR-2017-19925		
		CR-2018-02016		
		CR-2018-06103		
		CR-2018-07710		
		CR-2018-14540		
		CR-2018-16833		
		CR-2018-17185		
		CR-2019-04113		
		CR-2019-12711		
		CR-2019-13600		
		CR-2020-07321		
		CR-2020-11023		
	CR-2020-12789			
	Corrective Action Documents Resulting from Inspection	NCR 87-0898		
		AR-2020-12955		
		AR-2020-13012		
		AR-2020-13081		
			AR-2020-13149	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AR-2020-13241		
		AR-2020-13247		
		CR-2020-13030		
		CR-2020-13032		
		CR-2020-13103		
		CR-2020-13229		
		CR-2020-13230		
		CR-2020-13254		
		CR-2020-13270		
		CR-2020-13271		
		CR-2020-13419		
		CR-2020-13439		
		CR-2020-13570		
		CR-2020-13756		
		CR-2020-13771		
		CR-2020-13779		
		CR-2020-13782		
		CR-2020-13783		
		CR-2020-13851		
		CR-2020-13896		
	CR-2020-13899			
	CR-2020-13912			
	Drawings	D-107415	Fire Protection Engine Driven Fire Pump Control Scheme 0S1401, Sheet 1	Revision 12
		D-193314	Circuit Breaker Interruption Impact Diagram 208/120V AC Panel 1Y629, Sheet 54	Revision 7
E-105012, Sheet 1		Circulating Water Pumphouse Water Treatment Building Fire Protection	Revision 5	
E-105566		Circulating Water Pumphouse and Water Treatment Building Sections and Details	Revision 3	
E-106227, Sheets 1, 2, 3, and 6		Fire Protection System	Revision 61	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date		
		E-266	Motor Driven Fire Pump 0P512 and Jockey Fire Pump 0P543, Sheets 1 and 2	Revision 14		
		E-690, Sheet 1	Appendix R Safe Shutdown Manual Actions List	Revision 8		
	Engineering Changes	EC 1544685	Fire Pump Replacement Project	Revision 9		
	Engineering Evaluations			86-10 Fire Hazards Analysis Evaluation for Diesel-Driven Fire Pump Fire Barrier Gap	10/06/2020	
				Fire Protection Screening Document 00109, Fire Pump Replacement	01/16/2015	
				Maintenance Rule Evaluation 0S573 (Back-up Diesel Driven Fire Pump) Charge Air Cooler Gasket Leak	07/16/2020	
			50.59 SD 02291	Maintaining Door 571D in the Open Position	Revision 0	
			C-1072	Specification for the Inspection of Fire Barriers for Compliance with PPL Susquehanna LLC Technical Requirements Manual	Revision 6	
			CR 1198879	Evaluation of NRC Information Notice 2009-29, Potential Failure of Fire Water Supply Pumps to Automatically Start Due to a Fire		
			E-1012	Electrical Separation Criteria	Revision 2	
			EC-013-1027	Technical Evaluation of Fire Barrier Surveillance Requirements	Revision 8	
			Engineering Work Request 631730	Investigate the Physical Separation of Cable for 0P512 and 0P511	01/31/2007	
			FPSD 00160	Fire Protection Program Screen for Maintaining Door 571R in the Open Position	Revision 0	
			SSES-1-LI-012-ME-002-R0	Fire Pump Upgrade Replacement Project-Code Compliance Review	Revision 0	
		Miscellaneous			Vendor Manual 0S573M JU/JW/JX Models Electronic Engines for Fire Pump Applications	March 2017
					Susquehanna Steam Electric Station Fire Protection Review Report	Revision 24
				Time Critical and Time Sensitive Operator Action Validation per NDAP-QA-0343	2016	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			TCOA Event #34 Validation	10/05/2020
			Vendor Technical Manual-Torna Tech-Operation, Installation and Maintenance for Diesel Engine Fire Pump Controller, Model GPD	
		9502-09	TRAK2000 Cable Management System (CRIMP) Software Verification & Validation Results Report	Revision 20
		IEEE-384-1974	IEEE Trial-Use Standard Criteria for Separation of Class 1E Equipment and Circuits	
		IEEE-384-2008	IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits	
		LDCN 5331	Fire Water Treatment Technical Change	01/05/2018
		NFPA 20-1974	Centrifugal Fire Pumps	
		OT-013-019	Diesel Driven Fire Pump 0P511 Performance Test	August 2019
		OT-013-020	Motor Driven Fire Pump 0P512 Performance Tes	January 2019
		OT-013-021	Backup Diesel Driven Fire Pump 0P592 Performance Test	June 2020
		PT-013-042	24 Month Inspection of Non-Reg Fire Rated Assemblies/Barrier	Revision 8
		SO-013-001	Monthly Diesel and Motor Driven Fire Pump Run	August 2020
		SO-013-001B	Monthly Backup Diesel Fire Pump Run	August 2020
		TP-013-065	EC 1544685 Partial 3 Initial Field Acceptance Testing	October 2016
		TP-013-066	EC 1544685 Partial 2 Initial Field Acceptance Testing	October 2016
		TP-013-250	EC 1544685 Partial 1 Initial Field Acceptance Testing	December 2015
		TRM 3.7.3	Suesquehanna Unit 1 Technical Requirements Manual, Fire Protection	03/31/2006
	Procedures	AOP-149-001	RHR Abnormal Operating Procedure	Revision 4
		AOP-151-001	Core Spray Abnormal Operating Procedure	Revision 2
		DC-OP-011	Post-Fire Recovery Actions	Revision 18
		EO-100-030	Unit 1 Response to Station Blackout	Revision 40
		LA-0526-001	Diesel Fire Pump Control Panel 0C526	Revision 5
		NDAP-QA-0101	Document Review	Revision 8

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		NDAP-QA-0343	Time Critical and Time Sensitive Operator Actions	Revision 4
		NDAP-QA-0440	Control of Transient Combustible/Hazardous Materials	Revision 23
		NDAP-QA-0443	Firewatch Procedure	Revision 17
		NDAP-QA-0446	Fire Barrier Program	Revision 11
		NDAP-QA-0449	Fire Protection Program	Revision 19
		NSEP-AD-0440	Fire Protection Program License Renewal Program Basis Document	Revision 23
		ON-013-001	Response to Fire	Revision 50
		ON-SDC-101	Loss of Shutdown Cooling	Revision 4
		OP-013-001	Fire Protection System	Revision 61
		OP-013-003	Backup Fire Protection System	Revision 35
		SE-013-006	24-Month Inspection of Common Fire Rated Penetration Seals	Revision 13
		SE-013-007	24 Month Inspection of Unit Common Fire Barriers	Revision 12
		SE-013-008	6 Month Inspection of Common Fire Doors	Revision 14
		SE-013-009	24 Month Inspection of Fire Windows/Fire Dampers and Associated Hardware	Revision 7
		SE-113-006	Unit 1 24 Month Inspection of Fire Rated Penetration Seals	Revision 12
		SE-113-007	24 Month Inspection of Unit 1 Fire Barriers	Revision 14
		SE-113-008	6 Month Inspection of Unit 1 Fire Doors	Revision 12
		SE-213-006	Unit 2 24 Month Inspection of Fire Rated Penetration Seals	Revision 11
		SE-213-007	24 Month Inspection of Unit 2 Fire Barriers	Revision 14
		SE-213-008	6 Month Inspection of Unit 2 Fire Doors	Revision 13
		SO-100-007	Daily Operations Surveillance	09/17/2020
		SO-200-007	Unit 2 Daily Operations Surveillance	09/16/2020
		Self-Assessments		Fire Protection Program Self-Assessment
	Work Orders	RTSV 1910271		
		RTSV 1910555		
	RTSV 1910555			
	RTSV 1996346			

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		RTSV 2004186		
		RTSV 2072714		
		RTSV 2077949		
		RTSV 2170087		
		RTSV 2184813		
		WO 2182656		
		WO 2296915		