



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

December 5, 2016

Mr. George Lippard III, Vice President
Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88, Mail Code 800
Jenkinsville, SC 29065

**SUBJECT: V.C. SUMMER NUCLEAR STATION, UNIT 1 – NRC TRIENNIAL FIRE
PROTECTION INSPECTION REPORT 05000395/2016010**

Dear Mr. Lippard:

On October 21, 2016, the U.S. Nuclear Regulatory Commission (USNRC) completed an inspection at your V.C. Summer Nuclear Station, Unit 1 and discussed the results of this inspection with you and other members of your staff. The team continued in-office reviews at the conclusion of the inspection and held a re-exit on December 1, 2016, with members of your staff. The inspection team documented the results of this inspection in the enclosed inspection report.

The NRC team documented three Green findings that were determined to be violations of NRC requirements. The team is also documenting two NRC identified traditional enforcement (TE) severity level (SL) IV, and one licensee-identified (LIV) violations in applicable sections of this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy. If you contest the characterization of a violation or the significance, 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 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, U.S Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the V.C. Summer Nuclear Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, RII, and the NRC Resident Inspector at the V.C. Summer Nuclear Station.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Scott M. Shaeffer, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos.: 50-395
License Nos.: NPF-12

Enclosure:
Inspection Reports 05000395/2016010
w/Attachment: Supplemental Information

cc: Distribution via Listserv

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Letter to G. Lippard from Scott M. Shaeffer dated December 5, 2016.

SUBJECT: V.C. SUMMER NUCLEAR STATION, UNIT 1 – NRC TRIENNIAL FIRE
PROTECTION INSPECTION REPORT 05000395/2016010

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-395

License Nos.: NPF-12

Report Nos.: 05000395/2016010

Licensee: South Carolina Electric & Gas (SCE&G) Company

Facility: Virgil C. Summer Nuclear Station, Unit 1

Location: P.O. Box 88
Jenkinsville, SC 29065

Dates: October 3 – October 7, 2016 (Week 1)
October 17 – October 21, 2016 (Week 2)

Inspectors: P. Braaten, Reactor Inspector
J. Dymek, Reactor Inspector
R. Fanner, Senior Reactor Inspector (Lead Inspector)
M. Singletary, Reactor Inspector
D. Terry-Ward, Construction Inspector (Electrical)
H. Barrett, Senior Fire Protection Engineer

Other: D. Strickland (Week 1, Training)
W. Satterfield (Week 1, Training)

Approved by: Scott M. Shaeffer, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY

IR 05000395/2016010; 10/03/2016 – 10/07/2016 and 10/17/2016 – 10/21/2016; V.C. Summer Nuclear Station Unit 1; Fire Protection - NFPA 805 (Triennial)

This report covered an announced two-week triennial fire protection inspection by a team leader, four regional inspectors, and one Office of Nuclear Reactor Regulation (NRR) observer. Three Green non-cited violations (NCVs), two severity level (SL) IV violations, and one licensee-identified violations (LIV) were 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) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors as described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

Cornerstone: Mitigating Systems

- SL IV. The NRC identified a SL IV, non-cited violation (NCV) of the 10 CFR 50.48(c), "National Fire Protection Association Standard (NFPA) 805," requirements. Specifically, the team identified the licensee's inability to ensure licensing basis information was maintained consistent with administrative procedures to support the NFPA 805 Section 2.2(j) and NFPA 805, Section 2.7 requirements.

The licensee's failure to meet the quality requirements specified by NFPA 805 Section 2.2. (j) and NFPA 805, Section 2.7, Program Documentation, Configuration Control and Quality was a performance deficiency (PD). This PD was determined to be more than minor because it affected the regulatory process. In this instance, the licensee failed to ensure information to support the NFPA 805 licensing commitments was controlled in the manner specified by the requirement. This information served as the basis for the NRC to perform its regulatory function and had the ability to impact the credited analysis relied upon to reach and maintain safe and stable conditions in case of a fire. As a result, the team evaluated the finding using the traditional enforcement (TE) process based upon the guidance in NRC Enforcement Policy and NRC Enforcement Guidance. The team reviewed the NRC Enforcement Guidance, Part II, Section 2.2, "Actions Involving Fire Protection," to aid assessing the significance of the issue and determined the issue to be a SL IV. A cross cutting aspect was not assigned based upon the TE determination. The licensee initiated CR-16-05060, CR-16-05074, CR-16-05160, CR-16-05276, and CR-16-05278 to address the NRC concerns. (Section 1R05.06)

- Green. The NRC identified a Green, non-cited violation (NCV) of the 10 CFR 50.54(hh)(2) requirements. Specifically, the team identified aspects of the implementation strategy that were inconsistent to support the stated commitments.

The licensee's failure to ensure that credited components needed to implement the strategy were adequate for circumstances consistent with the stated commitments was a performance deficiency (PD). This PD was determined to be more than minor because of the adverse impact to the Mitigating Systems cornerstone objective. Specifically, the PD had the ability of impacting the availability and reliability of the credited strategy in response to conditions postulated to meet the 10 CFR 50.54hh requirements. The team screened the

issue as Green using IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined that further screening was necessary consistent with IMC 0612, Appendix L, "B.5.b Significance Determination Process." Dated December 24, 2009. In this instance, the finding was determined to be of Green significance since no additional strategies were impacted. The licensee initiated CR-16-05266 to address the NRC concerns. (Section 1R05.16)

- Green. The NRC identified a Green, non-cited violation (NCV) for the failure to include potentially high-risk fire scenarios in the current fire protection program. In this instance, the team identified unsealed electrical cabinets credited as being sealed.

The licensee's failure to identify and assess the applicable electrical cabinet as a fire-scenario in its FSA database was a performance deficiency (PD). This PD was determined to be more than minor because of the adverse impact to the Mitigating Systems cornerstone objective. Specifically, the PD resulted in an incomplete fire risk model. The licensee performed an analysis of the performance deficiency using their fire probabilistic model and the results were that the PD represented a risk increase of $<1.0\text{E-}6/\text{year}$ in core damage frequency and $<1.0\text{E-}7/\text{year}$ in large early release fraction. The licensee's results were reviewed by a regional senior reactor analyst (SRA). Additionally, a bounding analysis was performed by the regional SRA in accordance with NRC IMC 0609 Appendix F which concluded that the core damage frequency risk increase due to the PD was $<1.0\text{E-}6/\text{year}$, a GREEN finding of very low safety significance.

The team assessed the issue consistent with IMC 0310, "Aspects Within Cross Cutting Areas," dated December 4, 2014, and determined the finding to have a cross-cutting aspect of Field Presence (H.2) in the Human Performance area because the licensee did not ensure that senior managers and supervisory staff maintained the proper amount of oversight of contractors and supplemental personnel in the performance work activities relevant to fire protection program implementation. The licensee has fire watches in place as a compensatory measure and has entered this issue into their corrective action program as CR-16-05287. (Section 1R05.15)

- SL IV. The NRC identified a SL IV, non-cited violation (NCV) of the 10 CFR 50.48(c), "NFPA 805," requirements. Specifically, a Risk Informed Change was made that was inconsistent with Transition License Condition 2.C.18.(c).1 which stated in part: "Before achieving full compliance with 10 CFR 50.48(c), ...risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval." In this instance, the team identified the licensee failed to seek or gain NRC approval for risk-informed changes that had a more than minimal risk impact to the fire protection program during the post-safety evaluation issuance period date of February 11, 2015.

The licensee's failure to obtain NRC approval prior to making any changes to the 2.C.18 license requirements was a performance deficiency (PD). This PD was determined to be more than minor because it impacted the regulatory process. Specifically, the team determined that risk-informed changes made to a commitment specified by license condition 2.C.18.(c).1, which was based upon docketed correspondence from the licensee, required NRC approval. The licensee deviated from the stated commitments without NRC approval which formed the basis for the team decision to evaluate the finding using traditional enforcement (TE) based upon the guidance in NRC Enforcement Policy. The team reviewed NRC Enforcement Guidance, Part II, Section 2.2, Actions Involving Fire Protection,

to assess the significance of the issue and determined the issue to be a SL IV. The licensee initiated CR-16-01490 and CR-16-05291. (Section 1R17)

- Green. The NRC identified a Green non-cited violation (NCV) of the V.C Summer Nuclear Station, Unit 1, Renewed Facility Operating License (FOL) Condition 2.C.18 requiring the licensee to implement and maintain in effect all provisions of the approved FPP that complied with 10 CFR 50.48 (c), "National Fire Protection Association Standard NFPA 805." The NRC safety evaluation report (SER) dated February 11, 2015, relied upon an adequate corrective action program to implement the NFPA 805 requirements. NFPA 805 Section 2.6.3, Corrective actions. Specifically, the team identified a failure to adequately classify and correct conditions adverse to quality (CAQ) in a timely manner.

The licensee's failure to properly assign an action level commensurate to ensure corrective actions were addressed consistent with the NFPA 805, Section 2.6.3 was a PD. The PD was more than minor because, if left uncorrected, it could lead to more significant safety concern. Specifically, the inadequate application of the corrective action program can lead to deficiencies degrading SSCs which can adversely impact the FPP requirements and lead to a more significant safety concern. The finding was screened in accordance with IMC 0612, Appendix B, Issue Screening, dated September 7, 2012, and IMC 0609, Attachment 4, "Characterization of Findings" dated October 7, 2016. A determination was made using IMC 0609, "Significance Determination Process," dated April 29, 2015. Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012 was applicable since the administrative controls in this instance were not associated with transient or hot work activities. Using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because it did not represent an actual loss of safety function.

The team assessed the finding against the IMC 0310, "Cross-cutting Aspects," dated December 4, 2014, requirements and determined that cross-cutting was applicable. In this instance, the cause of this finding was determined by the team to have a cross-cutting aspect of the Resolution component (P.3) of the Problem Identification and Resolution (PI&R) area. This was selected based upon the inability organization to adequately identify and take effective corrective actions to address issues in a timely manner commensurate administrative procedures to meet the NFPA 805, Section 2.6.3 requirements. The licensee initiated CR-16-05306 and CR-16-05160, Action 1 related to this issue. (Section 4OA2)

A. Licensee-identified Findings

A violation of very low safety significance that was identified by the licensee has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R05 Fire Protection

This report documents the results of a Triennial Fire Protection Inspection (TFPI) at the V.C. Summer Nuclear Station (VCSNS), Unit 1. The inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05XT, "Fire Protection - NFPA 805 (Triennial)," issued January 31, 2013. Additionally, IP 71111.17T, "Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications," issued November 13, 2015, was used to review a sample of engineering change requests (ECRs). These ECRs were associated with committed modifications that served as the foundational basis, along with other attributes, of ensuring the V.C. Summer facility achieved the fire risk reductions as the program transitioned to full compliance with the 10 CFR 50.48(c) requirements and the modified fire protection license condition. The inspection objective was to review a minimum sample of two risk-significant Fire Areas (FAs)/Fire Zones (FZs) and one deterministic (FA) to verify implementation of the VCSNS Fire Protection Program (FPP). An additional objective was to review site specific implementation of one mitigating strategy from Section B.5.b of NRC Order EA-02-026, "Order for Interim Safeguards and Security Compensatory Measures" (commonly referred to as B.5.b), as well as the storage, maintenance, and testing of B.5.b mitigating equipment associated with compliance requirements.

The team selected two performance based FAs and one deterministic FA based on available risk information as analyzed onsite by the team leader and a senior reactor analyst from Region II, data obtained from in-plant walkdowns regarding potential ignition sources, location and characteristics of combustibles, and location of equipment needed to achieve and maintain the reactor in a safe and stable condition. Other considerations for selecting the FAs included, the relative complexity of the post-fire safe shutdown (NSCA) procedures, information contained in FPP documents, and results of prior NRC TFPIs. In selecting the B.5.b mitigating strategy sample, the team reviewed licensee submittal letters, safety evaluation reports (SERs), licensee commitments, B.5.b implementing procedures, and previous NRC inspection reports. This inspection fulfilled the requirements of the procedure by selecting a sample of three FAs and one B.5.b mitigating strategy.

- Fire Area CB-15, Upper Cable Spreading Room Based [Performance based]
- Fire Area IB-22, 1B 1DB Switchgear Room (7.2kv) [Performance based]
- Fire Area TB-03, Turbine Building Switchgear Room [Deterministic]

For each of the selected FAs, the team evaluated the licensee's FPP against applicable NRC requirements and licensee design basis documents. Documents reviewed by the team are listed in the Attachment.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team assessed the licensee's ability to, in the event of a fire, provide a safe shutdown (SSD) success path to meet the established nuclear safety goals, objectives and performance criteria. The team examined the VCSNS fire response Abnormal Operating Procedures (AOPs), DBD-FP NFPA 805, nuclear safety capability assessment (NSCA), Fire Risk Evaluations (FRE), Technical Reports, Calculations, Fire/Circuit Analysis, Fire Modeling, systems flow diagrams, and other documentation that supported the design basis, to determine if equipment required to achieve post-fire safe and stable plant conditions was properly identified and adequately protected from fire damage in accordance with the requirements of 10 CFR 50.48(c) and the VCSNS approved FPP.

The team reviewed cable routing information for a selected sample of NSCA equipment and components to verify that either the associated cables would not be damaged for the selected fire scenarios in respective FAs or the licensee's analysis/risk insights determined that the fire damage would not prohibit achieving safe and stable plant conditions.

The team reviewed applicable sections of the respective administrative procedures (APs) based upon the licensing commitments and the selected FAs, to ensure the postulated fire scenarios were identified to ensure the shutdown methodology components and systems necessary to achieve and maintain safe and stable plant conditions remained available.

The team conducted interviews of plant operators to ascertain their knowledge of procedural actions needed to reach a safe and stable condition based upon fire events. The team also reviewed recovery and defense-in-depth operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits. A list of NSCA components examined for cable routing is included in the Attachment.

b. Findings

No findings were identified.

.02 Passive Fire Protection

a. Inspection Scope

The team reviewed licensing basis documentation such as 10CFR 50.48(a), 10CFR50.48(c) and the NRC NFPA 805 Safety Evaluation Report (SER), DBD-FP NFPA 805, to assess the passive fire protection per licensing commitments. The team conducted walkdown inspections, examined the structural material condition, and the as-built configuration of accessible passive barriers surrounding and within the FAs selected for review to evaluate the adequacy of their fire resistance in accordance with NFPA 805 calculations. The team compared the as-built installed barrier configurations to the approved construction details and supporting fire endurance test data, which established the rating of the fire barriers. Among the fire barriers inspected included

masonry walls, poured concrete ceilings, floors and walls and installed mechanical and electrical penetration seals, fire doors and fire dampers. Fire doors and dampers were examined for attributes such as their material condition, clearances, proper operation, Underwriters Laboratory (UL) labels on the door and frame, and the method of attachment to the rated barrier. Additionally, doors were examined to verify that modifications had not been performed to void their UL listing. In addition, a sample of completed surveillances and maintenance procedures for selected fire doors, fire dampers and penetration seals were reviewed to ensure that these passive barriers were being properly inspected and maintained.

b. Findings

No findings were identified.

.03 Active Fire Protection

a. Inspection Scope

The team reviewed the licensee's fire detection systems, manual and automatic water-based fire suppression systems and firefighting standpipe and hose systems protecting the selected FAs. Fire brigade pre-plans, training and fire response procedures for these areas were also reviewed. The team reviewed the adequacy of the design, installation and operation of the fire detection and alarm systems to promptly detect fires in the selected fire areas and to annunciate to the fire alarm control panel in the control room. The review included walkdowns of as-built configurations and an examination of the type of detectors, detector spacing, the licensee's technical evaluations of the detectors location relative to ignition sources, room geometry and fixed obstructions to assess whether the areas were protected in accordance with code of record requirements.

The team also reviewed the licensee's fire alarm response procedures, fire protection design basis document (DBD), NFPA 805 License Amendment Request (LAR) submittals and associated NRC NFPA 805 SER, to verify that the fire detection and alarm systems for the selected FAs were installed in accordance with the design and licensing basis for the plant.

The team reviewed the firefighting pre-plans and fire response procedures for the selected FAs to determine if appropriate information was provided to fire brigade members to facilitate suppression activities. These plans were reviewed and confirmed by field walkdowns to verify that they accurately reflected current plant configurations and firefighting equipment locations. These walkdowns also confirmed that fire hose and extinguisher access was properly maintained throughout the plant. The team evaluated whether the fire response procedures and pre-plans could be implemented as intended and that they addressed equipment important to safety, ventilation of heat and smoke from a fire and drainage/runoff from installed fixed fire suppression systems and manual hose streams. Additionally, fire brigade drill records for recent drills were reviewed to confirm drill scenarios addressed the specific hazards likely to be encountered in the areas as well as verified the actual fire brigade response times supported the fire brigade response time performance basis criteria.

The team also observed an actual drill crediting the use of manual suppression for a postulated fire.

b. Findings

No findings were identified.

.04 Protection from Damage from Fire Suppression Activities

a. Inspection Scope

The team verified the licensee provided one success path necessary to achieve and maintain the nuclear safety performance criteria for the applicable sample areas. The team assessed the effects of the application of suppression systems for the chosen FA samples to ensure a rupture or inadvertent operation would not challenge the nuclear safety performance criteria. The team reviewed drawings and other information to assess if drains credited were adequate for the circumstances. The team performed walkdowns of the applicable areas to gain insights on smoke migrations and its effects. The team observed the operability of suppression systems, automatic or manual, to assess if the impacts would challenge established criteria.

b. Findings

No findings were identified.

05 Shutdown from a Primary Control Station

a. Inspection Scope

The team assessed the licensee's primary control stations(s) (PCS) to ensure an adequate and timely shutdown was capable of being implemented due to a fire event. A PCS is a command and control location that has been reviewed and approved by the NRC. The team reviewed various licensing correspondence to understand the licensing basis. The team assessed the attributes to meet these requirements through coordinated efforts between the operations and electrical staff.

Methodology

The team assessed the adequacy of applicable systems to support the criteria for reactivity control, inventory and pressure control, decay heat removal, vital auxiliaries, and process monitoring. The team reviewed the licensee's FPP, system flow drawings, electrical drawings, and other supporting documents used to achieve the NFPA 805 Nuclear Safety Performance Criteria consistent with licensing basis requirements. The team also reviewed maintenance procedures for the testing and transfer of functions to the primary control station, to ensure the adequacy of procedures. For postulated fire scenarios in CB-15, which may impair main control room (MCR) functions, the licensee credited shutdown from the Control Room Evacuation Panel (CREP) to achieve safe and stable plant conditions. This would involve transferring plant controls from the MCR to the CREP. The team reviewed and assessed electrical schematic drawings to verify that circuits for SSD equipment, which could be damaged due to fire, were isolated by disconnect switches and provided alternate power by swapping power supplies to

alternate motor control centers (MCCs). The reviews focused on ensuring that the required functions for post-fire safe and stable conditions and the corresponding equipment necessary to perform those functions were included in the fire response procedures.

Operational

The team reviewed AOP-900.02, "Control Room Evacuation Due to Fire" Rev. 0, to ensure adequacy of the strategy to reach a safe and stable plant condition from a PCS. The team performed table-top exercises of the procedure with a licensed operator to gain insights on the procedure adequacy. The inspectors also conducted in-plant walkdowns of the procedure with licensed operators to verify and assess the feasibility and reliability of actions credited to reach a safe and stable condition. The team verified the training program for licensed and non-licensed personnel included guidance for meeting the nuclear safety performance criteria. The team reviewed a sample of actions to assess the human reliability analysis (HRA) consistent with established guidance and stated commitments per SER Section 3.4.4. The team assessed the operational aspects of the licensee's ability to isolate circuit controls credited at the PCS from the main control room (MCR).

b. Findings

No findings were identified.

.06 Circuit Analysis

a. Inspection Scope

The team reviewed the licensee's ability to identify circuits required to ensure the nuclear safety functions were available for a postulated fire. To accomplish this, the team reviewed the SER, Updated Final Safety Analysis Report (UFSAR), DBD-FP NFPA 805, Technical Reports, Calculations, Fire and Circuit Analysis, and Fire Modeling documentation. The team reviewed and verified the licensee identified the impact to safe shutdown by reviewing cable routing, conduit/tray drawings, calculations, technical reports, and other support documentation. The team assessed the licensee's ability to properly identify required and associated circuits that could impact the ability to achieve and maintain safe and stable conditions for the selected FAs. The inspectors assessed whether the licensee identified structures, systems and components (SSCs) important to meeting the 10 CFR 50.48 requirements were consistent with the established licensing basis. This included assessing and performing walkdowns of the applicable areas and sampling the ignition source and cables specified within the applicable reports specified above. These walk-downs were done to independently verify the assumptions and results reached by the licensee's fire scenario development analysis.

The team verified, on a sample basis, that cables associated with safe shutdown-related equipment were protected from the adverse effects of fire damage or were analyzed to show that fire induced cable faults would not prevent shutdown to safe and stable conditions.

The team also reviewed, on a sample basis, breaker/fuse vendor documentation and several ECR packages to ensure proper coordination existed between load and

incoming supply breakers. The team reviewed the licensee's electrical breaker coordination study calculation's to determine if power supplies were susceptible to fire damage, which would potentially affect the credited components for the FAs chosen for review. The team also reviewed cable routing, cable bus layout and simplified plant electrical distribution drawings, electrical one-line, three-line and component block diagrams, penetration, cable tray arrangement and conduit plan drawings, along with electrical schematic and control wiring diagrams for the selected components to determine if these cables had either been adequately protected from the potential adverse effects of fire damage or analyzed to show that fire induced faults would impact the nuclear safety performance criteria.

In addition, the team reviewed cable routing information to verify that fire protection features were in place to satisfy the requirements specified in the fire protection licensing basis and the licensee's evaluations for spurious circuit failure scenarios (single and/or multiple) specified in the circuit analysis to determine if the sample list of components challenged the assumptions made in the analysis. The specific components and references reviewed are listed in the Attachment.

b. Findings

Introduction: The NRC identified a SL IV, NCV of the 10 CFR 50.48(c), "National Fire Protection Association Standard NFPA 805," requirements. Specifically, the team identified the licensee failed to meet the requirements specified NFPA 805 Section 2.2(j) and NFPA 805, Section 2.7.

Description: For the chosen areas, the team reviewed the licensee submittal RC-11-0149 which served as a subset of other licensee submittals used to establish the foundation of the NFPA 805 licensing basis. The team reviewed the design basis document for fire protection, "NFPA 805 Fire Protection (FP)," Rev. 0 whose purpose was to document the fire protection design basis and demonstrate how the V. C. Summer Nuclear Station (VCSNS) Unit 1, complied with the requirements specified by 10 CFR 50.48(a) and 10 CFR 50.48(c). The team reviewed TR07800-009, "NFPA 805 and Fire PRA Circuit Analysis," whose purpose was to document the approach, methodology, criteria, and the results for the VCSNS cable selection and circuit analysis. In addition, this report also served as the basis to facilitate management of the future NFPA 805 program and Fire PRA. In essence, this document served as the foundational basis for the development of the Nuclear Safety Capability Assessment (NSCA) and also included, in part, a review and assessment of the VCSNS electrical coordination and protection calculations.

The team reviewed TR08620-312, "Nuclear Safety Capability Assessment (NSCA) Report Fire Shutdown Analysis," Rev. 1, whose purpose was to serve as the framework for the fire analysis. In this instance, the NSCA along with the TR07800-009 technical report provided, in part, the basis for the license amendment request (LAR) submitted on behalf of the V.C. Summer Nuclear Station staff to the NRC. This LAR, upon approval by the NRC, established the licensing basis for the Fire Protection Program at the V.C. Summer Nuclear Station. As a result, applicable sections of NFPA 805, Section 2 requirements utilized the applicable information referenced within the NSCA and the DBD as the source document for meeting these standard requirements. In further analysis by the team, it was determined that the TR07800-009 was credited by the

licensee in meeting the requirements specified by NFPA 805, Section 2.4.2.1, 2.4.2.2, and 2.4.2.3.

The team reviewed the fire protection program administrative procedure, SAP-0131, "Fire Protection Program," Rev. 10, Section 5.5.1, which stated that technical reports used to support the FP design basis shall be maintained. At the time of the inspection, the TR07800-009 technical report was not up to date based upon the observed 9/14/11 date. The team performed interviews with applicable licensee staff and ascertained from conversations that the V.C. Summer staff had no intentions of updating technical reports or other documents since these were thought by the licensee staff to be legacy documents. The licensee personnel were under the impression that the PCCKS database was used as the licensing basis.

Based upon NRC questioning, the V.C. Summer management directed their staff to perform an internal assessment in parallel with the NRC inspection activities to ascertain if the TR07800-009 was in fact a commitment in the FP licensing basis. Based upon licensee's internal review, they concluded the NRC's position was accurate in that the document was in fact a part of the V.C. Summer FP licensing basis and was required to be maintained consistent with the NFPA 805 Section 2.2.(j) and NFPA 805 Section 2.7. NFPA 805, Section 2.7, Program Documentation, Configuration Control, and Quality requirements required the licensee to ensure sufficient documentation was available, maintained, and easily retrievable.

Analysis: The licensee's failure to meet the quality requirements specified by NFPA 805 Section 2.2. (j) and NFPA 805, Section 2.7, Program Documentation, Configuration Control and Quality was a performance deficiency (PD). This PD was determined to be more than minor because it affected the regulatory process. In this instance, the licensee failed to ensure information to support the licensing commitments was controlled in the manner specified by the requirement. This information served as the basis for the NRC to perform its regulatory function and had the ability to impact the credited analysis relied upon to reach and maintain safe and stable conditions in case of a fire. As a result, the team evaluated the finding using traditional enforcement (TE) process based upon the guidance in NRC Enforcement Policy and NRC Enforcement Guidance. The team reviewed the NRC Enforcement Guidance, Part II, Section 2.2, "Actions Involving Fire Protection," to aid assessing the significance of the issue and determined the issue to be a SL IV.

No cross-cutting attributes are applicable for TE issues.

Enforcement: V.C. Summer Nuclear Station Unit 1, Renewed Facility Operating License Condition 2.C.18 required the licensee to implement and maintain in effect all provisions of the approved FPP that complied with 10 CFR 50.48 (c), "National Fire Protection Association Standard NFPA 805," as specified in the NRC safety evaluation report (SER) dated March 22, 2013. SAP-0131.10, "Fire Protection Program," required the license to ensure technical reports which were used to establish and implement the NFPA 805 Fire Protection Program requirements constituting the design basis be maintained. NFPA 805 Section 2.2.(j) stated that design requirements shall be ensured by maintaining adequate documentation and quality of analyses to maintain configuration control of the plant consistent with NFPA 805, Section 2.7. NFPA 805, Section 2.7 stated in that analyses performed to demonstrate compliance with this standard shall be documented and maintained for the life of the plant and be organized

carefully so that it can be checked for adequacy and accuracy either by an independent reviewer or by the AHJ. NFPA 805, Section 2.7.2.2, Supporting Documentation, stated that detailed supporting information shall be retrievable.

Contrary to the above, since February 11, 2015, the licensee has failed to ensure the requirements specified above. Specifically, the licensee's failure to meet the quality requirements specified by NFPA 805 Section 2.2. (j) and NFPA 805, Section 2.7, Program Documentation, Configuration Control and Quality was a performance deficiency (PD) because information to support the NFPA 805 licensing commitments was not controlled in the manner specified by the requirement. In addition, these technical reports and other information served as the basis for the NRC to perform its regulatory function and had the ability to impact the credited analysis relied upon to reach and maintain safe and stable conditions in case of a fire. The licensee initiated CR-16-05060, CR-16-05074, CR-16-05160, CR-16-05276, and CR-16-05278 to address the NRC concerns. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000395/2016010-01, "Failure to Meet the Quality Requirements Specified By NFPA 805.")

.07 Communications

a. Inspection Scope

The team reviewed plant communication capabilities to evaluate the availability of systems to support plant personnel in the performance of recovery actions to achieve and maintain NSCA, as credited in the VCSNS UFSAR, Section 9.5.2, "Communications." The team performed interviews and plant walkdowns with the licensee's operations staff to assess the credited method of communications used to complete operator actions as specified in post-fire procedures for the selected FAs. The team reviewed the adequacy of the communication system to support plant personnel in the performance of the fire brigade duties. The team reviewed and assessed the communication systems at various locations within the plant to ensure that when relied upon, functionality would exist to support fire event notification and fire brigade firefighting activities. The team also reviewed a committed ECR for this functional area as well as the Operability/Return to Service records associated with the NFPA 805 Emergency Communication Upgrade.

Additionally, a walk-down of the Fire Brigade Storage Room was conducted to verify the material condition status of the Fire Brigade's and the Operation's communication equipment. The inspectors reviewed preventive maintenance and surveillance test records to verify that the communication equipment was being properly maintained and tested. The team also verified that the design and location of communications equipment would not cause a loss of communications during a fire.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The team verified the adequacy of the plant's emergency lighting systems through review of design documents, maintenance aspects and inspection walk-downs of the fixed 8-hour battery pack emergency lighting units (ELUs) and MCR Emergency Lighting, as required by the VCSNS FPP. Specifically, the team reviewed the adequacy of the ELUs used to support plant personnel during post-fire safe shutdown for the selected FAs. The team performed plant walk-downs and observed the placement and coverage area of fixed battery pack emergency lights credited for NSCA, to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire NSCA. The team also reviewed samples of completed test records of ELU discharge tests. These completed surveillances, and preventive maintenance activities were performed to ensure batteries were sized, tested, rated for at least an 8-hour capacity and maintained consistent with vendor guidance, license requirements, and licensee commitments. The team reviewed the vendor manual to ensure that the ELUs were being maintained consistent with the manufacturer's recommendations, and verified the battery storage conditions and maintenance practices were also being followed in accordance with the vendor guidance. Specific documents reviewed by the team are listed in the Attachment.

b. Findings

No findings were identified.

.09 Cold Shutdown Repairs

a. Inspection Scope

The nuclear safety goal provided in NFPA 805 is to establish reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition. The licensee defines safe and stable conditions as maintaining reactor coolant temperature at or below hot standby conditions, or fuel coolant temperature less than boiling. The licensee does not require transitioning to cold shutdown to achieve the safe and stable condition, and therefore does not require cold shutdown repairs to be implemented.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection Scope

The team reviewed the fire impairment log to identify any out-of-service, degraded, or inoperable fire protection and success path equipment, systems, or features necessary to achieve and maintain safe and stable conditions. For any degraded features the team reviewed and ensured that adequate compensatory measures were in place based upon the impairment.

b. Findings

No findings were identified.

.11 Radiological Release

a. Inspection Scope

No radiological samples were reviewed

b. Findings

No findings were identified.

.12 Non Power Operations

a. Inspection Scope

No Non-power operations samples were reviewed

b. Findings

No findings were identified.

.13 Monitoring Program

a. Inspection Scope

The team reviewed VCNS procedure ES-0911, "NFPA 805 – Fire Protection Monitoring Program" Rev. 0, to ensure that the licensee established and maintained adequate monitoring of fire protection features. The team ensured that credited assumptions and features of the fire program were still valid. The team ensured that fire protection features were being maintained such that the availability and reliability of the systems and features were adequate in meeting the design basis.

b. Findings

No findings were identified.

.14 Plant Change Evaluation

a. Inspection Scope

The team reviewed the licensee's applicable procedures and processes to ensure the Plant Change Evaluations utilized an approach consistent with the NFPA 805 requirements. The team assessed the attributes of EC-10, "NFPA 805 Design Basis Maintenance," Rev. 0, EE-09, "NFPA 805 Circuit Selection, Circuit Analysis, and Circuit Routing," Rev. 0, and ES-0427, "Program/Issue Screening," Rev. 3 to gain insights on the measures licensee staff would take to ensure licensing basis commitments were satisfied. The team conducted interviews with licensee personnel and gained feedback on a current change that is being incorporated post, full-implementation period.

b. Findings

No findings were identified.

.15 Control of Combustibles and Ignition Sources

a. Inspection Scope

The team reviewed the applicable design calculation of each fire area to determine the adequacy of ignition source selection. The team verified that VCNS was using the appropriate ignition frequency for selected components based on NUREG/CR 6850, "Fire PRA Methodology for Nuclear Power Facilities," task 6. The team also reviewed any applicable frequently asked questions (FAQ's) for updated guidance on counting and including ignition sources. The team also reviewed the assumptions and modeling used to determine if each fire area would have developed a hot gas layer as a result of a fire. The list of specifics calculations reviewed is included in the Attachment.

b. Findings

Introduction: An NRC-identified Green NCV of 10 CRF 50.48(c) and NFPA 805 Section 2.4.3.2 was identified for the licensee's failure to address in their fire probabilistic safety analysis (also referred to as fire probabilistic risk assessment (PRA)) the risk contributions associated with all potentially risk-significant fire scenarios for a given FA/FZ.

Description: During review of calculation DC0780B-099, "Fire Modeling: Fire Area CB15," the team noted that the licensee excluded two electrical cabinets as ignition sources. The calculation stated, in part, that these two cabinets were considered to be well-sealed and robustly secured and, per NUREG/CR-6850, could be excluded as ignition sources and therefore had no credible fire scenarios. The team conducted an independent walkdown and assessment of the two cabinets and observed that cabinet XCP6231B appeared to have unsealed penetrations on the top of the cabinet. The inspectors requested the licensee to open the cabinet utilizing their configuration control process to verify if the penetrations were un-sealed. Prior to performing this task with the inspectors, the licensee examined the cabinet and provided photographs to the inspectors of the cabinet which noted that the penetrations were clearly un-sealed. The licensee acknowledged the oversight between the calculation and actual conditions and indicated that the original decision to include cabinet as well-sealed was based on an NRC FAQ that was ultimately not approved.

At the conclusion of the inspection, the licensee further determined that XCP6231A, an additional sealed cabinet, was not accounted for consistent with the requirements.

Analysis: The licensee's failure to include potentially high risk fire scenarios by incorrectly screening out electrical cabinets that were considered as well-sealed and/or excluded without adequate technical basis was a performance deficiency (PD). This PD was more than minor because it impacted the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to external events (i.e. fire) to prevent undesirable consequences. The finding was screened in accordance with NRC IMC 0609, "Significance Determination Process," dated April 29, 2015, Attachment 4, "Initial Characterization of Findings," dated October 7, 2016, which

determined that, an IMC 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, review was required because it affected the ability to reach and maintain safe and stable conditions in case of a fire. However, because the finding preliminarily had a delta core damage frequency $>1\text{E-}6$, a detailed risk analysis was required. The licensee performed an analysis of the performance deficiency using their fire probabilistic model and the results were that the performance deficiency (PD) represented a risk increase of $<1.0\text{E-}6/\text{year}$ in core damage frequency and $<1.0\text{E-}7/\text{year}$ in large early release fraction. The licensee's results were reviewed by a regional senior reactor analyst (SRA). Additionally, a bounding analysis was performed by the regional SRA in accordance with NRC IMC 0609 Appendix F which concluded that the core damage frequency risk increase due to the PD was $<1.0\text{E-}6/\text{year}$, a GREEN finding of very low safety significance.

The team assessed the issue consistent with IMC 0310, "Aspects Within Cross Cutting Areas," dated December 4, 2014, and determined the finding to have a cross-cutting aspect of Field Presence (H.2) in the Human Performance area because the licensee did not ensure that senior managers and supervisory staff maintained the proper amount of oversight of contractors and supplemental personnel in the performance work activities relevant to fire protection program implementation.

Enforcement: V.C. Summer Nuclear Station Unit 1, Renewed Facility Operating License Condition 2.C.18 required the licensee to implement and maintain in effect all provisions of the approved FPP that complied with 10 CFR 50.48 (c), "National Fire Protection Association Standard NFPA 805," as specified in the NRC safety evaluation report (SER) dated March 22, 2013. NFPA 805 Section 2.4.3.2 stated that the probabilistic safety assessment (Fire PRA) evaluation shall address the risk contribution associated with all potentially risk-significant fire scenarios.

Contrary to the above, since February 11, 2015, the licensee failed to address the risk contribution of all ignition sources associated with potentially risk significant fire scenarios during the initial fire scenario development resulting in potentially underestimating post-fire safe shutdown risk. Specifically, the licensee did not include cabinet XCP6231B or cabinet XCP6231A as an ignition source leading to a credible fire scenario in FA CB15. As a result, the impact to the applicable target cables was not postulated nor analyzed per the program requirements. The licensee has entered this into their corrective action program as CR-16-05287 and CR-16-05591. As a result, this violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000395/2016010-02, "Failure to Identify Ignition Sources During Initial Fire Scenario Development.")

.16 B.5.b Mitigating Strategy

a. Inspection Scope

The team reviewed on a sample basis, the licensee's preparedness to handle large fires or explosions by reviewing an applicable strategy which credited a portable supply mechanism (PDFP). The team verified the licensee's ability to meet the requirements of 10 CFR 50.54 (hh)(2) and their B.5.b related license conditions by reviewing procedures to ensure that they were being maintained and were adequate. The team performed walkdowns with licensee staff to ensure that credited actions, if any, the actions were

feasible. The team assessed if required equipment was properly staged. The team reviewed applicable records to determine if staff were properly trained.

The team also reviewed maintenance and testing records of equipment to ensure that the equipment was being maintained consistent with vendor recommendations and licensee requirements.

b. Findings

Introduction: The team identified a performance deficiency based upon the licensee's inability to meet the 50.54(hh) requirements. Specifically, the team identified inconsistencies between licensee calculations and actual equipment used to implement the mitigating strategy.

Description: The team conducted a walk down of the selected mitigating strategy used to meet the 10 CFR 50.54(hh) requirements. During the walk down, the team observed the licensee testing a component that was used for the selected strategy. It was noted that hardware for an applicable component needed for the strategy did not meet the design specifications required to successfully implement the credited strategy being assessed by the team. Specifically, the licensee did not install the correct hardware in accordance with their calculation assumptions credited for the mitigating strategy. When the team questioned the licensee about the discrepancy, they agreed that the hardware should meet the design specifications determined by the calculations. The licensee took immediate corrective actions and replaced the component to address the issue.

Analysis: The licensee's failure to ensure the operability of credited components needed to implement the mitigating strategy consistent with the stated commitments was a performance deficiency (PD). This PD was determined to be more than minor because of the adverse impact to the Mitigating Systems cornerstone objective. Specifically, the PD had the ability of impacting the availability and reliability of the credited strategy in response to conditions postulated to meet the 10 CFR 50.54(hh) requirements. The team screened the issue as Green using IMC 0612, Appendix B, "Issue Screening," and determined that further screening was necessary consistent with IMC 0612, Appendix L, "B.5.b Significance Determination Process," dated December 24, 2009. In this instance, the finding was determined to be of Green significance since no additional strategies were impacted.

No cross-cutting was assigned since this was not indicative of current performance. The licensee took immediate corrective actions to correct the issue.

Enforcement: V.C. Summer Nuclear Station Unit 1, Renewed Facility Operating License required the licensee to implement and maintain in effect all provisions of the 10 CFR 50.54hh requirements based upon submittals to NRC.

Contrary to the above, since at least December 2014, the applicable component identified by the team failed to meet the licensing basis commitments specified by 10 CFR 50.54(hh)(2) requirements. Specifically, since the licensee has failed to ensure the requirements specified above were adequately implemented there was reasonable assurance that the strategy would not have been successful had an actual event occurred. As a result, the licensee initiated CR-16-05266 to address this deficiency. This violation is being treated as an NCV consistent with Section 2.3.2 of the

Enforcement Policy. (NCV 05000395/2016010-03, "Failure to Meet the 50.54hh requirements.")

1R17 Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications

a. Inspection Scope

The team reviewed various engineering change requests (ECRs) credited with being completed to ensure the NFPA 805 program commitments were satisfied. The team conducted interviews of licensee personnel with responsibility of development or implementation of applicable ECRs to gain insights on package development and screening against the FPP requirements. The team performed walk downs of applicable areas of the plant based upon the completed modifications, to sample the implementation aspects. The team reviewed applicable drawings and procedures relevant to the facility changes to ascertain if changes were translated to applicable documentation and to assess the implementation after completion.

b. Findings

Introduction: An NRC identified SL IV, NCV of the 10 CFR 50.48(c), "NFPA 805," requirements was identified. Specifically, the team identified that the licensee made risk-informed changes but failed to seek or gain NRC approval for the changes made to the fire protection program during the post-safety evaluation issuance period date of February 11, 2015.

Description: The NRC issued to the VCSNS an amendment to its fire protection operating license on February 11, 2015. This change to the 2.C.18 license condition required that the licensee meet all attributes of the license based upon the stated commitments and included Transition License Condition 2.C.18.(c).1 which stated: "Before achieving full compliance with 10 CFR 50.48(c), ...risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact...". Per the commitments specified by Section 2.7.3 the licensee had requirements that were to be implemented by three specific periods. These times were 180 days after the February 11, 2015 date; December 31, 2015; and March 31, 2016.

In this example, the licensee failed to meet the commitments to support the December 31, 2015 date. Though the licensee provided a condition report the stating that modifications were not implemented consistent with commitments, the team determined after discussions that the basis for reaching this conclusion was based the use fire risk evaluations and other PRA tools. In some instances during the transition period, the licensee made a determination that committed modifications specified in correspondence to the NRC were not needed after the initial commitment date. This process was called into question by the team since the FREs were being updated at the time of the inspection. In addition, the licensee identified to inspectors that the PRA commitment was also not met, as documented in section 4OA7 of this report. Though the licensee documented the failure to meet the requirements, the result of missing the stated the modification commitments and making changes in the manner specified above constituted a de-facto change to the license. At the time of the inspection, the licensee had not recognized in SER Section 2.4.2, "License Conditions," that changes such as these constituted a risk-informed self-approval methodology.

In addition to the above items, on October 20, 2016 the licensee provided to the NRC team a condition report stating that additional modifications that were committed to in RC-11-0149 were also not implemented. The team viewed this as an additional instance of a change to the licensing basis and inconsistent with license condition. The licensee concluded that a license amendment request would be needed since the modifications have a more than minimal increase to plant risk. In these instances, the plant licensing basis and the as built plant condition needed to be the same and wasn't. As a result, these changes were deemed as one that had the potential to impede the regulatory process.

Analysis: The failure to seek or obtain approval to deviate from the stated requirements was a performance deficiency (PD). This PD was determined to be more than minor because it impacted the regulatory process. Specifically, the team determined that the licensee made changes which were inconsistent to commitments specified by the 2.C.18(c).1 license condition. This license condition was based upon docketed correspondence from the licensee to the NRC which established the basis for fire protection program implementation. As a result of the deviations, the licensee made a self-approved risk-informed change prior to full-implementation inconsistent from the requirements of the license. This formed the basis for the team to evaluate the finding using traditional enforcement (TE) based upon the guidance in NRC Enforcement Policy. The team reviewed NRC Enforcement Guidance, Part II, Section 2.2, Actions Involving Fire Protection, to assess the significance of the issue and determined the issue to be a SL IV.

No cross-cutting aspects are applicable to TE violations.

Enforcement: V.C. Summer Nuclear Station Unit 1, Renewed Facility Operating License Condition 2.C.18 required the licensee to implement and maintain in effect all provisions of the approved FPP that complied with 10 CFR 50.48 (c), "National Fire Protection Association Standard NFPA 805," as specified in the NRC safety evaluation report (SER) dated February 11, 2015. RG 1.189, "Fire Protection for Nuclear Power Plants," Rev. 2 defines the licensing basis as the set of NRC requirements applicable to a specific plant based on the commitments made via a docketed process. SAP-0131.10, Fire Protection Program, required the licensee to ensure the design basis be maintained for effective fire protection program implementation.

Contrary to the above, since December 31, 2015 the licensee has failed to ensure the requirements specified above. The licensee's failure to obtain NRC approval prior to making any changes that had a more than minimal increase to the 2.C.18 license requirements was a performance deficiency (PD). This PD was determined to be more than minor because the team determined that risk-informed changes made to a commitment specified by license condition 2.C.18(c).1, which was based upon docketed correspondence from the licensee, required NRC approval. This lack of recognition was from weaknesses in a translation of licensee commitments specified by the NRC to a validated process. In addition, changes to the FRES and PRA model were ongoing and relevant to this issue since this formed the basis for the decision-making. The licensee initiated CR-16-01490 and CR-16-05291 to address the issue. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000395/2016010-04, "Failure to seek or gain approval for risk-informed changes constituted a self-approved change which is inconsistent with the NFPA 805 requirements.")

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution

a. Inspection Scope

The team reviewed recent independent licensee audits for thoroughness, completeness and conformance to FPP requirements. Guidance for the independent audits are contained in Regulatory Guide 1.189, "Fire Protection for Operating Nuclear Power Plants," and Generic Letter 82-21, "Technical Specifications for Fire Protection Audits." The team also reviewed other CAP documents, including completed elective actions and corrective actions documented in selected CRs and operating experience program documents, to ascertain whether industry identified fire protection issues (actual or potential) affecting V.C. Summer Unit 1 were appropriately entered into the CAP for resolution. Items included in the operating experience program effectiveness review were NRC information notices, regulatory guides, regulatory issues summary, industry or vendor generated reports of defects and non-compliances submitted pursuant to 10 CFR Part 21, and vendor information letters. The team assessed the licensee's ability to identify issues related to the FPP and FAs selected at an appropriate threshold, appropriately classifying these issues per their site administrative procedures and entering these issues into the corrective action program consistent with as required by NFPA 805 section 2.6. The team reviewed licensing basis documentation such as 10 CFR 50.48(a), 10 CFR 50.48(c), NFPA 805, 2001 Edition, licensing submittals, LAR, and the NRC NFPA 805 Safety Evaluation Report (SER) to verify that corrective actions met the licensing commitments. The team reviewed Safety Evaluation (SE) report section 3.7 (NFPA 805 Monitoring), which states "if the established levels of availability, reliability or performance are not met, appropriate corrective actions to return to the established levels shall be implemented. Monitoring shall be continued to ensure that the corrective actions are effective."

b. Findings

Introduction: An NRC-identified Green NCV of V.C. Summer Nuclear Station Unit 1 Renewed Facility Operating License Condition 2.C.18 and NFPA 805 was identified for the licensee's failure to adequately classify and correct conditions adverse to quality in a timely manner. Specifically, NFPA 805 Section 2.6.3, Corrective actions, stated that if the established levels of availability, reliability, or performance are not met, appropriate corrective actions to return to the established levels shall be implemented.

Description: The team selected a sample of NFPA 805 items specified as being open as documented in the licensee's corrective action program. The goal was to verify that the appropriate corrective actions to return deficiencies to the established levels were implemented, to verify that the corrective actions were commensurate with the significance of the issue and to verify if the corrective actions were implemented by the licensee. The team reviewed USNRC letter to SCE&G (docket No. 50-395, dated July 26, 2012) which requested the licensee provide additional information (RAI) as described in NSCA RAI 14. The request stated, in part, "Describe whether the 13 open items in Appendix C, Circuit Analysis Opens Table of "NFPA 805 and Fire PRA Circuit Analysis, Task 4.4" TR07800-009, have been entered into the CAP and whether they have been completed". The SCE&G response, contained in (RC-12-0142, dated October 10, 2012) stated that the 13 open items in Appendix C, Circuit Analysis Open

Table have been addressed acceptably and are considered closed. Within proximity to this statement, a reference to CR-12-02306 was specified by the licensee.

The team reviewed site administrative procedure SAP-0131, "Fire Protection Program," Rev. 10, section 1.1 which stated "the purpose of this procedure is to define the V. C Summer Nuclear Station (VCSNS) Unit 1 Nuclear Exclusion area fire protection program (FPP) identified in section 3.16.E the administrative procedure SAP-0999 "Corrective Action Program."

The team reviewed procedure SAP-0999, section 4.1.1.A which stated "Corrective actions are actions that have or will be taken to correct a deficient or degraded condition. Within the context of the SAP-0999 procedure, the licensee specified several action levels which are used to ensure timely and adequate corrective action of the respective issue. In this instance, the 2012 CR initiated by the licensee per the licensee was designated with an Action level 3, which is considered and elective action. According to SAP-0999, Section 4.1.1.B of the procedure, elective actions are actions that correct minor degradation to SSCs or related processes. This action level is not identified as one associated with CAQs. In this instance, by defining the corrective action to address the open items, which was questioned as a result of the transition to NFPA 805, as an Action level of 3 the team concluded the licensee did not consider this to be a condition adverse to quality or a degraded condition that could impact the FPP commitments. This was based upon further review by the team of procedure SAP-0999, Enclosure B. The following annotates the basis of applicable action levels:

- Action level 3 - routine actions (RA), also considered elective actions, are actions that do not directly address the correction of a CAQ or the identified cause;
- Action level 4 - tracking actions are Actions that are used to track items such as Actions items from meetings... They may or may not get implemented; and
- Action Level 5 – Long-Term Corrective Actions (LTCA), these items are long term actions (equal to or greater than 365 days that are considered Corrective actions. These require implementation through plant change process.

The team reviewed SAP-0999, Enclosure A, which stated that Category 3 CRs are categorized as a non-Condition Adverse to quality. As a result of identifying this as an "elective action," the team determined that the underlying was not recognized as a condition adverse to quality (CAQ) or meet the intent of timeliness consistent with NFPA 805, Section 2.6.3.

To support the timeliness assertions, the team observed that licensee documentation stated that the actions to address open items specified in TR07800-009 were entered into the corrective action program as CR-12-02306, with an anticipated completion date for Action 1 and 2 the first quarter of 2013. The team observed that CR-12-02306 had a creation date of 06/05/12 and was given Category 3 assignment. In addition, action items 001 and 002, which were focused on correcting the Open items, were categorized as a Level 4. Both of the Action levels were changed from 4 to 3 per the Corrective Report Review team (CRRT) on 10/9/14. At the time of the inspection, the team noted the last updates for Actions 001 and 002 were entered on 10/04/16 which stated, "This item is or mostly complete – separate items being reviewed" and "most if not all of these items may be complete, reviewing several separate documents." Based upon these observations this is an additional instance where the licensee failed to identify the issue adequately.

Analysis: The licensee's failure to ensure the implementation of corrective actions were implemented consistent with the NFPA 805, Section 2.6.3 was a PD. The PD was more than minor because, if left uncorrected, it could lead to more significant safety concern. Specifically, the inadequate application of the corrective action program can lead to deficiencies degrading SSCs which can adversely impact the FPP requirements. The finding was screened in accordance with IMC 0612, Appendix B and IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings" worksheet. A determination was made using IMC 0609, "Significance Determination Process," dated June 2, 2011. Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012 was applicable since the administrative controls in this instance were not associated with transient or hot work activities. Using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance (Green) because it did not represent an actual loss of safety function.

The team assessed the finding against the IMC 0310, "Cross-cutting Aspects," requirements and determined that cross-cutting was applicable. In this instance, the cause of this finding was determined by the team to have a cross-cutting aspect of the Resolution component (P.3) of the Problem Identification and Resolution (PI&R) area. This was selected based upon the inability organization to adequately identify and take effective corrective actions to address issues in a timely manner commensurate administrative procedures to meet the NFPA 805, Section 2.6.3 requirements.

Enforcement: V.C. Summer Nuclear Station, Unit 1 Renewed Facility Operating License Condition 2.C.18 required the licensee to implement and maintain in effect all provisions of the approved FPP that complied with 10 CFR 50.48 (c), "National Fire Protection Association Standard NFPA 805." The NRC safety evaluation report (SER) dated February 11, 2015 relied upon an adequate corrective action program to implement the NFPA 805 requirements. SAP-0999, "Corrective Action Program," stated in part that the licensee would adequately identify, evaluate, and verify resolution of conditions that are adverse or potentially adverse to quality. SAP-0131, "Fire Protection Program," Rev 10 references the SAP-0999 procedure as being applicable for implementation of the FPP requirements adequately. NFPA 805 Section 2.6.3, Corrective actions, stated that if the established levels of availability, reliability, or performance are not met, appropriate corrective actions to return to the established levels shall be implemented.

Contrary to the above, since February 11, 2015 the licensee failed to adequately meet the corrective action program requirements by failing to properly assign an action level commensurate to issue could lead to more significant safety concern. Specifically, the failure to ensure that actions are annotated accurately and appropriate corrective actions are implemented is the fundamental basis for meeting the established standards by the NRC as recognized by NSCA RAI 14. The lack of an adequate designation also calls into question the effectiveness of the program to correct issues and if they were actually corrected per NFPA 805, Section 2.6.3 and closed as stated in a timely manner. Because the finding was of very low safety significance (Green) and was entered into the licensee's CAP as CR-16-05306 and CR-16-05160, Action 1, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. This violation is identified as 05000395/2016010-05, ("Failure to meet corrective action requirements consistent with NFPA 805 Section 2.6.3.") Specific documents reviewed by the team are listed in the Attachment.

4OA6 Meetings, Including Exit

On October 21, 2016, the inspection team leader presented the preliminary inspection results to Mr. G. Lippard and other members of the licensee's staff. The licensee acknowledged the results. The team had further communications with the licensee and headquarters personnel after the exit date which resulted in a re-exit on December 1, 2016. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation.

- .1 The licensee identified an example of a failure to meet the 2.C.18 commitments. The licensee was required to implement applicable aspects of the NFPA 805 requirements in order to achieve the risk reductions specified in RG 1.174, "An Approach for Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." To accomplish this, the licensee committed to various changes to the facility. In this instance, the licensee committed to ensure the PRA developed to meet the 2.C.18 requirements was completed consistent with Table S-2, Implementation Item 22 and SER Section 2.7.2.

Contrary to the above, the licensee failed to implement the stated requirement specified by license condition 2.C.18 and docketed correspondence from the licensee to the NRC. Specifically, the licensee deviated from the stated commitment without NRC approval by which formed the basis for the team to evaluate the finding using traditional enforcement (TE) based upon the guidance in NRC Enforcement Policy. The team reviewed the NRC Enforcement Guidance, Part II, Section 2.2, "Actions Involving Fire Protection," to aid assessing the significance of the issue and determined the issue to be a SL IV.

A cross cutting aspect was not assigned based upon the TE determination.

Based upon the identification by the licensee, the issues have been entered into the licensee's corrective action program as CR-16-00321, CR-16-01132, CR-16-01602, CR-16-04828, and CR-16-04829.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Bennett, Licensing Engineer, Nuclear Licensing
C. Calvert, Manager, Design Engineering
G. Douglass, Manager, Nuclear Protection Services
D. Edwards, Supervisor, Operations
J. Garza, Supervisor, Nuclear Licensing
T. Gatlin, Vice President, Nuclear Support Services
J. Gathers, Design Engineering
B. Gerwe, Contractor, Jensen-Hughes
L. Harris, Manager, Quality Systems
R. Haselden, General Manager, Organizational / Development Effectiveness
R. Justice, General Manager, Nuclear Plant Operations
L. Kachnik, Probability & Risk Assessment
M. Kammer, Manager, Emergency Response
G. Lippard, Vice President, Nuclear Plant Operations
G. Loignon, Supervisor, Probability and Risk Assessment
T. Lontz, Contractor, Jensen-Hughes
D. Mauldin, Design Engineering
M. Moore, Supervisor, Nuclear Licensing
R. Ray, Manager, Maintenance
R. Perry, Licensing Engineer, Nuclear Licensing
D. Shue, Manager, Nuclear Operations
W. Stuart, General Manager, Engineering Services
W. Taylor, Nuclear Licensing Engineer
B. Thompson, Manager, Nuclear Licensing
M. Torres, Operations
D. Weir, Manager, Plant Support Engineering
R. Williamson, Manager, Emergency Services
S. Zarandi, General Manager, Nuclear Support Services

NRC Personnel

J. Reece, Senior Resident Inspector, V.C. Summer Resident Office
E. Coffman, Resident Inspector, V.C. Summer Resident Office
H. Barrett, Senior Fire Protection NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000395/2016010-01	SL IV	Failure to Meet the Quality Requirements Specified By NFPA 805 (Section 1RO5.06)
05000395/2016010-02	NCV	Failure to identify unsealed cabinet Specified by NFPA 805 Section 3.3.1.2(1) (Section 1RO5.15)
05000395/2016010-03	NCV	Failure to ensure credited equipment to support the 50 54hh requirements were adequate (Section 1RO5.16)
05000395/2016010-04	SL IV	Failure to seek or gain approval for risk-informed changes constituted a self-approved change which is inconsistent with the NFPA 805 requirements (Section 1R17)
05000395/2016010-05	NCV	Failure to meet corrective action requirements consistent with NFPA 805 Section 2.6.3) (Section 4OA2)

SUPPLEMENTAL INFORMATION

Section 1R05.06: List of NSCA Components Inspected

<u>Component Identification</u>	<u>Description</u>
INI00033	Source Range Instrumentation
MVG-8000B Relief	PORV
CP – A	Charging Pump A
IFV-3556-EF	TDEFP Valve
XFER FCV-122	Charging Flow Control Valve
XFER LCV-459	Steam Valve to TDEFP
Circuit RCC42A	Cable
Circuit RCC44A	Cable

LIST OF DOCUMENTS REVIEWED

Licensing, Codes and Standards

Docket No. 50-395, LAR-06-00055, RC-12-0142, License Amendment Request,
Docket No. 50-395, LAR-06-00055, RC-13-0166, License No. NPF-12, Attachment 1,
Probabilistic Risk Assessment (PRA) Request for Additional Information (RAI) Responses
FAQ Number 07-0035, Bus Duct Counting Guidance for High Energy Arcing Faults, Rev. 2
LAR-06-0055, RC-13-0166, Docket No. 50-395, Virgil C. Summer Nuclear Station, Unit 1,
Operating License No. NPF-12, Attachment 1, Probabilistic Risk Assessment (PRA),
Request for Additional Information (RAI) responses
NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric
Generating Plant, 2001 Edition
NFPA 1962, Standard for the Inspection, Care and Use of Fire hose, Couplings, and
Nozzles and the Service Testing of Fire Hose, 2003 Edition
TR07800-008, Engineering Services Technical Report, Non-Power Operational Modes
Transition Review and Table F-1, Rev. 0
TR07800-009, Engineering Services Technical Report, NFPA 805 and Fire PRA Circuit Analysis
Report, Task 4.4, Rev. 0
TR08620-014, Engineering Services Technical Report, Nuclear Safety Performance Criteria
Review Transition, Rev. 2
TR08620-015, Nuclear Safety Equipment Report, Rev. 0
TR08620-036, NFPA 805 Recovery Actions, Feasibility/Reliability Study, Rev. 0
V.C. Summer Cable and Raceway (CB) Design Basis Document, Rev. 2
V.C. Summer Engineering Services Technical Report TR0780E-001, Fire Protection
Equivalency Evaluations, Rev. 0
V.C. Summer Engineering Services Technical Report TR07800-033, Fire Safety Analysis
V.C. Summer NFPA 805 Design Basis Document, "Fire Protection System," Rev. 0
V.C. Summer Nuclear Station Design Basis Document, "Fire Protection System," Rev. 2
V.C. Summer Nuclear Station Fire Protection Evaluation Report, 3/29/2016
V.C. Summer Nuclear Station, Unit 1 – Issuance of Amendment Regarding transition to a
Risk-Informed, performance-Based Fire Protection Program in Accordance with 10 CFR
50.48(c)(TAC no. ME7586, dated 2/11/2015

V.C. Summer Nuclear Station Unit 1, Quality Assurance Program Description, Rev. 0
 Report, Rev. 0
 V.C. Summer Fire PRA Plant Final Report Task 5.16, Rev. 0
 V.C. Summer Fire Risk Evaluation Report 0043-0001-005-00, Rev. 0
 0043-0001-005-00, V.C. Summer Fire Risk Evaluation Report, Hughes Associates, Rev. 0

Calculations

BDMG-5.0, Manually Depressurize SGS and Use Low Pressure Water Sources, Rev. 2
 DC0780B-001, Fire Modeling Generic Methodology, Rev. 6
 DC0780B-099, Fire Modeling-Fire Area CB-15, Rev. 3
 DC0780B-186, Fire Modeling: Fire Zone IB22.02, Rev. 2
 DC0780D-002, NFPA Code Compliance Document, Rev. 0
 DC0780D-003, NFPA Code Conformance Calculation, NFPA12-1973, NFPA 13-1973, NFPA 13-1975, NFPA 13-1980, NFPA 20-1974 & NFPA 24-1973, Rev. 0
 DC0780D-004, NFPA Code Conformance Calculation, NFPA10-1973 & NFPA 14-1974, Rev. 0
 DC0780D-005, NFPA Code Conformance Calculation, NFPA72-1980, NFPA 72E-1978 & NFPA 76-2009, Rev. 0
 DC0780D-006, NFPA Code Conformance Calculation, NFPA30-1973, NFPA 50A-1973, NFPA 241-2000, NFPA 55-2000, NFPA 256-1998 & NFPA 701-1999, Rev. 0
 DC0780D-007, NFPA Code Conformance Calculation, NFPA80-1973, NFPA 90A-1973 & NFPA 220-1975 & NFPA 251-1999, Rev. 0
 DC07810-015, Intermediate Building 412' & 436' Sprinkler System Hydraulic Analysis, Rev. 4
 DC07810-030, Control Building Pre-Action Sprinkler System, Rev. 1
 DC07810-033, Evaluation of the Fire System Flooding Effects Outside the Reactor Bldg., Rev. 0
 DC08040-012, Protective Devices Coordination, Rev. 4
 DC08220-012, XSW1DX Unit 2 and XSW1DX Unit 5 Electronic Relay Settings (Schweitzer Relays – 351S), Rev. 0
 TR07870-002, Penetration Seal Engineering Evaluations, Rev.2
 TR07870-019, Penetration Seal Design Guide, Rev. 0

Completed Surveillance Test, Work Orders, Changes

Work Order, step 1315838-004, Inspect Fire Barrier EAB4363
 WO1200854, STP0128.021-FS-2, Fire Service Loop Flow Test, 8/13/2012
 WO1312734, CMP700.011, IB Hose Station Valve Flow Check and Flush, 6/13/2014
 WO1415087, STP0128.021-FS-2, Fire Service Loop Flow Test, 7/16/2015
 WO1502101, CMP700.011, IB Hose Station Valve Flow Check and Flush, 7/28/2015
 WO1503808, STP 0128.022-FS, FPER Fire System Visual Inspection, 6/29/2015
 WO1508549, STP 0128.002-FS, Valve Line-up Verification, 2/04/2016
 WO1508848, PTP-114.045, Sprinkler System Strainer Flush, 2/08/2016
 WO1508848, PTP-114.045, Sprinkler System Strainer Flush, 2/08/2016
 WO1509923, PTP-114.040, CB Pre-action Sprinkler System Flow Test, 9/01/2016
 WO1513466, STP 0128.003-FS-2, Fire System Valve Cycle, 5/31/2016
 WO1513472, STP 0128.305, CB Pre-action Sprinkler System Functional Test, 6/08/2016
 WO1514979, CMP 0100.008, SR Door Inspection and Lubrication, 5/10/2016
 WO1600436, PMT SR3, Inventory, Inspect and perform PM of Fire Brigade Locker and Equipment, 6/13/2016
 WO1600911, STP170.001, Electric Fire Pump Monthly Test, 7/05/2016
 WO1605873, STP 0128.019-FS, Semi-annual Fire Door Inspection, 7/05/2016
 WO16010174, STP228.001, Fire Protection System Diesel Fire Pump Test, 5/17/2016

WO1601739, PTP-114.002, NFPA 805 Required Fire Extinguisher Inspection, 6/30/2016
 WO1602039, CMP 0100.008, SR Door Inspection and Lubrication, 7/08/2016
 WO1605936, STP 0128.009-FS, Fire Hose Station Inspection, 6/06/2016
 WO1607365, PTP 015, Fire Door Inspection, 6/01/2016
 WO1606898, STP 0128.319, Smoke Detector Functional Test, 8/09/2016
 WO1606924, STP0428.064H-XAH0007A, HVAC System Fire Damper Inspection, 10/5/2016
 WO1608091, STP170.001, Electric Fire Pump Monthly Test, 7/24/2016
 WO1608092, STP 170.002, Diesel Fire Pump Monthly Test, 7/24/2016

Corrective Action Documents (CRs) Reviewed During This Inspection

CR-07-02338, Fire Damper Closure by Fire Brigade
 CR-08-04798, Fire Damper Closure Under Air Flow
 CR-11-03925, complete NFPA 805-2001 Implementation actions associated with a variety of administrative, programmatic requirements defined in the gap analysis documented in DC0780E-002 (NFPA805 Chapter 3) and other related chapters of NFPA805.
 CR-12-02306, during a review of an NRC question on NFPA 805 Technical Report TR07800-009, it was discovered that the Open Items Table in Appendix C had not been addressed in the report prior to issue
 CR-16-01490, ECR50810 & ECR50784 were de-scoped inconsistent with NFPA 805 Requirements
 CR-16-01602, Calculated delta risk and compliant risk not compliant per RG 1.174

Corrective Action Documents Generated because of this Inspection

CR-16-05045, Original GL 86-10 engineering evaluation removed from Technical Report 07870-002
 CR-16-05152, Modification to 7.2kv safeguards power system not translated to licensee training material
 CR-16-05160, NRC questioned the validity of TR07800-009 as part of the NFPA 805 licensing basis
 CR-16-05244, No condition reported generated to address Fire PRA fault discussed in RAI 66 to support NFPA 805, LAR
 CR-16-05257, AOP 900 procedures were inconsistent with committed analysis
 CR-16-05266, B.5.b strategy equipment found during walkdown
 CR-16-05271, No procedure to verify infrequently operated manual isolation valves
 CR-16-05272, Ignition sources identified in TB03 that was inconsistent with fire modeling calculation
 CR-16-05274,
 CR-16-05276, Licensee self-assessment validated inconsistencies in the updating of technical reports based upon NRC fire protection team questioning
 CR-16-05277, Questions regarding the validity of ES-427 as it is used to implement program requirements
 CR-16-05278, FSA database and impacts to fire protection program requirements
 CR-16-05283, Adequacy of signage to support mitigating strategy implementation
 CR-16-05291, Modification commitments per LAR-11-0149 not completed

Audits & Self-Assessments

SA14-DE-03S – NFPA 805 Safety Evaluation Readiness Review, Rev. 1
 SA16-DE-01 – Triennial Fire Protection preparation

Fire Pre-plans and Fire Brigade Training Records Reviewed

FP1-CB-448', Control Building, Rev. 0
 FP1-IB-436', Intermediate Building, Rev. 0
 FP1-TB-436', Turbine Building, Rev. 0
 Fire Brigade Leader Qualification Report, 9/09/2016
 Fire Brigade Member Qualification Report, 9/09/2016
 Fire Brigade Drill Mgmt. Observation Report (Drills from 1/14/2015 to 8/27/2016), 10/05/2016
 Memorandum of Understanding, V.C. Summer Nuclear Station and Jenkinsville-Monticello-Horeb Volunteer Fire Department, June 20, 2014
 Fire Brigade Drill Report, Backshift and Unannounced, 4/20/2016
 Fire Brigade Drill Report, Annual Refresher Training for State and Local Agencies, 5/16/2015
 Fire Brigade Drill Report, Failed Drill, 12/22/2015
 Fire Brigade Drill Report, NRC TFPI Observed Drill, 10/05/2016

Procedures

Appendix A, Abnormal Operating Procedure, Operational Impacts of Loss of electrical Buses Due to Fire, Rev. 0
 AOP-900, Appendix A, Operational Impacts of Loss of Electrical Buses Due To Fire, Rev. 0
 AOP-900.02, Control Room Evacuation Due To Fire, Rev. 0
 AOP-900.05, Abnormal Operating Procedure, Intermediate Building Fire Zone Response Actions, Rev. 0
 CMP 0100.008, SR Door Inspection and Lubrication, Rev. 8, Change B
 CMP 700.011, IB Hose Station Valve Flow Check and Flush, Rev 5, Change A
 EC-10, Design Engineering Guideline, NFPA 808 Design Basis Maintenance, Rev. 0
 EE-09, Design Engineering Guideline, NFPA 805 Circuit Selection, Circuit Analysis, and circuit Routing, Rev. 0
 EMP-300.005 Cleaning and Inspection of Electrical Equipment, Rev.9 Change A
 EPP-013, Emergency Plan Procedure Fire Emergency, Rev. 19
 EPP 107, Conduct of Fire Brigade Drills, Rev. 1
 ERMP-100.005, FX Pumper Truck Preventative Maintenance, Rev. 0
 ES-0110, Engineering Services Procedure, Review and Verification of Controlled Documents, Rev. 3
 ES-0427, Engineering Services Procedure, Program Issue Screening, Rev. 3
 ES-0412, Engineering Services Procedure, Initiation and Control of Design Calculations, Rev. 5
 ES-101, Engineering Services Procedure, ES Controlled Document Development, Rev. 17
 FPP 015, Shift Inspection, Rev 7
 FPP 020, Program Administration, Rev. 6
 FPP 022, Fire Prevention, Rev. 4
 FPP 025, Fire Containment, Rev. 6
 GS-2, Operations Training, General Systems, Safeguards Power, Rev. 262
 PTP 114.002, NFPA 805 Required Fire Extinguisher Inspection, Rev 18
 PTP 114.040, CB Pre-action Sprinkler System Flow Test, Rev. 7
 PTP 114.045, Sprinkler System Strainer Flush, Rev. 1
 SAP-123, Station Administrative Procedure, Procedure Use and Adherence, Rev. 6
 SAP 0131, Fire Protection Program, Rev. 10
 SAP 0131A, Fire Protection Program Surveillances and Compensatory Measures, Rev. 3
 SAP-0999, Corrective Action Program, Rev. 12
 STP 0128.002-FS, Valve Line-up Verification, Rev. 18

STP 0128.003-FS-2, Fire System Valve Cycle, Rev 17
 STP 0128.009-FS, Fire Hose Station Inspection, Rev. 10
 STP 0128.019-FS, Semi-annual Fire Door Inspection, Rev. 8
 STP 0128.021-FS, Water Flow Test, Rev. 11
 STP 0128.022-FS, FPER Fire System Visual Inspection, Rev. 8
 STP 0128.305, CB Pre-action Sprinkler System Functional Test, Rev. 13
 STP 0128.319, Smoke Detector Functional Test, Rev. 6
 STP 170.001, Electric Fire Pump Monthly Test, Rev. 4
 STP 170.002, Diesel Fire Pump Monthly Test, Rev. 6
 STP 228.001, Fire Protection System Fire Pump Test, Rev. 6
 STP 428.064, HVAC System Fire Damper Inspection, Rev. 4, Change B
 STP-502.009, Surveillance Test Procedure, 7.2 KV Breaker Protective Relay Test, Rev. 4
 STP-508.003, Molded Case Circuit Breaker Testing For Cable Over-Current Protection, Rev.12, Change C
 STP-508.004, Surveillance Test Procedure, 7.2 KV Breaker Protective Relay Testing, Rev. 4
 STP-728.033, Turbine Building Fire Barrier Inspection, Rev. 5, Change E
 STP 728.043, Control Building Elevation 448' Fire Barrier Inspection, Rev. 5, Change C
 STP 728.048, Control Building Elevation 436' Fire Barrier Inspection, Rev. 4, Change E
 VCS TPQ-0606, Fire Protection Training, Rev. 0

Technical Manuals and Vendor Information

Modifications

ECR 50784, NFPA 805 Circuit / Tubing Protection, Rev. 0
 ECR 50800, NFPA 805 New 7.2kV feeder to XSW1DA, Rev. 0
 ECR 50810A, Hazards Protection for NFPA 805 Transition, dated 6/30/15
 ECR 50811, Implementation NFPA 805 Incipient Detection, Rev. 0
 ECR 50856, NFPA 805 Emergency Communication Upgrade, dated 9/24/13
 ECR 50856B, SAP-0133, NFPA 805 Emergency Communication Upgrade, plant modification package, System Attachment VIII, Operability/Return to Service, Phase 1, 2, 3,4, Installation and testing of the, 12/22/15.
 ECR 50874, NFPA 805 General Screening, Reactor Building Cooling Upgrade, 5/19/2016
 ECR 71225, Add Main Control Board Trunk Cables into PC-CKS for NFPA 805 Safe Shutdown Analysis, Rev. A, B, C, D

Drawings

B-023-303, Sht. 1, Penetration Seal Typical Designs, Wall and Floor Details, Rev. 0
 B-208-032 EF SH. 39A, Electrical - Elementary Diagram EF Isolation from Turbine Driven Pump to Steam Gen "C" IFV-3556, Rev. 14
 B-208-032 EF Sh. 39B, Electrical - Elementary Diagram EF Isolation from Turbine Driven Pump to Steam Gen "C" IFV-3556, Rev. 13
 B-208-082RC Sh 11, Elementary Diagram Pressurizer Relief Isolation Valve (XVG 8000B), Rev. 8
 B-208-032, Diesel Bus Undervoltage Signal, Rev. 5
 B-208-032, Turbine Driven EFW Pump Service Water, Rev. 8
 B-208-032 EF Sh. 36A, "Elementary Diagram EF Isolation from Mot. Driven Pump to Steam Gen "C" IFV-3551", Rev. 11
 B-208-021, Elementary Diagram Letdown Isolation VV. LCV-459, Rev. 1

E-206-080, One-line diagram 125 V DC Disconnect Switch Power Feeds for Appendix R Valves, Rev. 2

D-302-085, Piping System Flow Diagram Emergency Feedwater (Nuclear), Rev. 50

D-302-271, Piping System Flow Diagram Instrument Air, Rev. 42

D-302-274, Piping System Flow Diagram Instrument Air Backup, Rev. 13

D-302-601, Piping System Flow Diagram Reactor Coolant, Rev. 19

D-302-602, Piping System Flow Diagram Reactor Coolant System, Rev. 30

D-302-671, Piping System Flow Diagram Chemical and Volume Control, Rev. 11

D-302-672, Piping System Flow Diagram Chemical and Volume Control, Rev. 13

D-302-673, Piping System Flow Diagram Chemical and Volume Control, Rev. 19

D-302-674, Piping System Flow Diagram Chemical and Volume Control, Rev. 13

D-302-675, Piping System Flow Diagram Chemical and Volume Control, Rev. 36

D-302-676, Piping System Flow Diagram Chemical and Volume Control, Rev. 14

D-302-691, Piping System Flow Diagram Safety Injection, Rev. 16

D-302-693, Piping System Flow Diagram Safety Injection, Rev. 22

B-318-010, Sh. 4, Plant Layout Ionization & Heat Detectors, IB & DG Building El. 436'-0", Rev. 8

B-318-010, Sh. 8, Plant Layout Ionization & Heat Detectors, Cable Spreading Rooms and Roof Plans, El. 425'-0", 448'-0" & 525'-0", Rev. 4

IMS-55-085, Sh.12, Cable Spreading Room Pre-Action Sprinkler System, El. 448'-0", Rev. 7

CMP – 200.006, Core Drilling, Rev. 9

CMP – 700.009, Quality Related Pressure Barrier/Components Inspections, Rev. 6

D-105-012, Control Building Floor Plans at El. 425'-0", 448'-0", & 482'-0", Rev.29

D-302-001, System Flow Diagrams-Diagram Symbols, Rev.30

D-302-002, Flow Diagram Legend, Rev. 12

D-302-083, "Piping System Flow Diagram Feedwater (Nuclear)", Rev. 54

D-302-231, Sh. 1, System Flow Diagrams, Fire Service Pumps, Rev. 37

D-302-231, Sh. 2, System Flow Diagrams, Fire Service Hydrants & Loop, Rev. 18

D-302-231, Sh. 3, System Flow Diagrams, Fire Service RB, AB, IB, DG, FH, & CB, Rev. 11

D-302-231, Sh. 5, System Flow Diagrams, Fire Service Valve Manifolds, Rev. 9

D-912-159, System Flow Diagram, Turbine Building, Switchgear Rooms-Cooling, Rev. 8

ES-0450, NFPA 805 Digital Radio Communications within Fire Area Test, 7/2014

EMP-300.009, Cable Pulling, Rev. 8

EMP-405.003, Termination and de-Termination of Cables 480 Volts and Below, Rev. 17

E-022-029, Emergency Lighting Intermediate Building, Rev. 0

E-022-026, Emergency Lighting Turbine Building, Rev. 0

E-022-032, Emergency Lighting Control Building, Rev. 0

E-022-026, Emergency Lighting, Turbine Building, Floor Plan El. 436'-0", Rev. 0

E-022-029, Emergency Lighting, Inter. Bldg., East PA & DSL. Bldg. EL. 436", Rev. 0

E-022-032, Emergency Lighting, Control Building, Elevation 425'-0" and 448'-0", Rev. 1

E-023-062, NFPA 805 Boundaries, Intermediate and Diesel Generator Buildings, Rev. 0

E-023-062, NFPA805 Analysis Boundaries, Intermediate & Diesel Generator Bldg - Plan – El. 436'-0", Rev. 0

E-023-071, NFPA805 Analysis Boundaries, Cable Tray Spreading Rooms and Roof, Plans – El. 425'-0" and 565'-0", Rev. 0

E-023-074, NFPA805 Analysis Boundaries, Turbine Building, Plans Elevations 436'-0", Rev. 0

E-206-062, Engineered Safety Features Vital AC Sys., Rev. 40

E-206-005, Plant Electrical Distribution, Rev. 29

E-210-024, "Electrical Wiring Diagram Control board Termination Cabinet XPN7114", Rev. 34

E-210-020, "Electrical Wiring Diagram Control board Termination Cabinet XPN7110", Rev. 19

E-206-005, Simplified Plant Electrical Distribution, Rev. 25

E-206-005, Simplified Plant Electrical Distribution, Rev. 29

E-206-062, Elec. One Line and Relay Diagram, Vital DC System, Rev. 21
 E-206-022, Electrical. One Line & Relay Diagram, 7200V SWGR-Busses 1DA, 1DB, 1EA & 1EB, Rev. 16
 E-207-015, Electrical, Three Line Diagram, 7200V Switchgear – Bus 1DX, Rev. 21
 E-207-016, Electrical, Three Line Diagram, 7200V Switchgear – Bus 1DA, Rev. 16
 E-207-017, Electrical, Three Line Diagram, 7200V Switchgear – Bus 1DB, Rev. 17
 E-214-015, Electrical, Arrangement of Cable Trays, Turbine Building – NW – Above El. 436'-0", Rev. 6
 E-214-018, Electrical, Arrangement of Cable Trays, Turbine Building – SW – Above El. 436'-0", Rev. 5
 E-214-043, Electrical, Arrangement of Cable Trays, Control Bldg., Above El. 448'-0", NE, Rev. 25
 E-214-049, Electrical, Arrangement of Cable Trays, Control Bldg., Above El. 448'-0", SE, Rev. 23
 E-214-051, Electrical, Arrangement of Cable Trays, Control Bldg., Above El. 448'-0", NW & SW, Rev. 16
 E-214-133, Electrical, Arrangement of Cable Trays, Intermediate Bldg. W, Above El. 436'-0", Rev. 15
 E-214-134, Electrical, Arrangement of Cable Trays, Intermediate Bldg. E, Above El. 436'-0", Rev. 02
 E-221-602, Conduit Layout Fire Protection, Turbine Building-Above El. 436'-0", Rev. 5
 IMS-33-028, Indoor Cable Bus Layout & Sections, Plan View, Elevation 436'-0", Col. A to Col. D, Rev. 5
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 IMS-33-016, Metal Clad Switchgear, Bus – 1DX Line u-Up-04, Rev. 4
 VCS-INE00033-NI, Nuclear Instrumentation System Instrument Loop Diagram Alternate Source Range Monitor, Rev. 1
 SS-211-082 Sh. C5, Electrical Block Diagram System RC, Rev. H
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 S-212-082, Circuit Schedule, Cable Routing and Termination Circuit Number RCC42A, Issue A
 SS-211-0128 SH. J16, Y9 Block Diagram
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 S-212-082, Circuit Schedule, Cable Routing and Termination Circuit Number RCC44A, Issue C
 VCS-IFT03541-EF, "Instrument Loop Diagram Emergency Feedwater To Steam Generator "B" Flow, Train B", Rev. 3
 1MS-22-2341, 2" & Under Feedwater Piping EL. 436'-0" Intermediate Bldg., Rev. 3
 1MS-54-420-0, Air Balance Submittal Data, Fire/Seal UL Classified Fire Damper, 10/28/77
 1MS-54-424-0, Ruskin Fire Damper Curtain Type Interlocking Blade, 1/17/78
 1MS-55-085, Sht. 12, Cable Spreading Room El. 448'-0", Pre-Action Sprinkler System, Rev. 7

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 NFPA 805 Fire Protection-High Safety Significance Monitoring Report, 2nd quarter 2016
 PTP-114.005, Emergency Light Units, Enclosure 10.2, Rev. 14
 Plant Health Report, V.C. Summer, Unit 1, Tier 1 2015 Period 3, report run date 05/10/2016
 Plant Health Report, V.C. Summer, Unit 1, Tier 1 2016 Period 1, report run date 08/31/
 Program Health Report-Fire Protection, June 2016
 System Health Report, Electrical System, 08/31/2016
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Task 1310467-72, Instrument and Control Cable data sheet, verified date 5/16/14
Task 1310467-73, Instrument and Control Cable data sheet, verified date 5/16/14
Task 1310467-040, Data Sheet for Cable Pulling, reviewed date 5/01/14
Task 1310467-094, Data Sheet for Cable Pulling, reviewed date 5/06/14

LIST OF ACRONYMS AND ABBREVIATIONS

ADAMS	Agency-wide Document Management System
AOP	Abnormal Operating Procedure
AP	Administrative Procedures
CAP	Corrective Action Program
CAPR	Corrective Action Program Requirement
CAQ	Condition Adverse to Quality
CFR	Code of Federal Regulations
CR	Condition Report
CREP	Control Room Evacuation Panel
DBD	Design Bases Document
DC	Direct Current
ECR	Engineering Change Report
ELU	Emergency Lighting Unit
FA	Fire Area
FOL	Facility Operating License
FRE	Fire Risk Evaluation
FPP	Fire Protection Program
FZ	Fire Zone
IMC	Inspection Manual Chapter
IP	NRC Inspection Procedure
KV	kilovolts
LAR	License Amendment Request
LIV	Licensee-identified violation
LTCA	Long-Term Corrective Actions
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	United States Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSCA	Nuclear Safety Capability Assessment
OMA	Operator Manual Actions
PARS	Public Access Records
PC-CKS	Cable Routing and Raceway Database Management System
PCS	Primary Control Station
PDFP	Portable Diesel Fire Pump
PI&R	Problem Identification and Resolution
VCSNS	V.C. Summer Nuclear Station
P&IDs	Piping and Instrumentation Diagrams
RAI	Request for Additional Information
Rev	Revision
SDP	Significance Determination Process
SER	Safety Evaluation Report
SL	Severity Level
SSC	Systems, Structures and Components
SSD	Safe Shutdown
TE	Traditional Enforcement
TFPI	Triennial Fire Protection Inspection
TR	Technical Report
UFSAR	Updated Final Safety Analysis Report
USNRC	United States Nuclear Regulatory Commission