



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

July 8, 2011

Mr. R. M. Krich
Vice President, Nuclear Licensing
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC TRIENNIAL FIRE PROTECTION
INSPECTION REPORT NO. 05000327/2011006 AND 05000328/2011006**

Dear Mr. Krich:

On February 11, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Sequoyah Nuclear Plant, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed with Mr. M. Skaggs, Site Vice President, and other members of your staff. As a result of post-inspection analysis of the inspection findings by the NRC and your staff, the nature of the results changed from that discussed on February 11, 2011, and these changes were discussed by telephone with Mr. G. Cook, Site Licensing Manager, and others on March 25, 2011, and again with Mr. M. Skaggs, and others on June 13, 2011. On July 8, 2011, a final exit meeting was conducted to discuss the results of this inspection with Mr. G. Cook, and other members of your staff.

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

The report documents two NRC-identified findings of very low safety significance (Green) which were determined to involve violations of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because the findings were entered into your corrective action program, the NRC is treating the violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC, 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001; and the NRC Resident Inspector at the Sequoyah Nuclear Plant.

In addition, if you disagree with the cross-cutting aspects assigned to the findings 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 Senior Resident Inspector at the Sequoyah Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Rebecca L. Nease, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos.: 50-327, 50-328
License Nos.: DPR-77, DPR-79

Enclosure: Inspection Report 05000327/2011006, 05000328/2011006
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to R. M. Krich from Rebecca L. Nease dated July 8, 2011.

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC TRIENNIAL FIRE PROTECTION
INSPECTION REPORT NO. 05000327/2011006 AND 05000328/2011006

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-327, 50-328

License Nos.: DPR-77, DPR-79

Report Nos.: 05000327/2011006, 05000328/2011006

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Units 1 and 2

Location: Soddy-Daisy, TN 37379

Dates: January 24 – 28, 2011 (Week 1)
February 7 – 11, 2011 (Week 2)

Inspectors: J. Dymek, Reactor Inspector
R. Fanner, Reactor Inspector
N. Merriweather, Senior Reactor Inspector
L. Suggs, Reactor Inspector
M. Thomas, Senior Reactor Inspector (Lead Inspector)

Accompanying Personnel: E. Bowman, Senior Project Manager, Office of Nuclear Reactor Regulation (Week 1 only)
J. Montgomery, Reactor Inspector (Week 2 only)

Approved by: R. Nease, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000327/2011-006, 05000328/2011-006; 01/24 - 28/2011 and 02/7 - 11/2011; Sequoyah Nuclear Plant, Units 1 and 2; Fire Protection.

This report covers an announced two-week triennial fire protection inspection composed of five regional inspectors. Two Green non-cited violations 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). Findings for which the SDP does not apply may be Green or be assigned a severity level after U.S. Nuclear Regulatory Commission (NRC) management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

- Green. The inspectors identified a non-cited violation of Sequoyah Operating License Conditions 2.C.(16) and 2.C.(13) for Units 1 and 2, respectively, for failure to establish compensatory measures for an obstructed sprinkler system. Specifically, scaffolding installed in auxiliary building fire area FAA-054/Room A01 was in a configuration which obstructed sprinkler heads A198 and A208. The licensee entered this issue into the corrective action program as Problem Evaluation Report 321911 and implemented compensatory measures (fire watches) in accordance with the approved fire protection program.

This finding was determined to be a performance deficiency because the licensee did not provide the required compensatory measures (fire watch) for sprinkler heads that were obstructed or blocked by scaffolding. This finding was more than minor because it affected the reactor safety mitigating systems cornerstone attribute of protection against external factors (i.e., fire) and it affected fire protection defense-in-depth strategies involving suppression systems. Failure to provide compensatory measures for obstructed sprinkler heads A198 and A208 would have reduced the licensee's ability to quickly extinguish a fire in the area. The inspectors evaluated this issue in accordance with Inspection Manual Chapter (IMC) 0609, Appendix F, Fire Protection Significance Determination Process, and determined that this finding was of very low safety significance (Green). The finding category of fixed fire protection systems was assigned, based upon that element of the plant fire protection program being impacted. The inspectors assigned a "low degradation" rating that reflected the severity of the observed deficiency. This rating was based upon meeting the criteria described in IMC 0609, Appendix F, Attachment 2 for fixed fire detection and suppression degradation. Specifically, less than 10% of the sprinkler heads were non-functional, there were functional heads within 10 feet of the combustibles of concern and the system was nominally code compliant. This finding was determined to have a cross cutting aspect in the Human Performance Area, Work Practices Component, because the licensee failed to define and effectively communicate expectations regarding procedural compliance and requirements for personnel to follow procedures (H.4.(b)). (Section 1R05.03)

- Green. The inspectors identified a non-cited violation of Operating License Conditions 2.C.(16) and 2.C.(13), for Units 1 and 2 respectively, for failure to install the automatic suppression system (sprinkler system) in the auxiliary building corridor

690 foot elevation, in accordance with applicable National Fire Protection Association (NFPA) Standard No. 13, "Automatic Sprinkler Systems." Specifically, NFPA 13-1975 required sprinklers to be installed within 12-inches of the ceiling. Portions of the auxiliary building sprinkler system were installed greater than 12-inches below the ceiling. As a result, the actuation of the fusible link type sprinklers would have been slower than originally intended after fire ignition. The licensee entered this issue into the corrective action program as Problem Evaluation Report 147467 and implemented compensatory measures (fire watches) in accordance with the approved fire protection program.

This finding was determined to be a performance deficiency because the licensee did not locate the sprinkler heads according to the applicable Code of Record for the facility. The finding was more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of protection against external factors (i.e. fire). It affected the objective of ensuring the reliability and capability of systems that respond to initiating events. The inspectors evaluated this issue in accordance with Inspection Manual Chapter (IMC) 0609, Appendix F, Fire Protection Significance Determination Process, and determined that this finding was of very low safety significance (Green). Pursuant to IMC 0609, Appendix F, the finding category was "fixed fire protection systems." The finding was of very low safety significance because of the limited number of sprinkler heads improperly installed, the proximity of the existing sprinklers to combustibles of concern, and the suppression system was nominally code compliant for all other aspects of design and installation. The inspectors determined that there was no cross-cutting aspect associated with this finding because the condition has existed since initial plant licensing and was not reflective of present performance. (Section 4OA5.1)

B. Licensee Identified Violations

A violation of very low safety significance that was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number 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) of the Sequoyah Nuclear Plant (SQN) Units 1 and 2. The inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)," issued September 30, 2010. The objective of the inspection was to review a minimum sample of 3 risk-significant fire areas (FAs) to verify implementation of the fire protection program (FPP) and to verify site specific implementation of at least one B.5.b mitigating strategy as well as the storage, maintenance, and testing of B.5.b mitigating equipment. The three FAs chosen for review were selected based on available risk information as analyzed onsite by a senior reactor analyst from Region II, data obtained in plant walk downs regarding potential ignition sources, location and characteristics of combustibles, and location of equipment needed to achieve and maintain safe shutdown (SSD) of the reactor. Other considerations for selecting the FAs were the relative complexity of the post-fire SSD procedure, information contained in FPP documents, and results of prior NRC TFPIs. In selecting the B.5.b mitigating strategy sample, the inspectors reviewed licensee submittal letters, safety evaluation reports, licensee commitments, B.5.b implementing procedures, and previous NRC inspection reports. Section 71111.05-05 of the IP specifies a minimum sample size of three FAs and one B.5.b implementing strategy for addressing large fires and explosions. This inspection fulfilled the requirements of the IP by selecting three FAs and one B.5.b mitigating strategy. The three FAs chosen were:

- Fire Area FAC-012 / Room C04, Unit 2 Auxiliary Instrument Room
- Fire Area FAA-054 / Room A01, Corridor (Unit 1 area)
- Fire Area FAA-081 / Room A24, 6.9KV Shutdown Board Room B (Units 1 and 2)

For each FA selected, the inspectors evaluated the licensee's FPP against the applicable NRC requirements. Specific licensing basis documents reviewed by the inspectors are listed in the Attachment.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The inspectors reviewed the licensee's post-fire SSD analysis and abnormal operating procedures (AOPs) to verify the ability to achieve hot and cold plant shutdown from the main control room (MCR) with or without the availability of offsite power for a postulated fire in FAs FAA-054 or FAA-081 of the auxiliary building. The inspection activities focused on those systems and components that were required for SSD and provided the functions for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation, and related support systems.

The inspectors reviewed those portions of the licensee's Fire Protection Report (FPR) and Fire Hazards Analysis (FHA) Calculation SQN-26-D054/EPM-ABB-IMPFFHA which

described the licensee's SSD analysis for a fire in the selected fire areas. The SSD analysis identified both affected and available components and the safe shutdown compliance strategies for fires in the selected fire areas. Through a combination of design information review and in-plant inspection, the inspectors ascertained whether the fire protection features in place to protect the SSD systems and components satisfied the requirements of the FPP which committed to meet the requirements of 10 CFR 50 Appendix R, Sections III.G, III.J, III.L, and III.O.

Section III.G.2 of 10 CFR 50 Appendix R specifies the separation and design requirements to protect one train of cables and equipment necessary to achieve and maintain hot shutdown conditions from fire damage when redundant trains are located within the same fire area. In cases where the separation requirements of Section III.G.2 were not met and local operator manual actions (OMAs) were utilized by the licensee in lieu of protection, the inspectors verified that the OMAs were implemented in accordance with the approved FPP, which may have required prior NRC approval. The inspectors reviewed the OMAs to verify that they were feasible, consistent with the guidance provided in Section 02.02.j.2 of IP 71111.05T. Another objective for reviewing the SSD analysis was to understand its details so it could be determined whether the operations post-fire shutdown procedures were consistent with the analysis.

b. Findings

Introduction: The inspectors identified an unresolved item (URI) related to the licensee's failure to protect cables and equipment required to achieve hot shutdown to ensure that one train was free of fire damage in accordance with the requirements of the approved fire protection program as described in SQN Operating License Conditions (OLCs) 2.C(16) and 2.C(13) for Units 1 and 2 respectively.

Description: The inspectors reviewed the licensee's post-fire SSD methodology for a fire in FA FAA-054/Room A01 or FA FAA-081/Room A24. Post-fire SSD for either of these FAs would be achieved from the MCR using AOP-N.01, "Plant Fires," and AOP-N.08, "Appendix R Fire Safe Shutdown." During this review the inspectors noted that in lieu of protecting the cables of equipment identified by the licensee as being required for post-fire SSD (i.e., provide barriers and spatial separation with detection and suppression), the SQN SSD methodology (for the above two FAs and numerous other FAs) also credited the use of OMAs. These new OMAs were not submitted to the NRC for review and/or approval prior to incorporation into the plant AOPs. Sequoyah added these new OMAs to their FPP in 2002 without seeking prior NRC approval because they believed their current OLCs (approved by NRC SER dated August 12, 1997 and applicable to plants licensed after January 1, 1979) allowed them to make these changes without prior NRC approval if they could demonstrate that the changes had no adverse impact on SSD. Sequoyah Units 1 and 2 were both licensed to operate after January 1, 1979. The SQN evaluation (dated March 2002) which added the OMAs concluded that adding the OMAs did not adversely affect SSD because the licensee determined at that time that the OMAs were feasible. The inspectors concluded that the licensee's methodology of allowing fire damage to occur (instead of protecting SSD cables and equipment) and relying on OMAs to achieve post-fire SSD would adversely affect the ability to achieve and maintain SSD in the event of a fire. The inspectors reviewed the SQN evaluation which added the OMAs and concluded that the evaluation was not adequate to support the conclusion that adding the OMAs did not adversely affect post-fire SSD because the evaluation did not address defense-in-depth. During this inspection, SQN personnel

stated that there were no plans at the time to implement modifications or submit the OMAs added in March 2002 for NRC review and approval. Subsequent to the onsite inspection, the licensee submitted additional information to the inspectors in support of their conclusion that the OMAs added in 2002 did not affect SSD. Additionally, the licensee initiated Problem Evaluation Report (PER) 324757 to address this issue. The inspectors are reviewing this information relative to the SQN licensing basis. This issue is identified as unresolved item (URI) 05000327, 328/2011006-01, Use of Operator Manual Actions in Lieu of Protecting Cables and Equipment Required for Post-Fire Safe Shutdown. This issue is unresolved pending further NRC review of this information and the Sequoyah fire protection licensing basis.

.02 Passive Fire Protection

a. Inspection Scope

For the selected FAs, the inspectors evaluated the adequacy of fire barrier walls, ceilings, floors, mechanical and electrical penetration seals, fire doors, fire dampers and electrical raceway fire barrier systems (ERFBS). The inspectors walked down accessible portions of the selected fire areas to observe the material condition of fire barriers. The inspectors reviewed the configuration of the installed ERFBS to the TVA G-98 Installation & Modification Specification for ERFBS to confirm that the appropriate materials and construction methods were used to assure that the respective fire barriers met their intended design function. The inspectors reviewed SQN-26-D054/EPM-ABB-IMPFHA Fire Hazards Analysis Calculations for the selected fire areas to verify that the plant fire loading used by the licensee was appropriate for the stated fire resistance rating of the fire barrier enclosures. The inspectors reviewed fire protection penetration seal details analysis against penetrations within the selected fire areas. The inspectors also reviewed a representative sample of completed surveillances for fire doors, fire dampers, penetration seals and ERFBS performed since the last TFPI in June 2008.

b. Findings

No findings were identified

.03 Active Fire Protection

a. Inspection Scope

For the selected FAs, the inspectors performed in-plant observations of the material condition and operational lineup of fire detection, fire protection water supply, automatic water and carbon dioxide fire suppression systems, and manual fire hose and standpipe systems. The inspectors observed the performance of surveillance test 0-SI-FPU-026-192.M, Motor Driven Fire Pump A Operability Test. The inspectors reviewed the fire detection and suppression methods for the types of fire hazards existing in the selected FAs. The inspectors also compared the fire detection and fire suppression systems to the applicable National Fire Protection Association (NFPA) Standard(s) for the selected FAs by reviewing design documents and observing their as-installed configurations as part of performing the in-plant walkdowns. The inspectors compared the testing and maintenance program for the fire detection and suppression systems to the testing and maintenance requirements of the Sequoyah FPP.

For the selected FAs, the inspectors compared fire fighting pre-plan strategies to existing plant layout and equipment configuration and to the fire response procedures. The inspectors assessed the condition of fire fighting and smoke control equipment by inspecting equipment located at fire brigade staging and dress out areas. The inspectors evaluated fire brigade staffing, qualification and training, and reviewed all drill records for 2009 and 2010. The current mutual aid contract between TVA and the Soddy Daisy Fire Department was reviewed as well as the most recent fire drills with off-site responders. Specific attributes of fire brigade conduct was evaluated by the inspectors which included selection and implementation of appropriate strategy and tactics, command and control, communications, and use of fire brigade equipment.

b. Findings

Introduction: The inspectors identified a Green non-cited violation (NCV) of SQN OLCs 2.C.(16) and 2.C.(13) for Units 1 and 2, respectively, for failure to establish compensatory measures for an obstructed sprinkler system. Specifically, scaffolding installed in FA FAA-054/Room A01 was in a configuration which would have blocked the water spray pattern of sprinkler heads A198 and A208.

Description: During an inspection of FA FAA-054-A01, the inspectors noted that continuous, solid metal scaffolding had been erected between auxiliary building water chillers CHR-313-662 A and CHR-313-662B. The scaffolding was erected approximately 8 ft. above the 714 ft. floor elevation between column lines A3/T and A4/T. The scaffoldings' dimensions were 11 ft. wide and 15 ft. long. The observed scaffolding was placed directly below a ceiling level pre-action sprinkler system installed to protect in-situ and transient combustibles in the FAA-054-A01 Corridor. Due to the dimensions of this scaffolding, the water spray pattern of sprinkler heads A198 and A208 would have been blocked. This would have degraded the suppression capability of the sprinklers for fires involving transient combustible materials left under the scaffolding or from a possible in-situ chiller oil reservoir spill on the floor.

The scaffolding was installed to support the removal and reinstallation of water pipe insulation covered under work order 08-776667-000. Two sections of scaffolding approximately 3 ft. wide by 15 ft. long were installed parallel to each other immediately adjacent to chillers CHR-313-662 A and CHR-313-662B with an approximate 5 ft. gap between them. A third section of scaffolding was subsequently installed such that the overall scaffold system configuration resulted in sprinkler system heads A198 and A208 being inoperable due to the heads being blocked by the scaffolding. No review by fire operations personnel was performed and the blocked sprinkler heads were not identified.

The SQN FPR, Part II, Section 14.3 requires that with one or more of the required spray and/or sprinkler systems inoperable (e.g., sprinklers blocked), establish a continuous fire watch within one hour with backup fire suppression equipment for those areas in which redundant systems or components could be damaged. The scaffolding configuration blocking sprinkler heads A198 and A208 existed from when it was first installed on February 1, 2011, until identified by the inspectors on February 9, 2011. When it was confirmed by fire operations that the scaffolding had not been previously reviewed, nor compensatory measures established, licensee personnel immediately established the required fire watch and initiated removal of the scaffolding. The licensee initiated PER 321151 to document this condition and enter it into the corrective action program (CAP).

Analysis: This finding was determined to be a performance deficiency because the licensee did not provide the required compensatory measures (fire watch) for sprinkler heads that were obstructed or blocked by scaffolding. This finding was more than minor because it affected the reactor safety mitigating systems cornerstone attribute of protection against external factors (i.e., fire) and it affected fire protection defense-in-depth strategies involving suppression systems. Failure to provide compensatory measures for obstructed sprinkler heads A198 and A208 would have reduced the licensee's ability to quickly extinguish a fire in the area. The inspectors evaluated this issue in accordance with Inspection Manual Chapter (IMC) 0609, Appendix F, Fire Protection Significance Determination Process, and determined that this finding was of very low safety significance (Green). The finding category of fixed fire protection systems was assigned, based upon that element of the plant fire protection program being impacted. The inspectors assigned a "low degradation" rating that reflected the severity of the observed deficiency. This rating was based upon meeting the criteria described in IMC 0609, Appendix F, Attachment 2 for fixed fire detection and suppression degradation. Specifically, less than 10% of the sprinkler heads were non-functional, there were functional heads within 10 feet of the combustibles of concern and the system was nominally code compliant.

This finding was determined to have a cross cutting aspect in the Human Performance Area, Work Practices Component, because the licensee failed to define and effectively communicate expectations regarding procedural compliance and requirements for personnel to follow procedures. (H.4.(b))

Enforcement: Sequoyah Operating License Conditions 2.C.(16) and 2.C.(13) for Units 1 and 2 respectively, state in part, that the licensee shall implement and maintain in effect all provisions of the approved fire protection program referenced in the SQN Final Safety Analysis Report (FSAR) and as approved in NRC SERs contained in NUREG-0011, Supplements 1, 2, and 5; NUREG-1232, Volume 2; NRC letters dated May 29 and October 6, 1986; and the Safety Evaluation issued on August 12, 1997. Sequoyah FSAR Section 9.5.1, Fire Protection System, states that the fire protection system and fire protection features are described in the SQN FPR, and the FPR should be referred to for a detailed description of the FPP. The SQN FPR, Part II, Section 14.3 states that with one or more of the required spray and/or sprinkler systems (e.g., sprinkler heads) inoperable, establish compensatory measures (i.e., a continuous fire watch) within one hour with backup fire suppression equipment for those areas in which redundant systems or components could be damaged.

Contrary to the above, between February 1, 2011 and February 9, 2011, the licensee did not implement all provisions of the approved fire protection program in that they failed to establish adequate compensatory measures (i.e., continuous fire watch) for sprinklers blocked by scaffolding erected in FA FAA-054-A01, Auxiliary Building Elevation 714 ft. Corridor. Because this violation was of very low safety significance (Green) and has been entered into the licensee's corrective action program as PER 321151, this finding is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy and is identified as NCV 05000327, 328/2011006-02, Failure to Establish Compensatory Actions for Blocked Sprinklers.

.04 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The inspectors evaluated whether the installed automatic CO2 system, the pre-action sprinkler systems or manual fire fighting activities for the selected FAs could adversely affect equipment credited for SSD, inhibit access to alternate shutdown equipment, or adversely affect local operator actions required for SSD. The inspectors considered the consequences of a rupture, inadvertent operation or actual operation of a fire suppression system concurrent with manual fire fighting activities as could result from a fully involved fire in one of the selected fire areas. The inspectors reviewed the supporting hydraulic drainage calculation nos. SQN-77-D053/2-M2-MLV-063085-3 for FAA-054 and SQN-77-D053/2-M2-MLV-063085-4 for FAA-081. The inspectors reviewed SQN evaluation SER-3-98, "Fire Protection System Water Hammer". This evaluation addressed applicable portions of Information Notice (IN) 98-31, "Fire Protection System Design Deficiencies and Common Mode Flooding of Emergency Core Cooling System Rooms at Washington Nuclear Project Unit 2." The inspectors reviewed pre-fire plans and fire AOPs which address the opening of doors to drain water so that OMAs may be performed. The inspectors reviewed the potential impact of a failure, mal-operation or actual discharge of the CO2 system protecting FAC-012. It was noted that the low pressure multi-ton CO2 storage tank and the associated master selector valve for the system is located in a vault outside the power block. Fire areas protected by CO2 have ventilation systems installed to remove CO2 discharged to these areas. Because CO2 is odorless, the CO2 system has a wintergreen odorizer that is mixed into the CO2 as it discharges into the fire area. Pre-fire plans address the possible operation of the CO2 system and specifically address precautions, ventilation methodology and post fire considerations such as re-occupation of the area.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. Inspection Scope

The inspectors reviewed the licensee's SSD analysis and evaluated the licensee's ability to achieve and maintain hot and cold plant shutdown with and without the availability of offsite power for a postulated fire in FA FAC-012/Room C04 of the control building. The inspection activities focused on ensuring the adequacy of systems and components required for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation, and support system functions.

Operational Implementation

The inspectors walked down FA FAC-012/Room C04 and examined the material condition of the fire detection, suppression, and fire area boundaries. The inspectors reviewed the FPR and FHA to verify that equipment required for post-fire safe shutdown was adequately protected from fire damage in accordance with the FPP. The inspectors reviewed cable routing information for a selected sample of SSD components credited for use during this shutdown method to evaluate if the components and cables would

remain free from fire damage or that acceptable OMAs had been established in the operating procedures. In cases where local OMAs were credited in-lieu of cable protection of SSD components, the inspectors verified that the OMAs were feasible utilizing the guidance of NRC IP 71111.05T.

The inspectors reviewed selected job performance measures for licensed and non-licensed operators to verify that the training reinforced the shutdown methodology in the SSD analysis and abnormal procedures for the selected FAs. The inspectors also conducted interviews, reviewed shift turnover logs and shift manning to verify that personnel required for SSD using alternative shutdown systems and procedures were available onsite, exclusive of those assigned as fire brigade members.

The inspectors performed a tabletop review of abnormal operating procedure AOP-C.04, "Shutdown From Auxiliary Control Room," and also performed a walk-through of selected procedure steps to ensure the implementation and human factors adequacy of the procedure. The inspectors walked down the in-plant location of selected OMAs specified in the AOP with operations personnel to evaluate the environmental conditions, relative difficulty and operator familiarization associated with each OMA. The inspectors reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage. The inspectors reviewed selected 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.

The inspectors reviewed surveillance tests records for some of the transfer switches that were required to transfer plant controls from the MCR room to the auxiliary control room to verify that the transfer switches were functional. The test program was implemented by periodic test instructions which included steps for the verification of remote shutdown transfer capability. The test program tested 25% of the transfer switches every outage with all credited switches tested over a 72 month period. The inspectors reviewed the last two completed surveillances performed on Units 1 and 2. By reviewing the records, the inspectors confirmed that testing was performed to demonstrate functionality of the Appendix R transfer switches, and that test deficiencies were documented and addressed in the corrective action program. Reviews also included verification that alternative shutdown could be accomplished with or without offsite power.

b. Findings

No findings were identified.

.06 Circuit Analyses

a. Inspection Scope

A sample of SSD components important to safe shutdown were selected to evaluate if the existing fire emergency procedures were adequate for a postulated fire in any of the selected FAs. The cables examined were based upon a list of SSD components selected by the inspectors after a review of the FHA, SSD systems mechanical flow and control diagrams, cable routing data, wiring diagrams, block diagrams, and plant fire response procedures. The inspectors reviewed the electrical block and control wiring diagrams and identified the cables associated with the SSD components and examined

in detail the cable routing and potential for fire damage and the effects on the circuit. The components important to SSD credited in the alternative shutdown procedures were reviewed to verify that the transfer switches associated with these components would adequately transfer control and power from the main control room to the auxiliary control room. Cable routing data was also reviewed for these components to verify that the cables for the sampled transfer switches were not routed in the selected fire areas or were adequately protected by electrical isolators. The inspectors noted that the licensee has completed an analysis for multiple spurious circuit faults utilizing NRC and industry guidance and identified several items in the corrective action program for resolution. A list of the components selected for review is included in the Attachment.

b. Findings

No findings were identified.

.07 Communications

a. Inspection Scope

The inspectors assessed fixed and portable plant communication capabilities to evaluate the availability of the communication systems to support plant personnel in the performance of OMAs to achieve and maintain safe shutdown. The inspectors assessed the capability of the sound powered phones and reviewed cable routing for plant radios and plant phones to verify that communication equipment would not be affected by a fire in the selected FAs. The inspectors also verified, by walkdown, that the location of communications equipment would not be affected by a fire. The inspectors reviewed preventative maintenance and surveillance test records to verify that the communication equipment was being properly maintained.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The inspectors inspected maintenance and design aspects of the fixed 8-hour battery pack emergency lighting units (ELUs) required by the licensee's FPP. The inspectors performed plant walkdowns of the post-fire SSD procedures for the selected FAs to observe the placement and coverage area of the ELUs throughout the selected FAs. The inspectors also evaluated the adequacy of the ELUs to illuminate access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire SSD. The inspectors reviewed preventive maintenance procedures and completed surveillance tests to verify that adequate surveillance testing was in place. The inspectors reviewed vendor manuals to ensure that the ELUs were being maintained consistent with manufacturer's recommendations. Work orders and PERs were reviewed to ensure that ELU surveillance test failures were addressed appropriately.

b. Findings

No findings were identified.

.09 Cold Shutdown Repairs

a. Inspection Scope

The inspectors verified that the licensee was capable of making necessary repairs to proceed to cold shutdown within 72 hours for the selected III.G.2 fire areas. The inspectors reviewed Special Maintenance Instruction SMI-0-317-18, "Appendix R – Casualty Procedures," Revision 10, and sections of FHA Calculation SQN-26-D054/EPM-ABB-IMPFA for III.G.2 fire areas FAA-054 Section 1 and FAA-081 to confirm that adequate procedures were available for the repair of equipment required to achieve and maintain cold shutdown. The inspectors found that the necessary cold shutdown repairs were outlined in the casualty procedures for each of the selected fire areas. Based on a review of the documentation and a physical inspection of the repair kits, the inspectors verified that the equipment needed to make the specified repairs were available onsite and included in the Appendix R Equipment Inventory stored in the warehouse.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection scope

The inspectors reviewed the administrative controls for out-of-service, degraded and/or inoperable fire protection features (e.g. detection and suppression systems and passive fire barriers). The inspectors reviewed selected items from the impairment list and compared them to the FAs selected for the inspection. The inspectors also observed performance of a fire protection surveillance activity, including implementation of compensatory measures.

The inspectors interviewed continuous fire watch personnel stationed in control building elevations 706 ft. and 732 ft. that were posted for fire suppression systems made inoperable by the closing of valve 0-FCV-26-211. The inspectors reviewed the issuance of Hot Work Permit No. 111003140 for welding and cutting in the cable spreading room and observed the performance of the fire watch required for such work.

b. Findings

No findings were identified.

.11 B.5.b Mitigating Strategya. Inspection Scope

The inspectors reviewed, on a sample basis, the licensee's spent fuel pool external spray mitigation measures for large fires and explosions to verify that the measures were feasible, personnel were trained to implement the strategies, and equipment was properly staged and maintained. The inspectors reviewed the licensee's established program, applicable SERs and submittals which supported the elements outlined by the license condition. The inspectors reviewed inventory, surveillance testing, and maintenance records of required equipment. Through discussions with plant staff, documentation review, and plant walk-downs, the inspectors verified the engineering basis to establish reasonable assurance that the makeup capacity could be provided using the specified equipment and water sources. The inspectors reviewed the licensee's capability to provide a reliable and available water source and the ability to provide the minimum fuel supply. The inspectors performed a walk-down of the storage and staging areas for the B.5.b equipment to verify that equipment identified for use in the current procedures was available and maintained. The inspectors reviewed training records of the licensee's staff to verify that operations and security personnel training/familiarity with the strategy objectives and implementing guidelines were accomplished according to the established training procedures.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES4OA2 Identification and Resolution of Problemsa. Inspection Scope

The inspectors reviewed recent independent licensee audits for thoroughness, completeness and conformance to requirements. Requirements for the independent audits are contained in Generic Letter 82-21 "Technical Specifications for Fire Protection Audits" and the licensee's Quality Assurance Program, as well as Appendix A to BTP APCS 9.5-1 "Guidelines for Fire Protection for Nuclear Power Plants," Section C.10, Audits. The inspectors reviewed other corrective action program documents, including completed corrective actions documented in selected PERs, and operating experience program documents to verify that industry-identified fire protection problems potentially or actually affecting the plant were appropriately entered into and resolved by the licensee's CAP. The inspectors included NRC Regulatory Issue Summaries, information notices, industry and vendor-generated reports of defects and noncompliance under 10 CFR Part 21, and vendor information letters in their review of operating experience program effectiveness. The inspectors reviewed the timeliness, apparent cause determination, proposed corrective action, and other attributes associated with a sample of PERs. The PERs reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion

(Closed) Licensee Event Report (LER) 05000327/2009-001-00: Appendix R Unanalyzed Condition Affecting Safety Related Shutdown Boards

On January 28, 2009, during an audit of the Fire Protection Program, the licensee identified a postulated Appendix R fire scenario that could defeat essential breaker coordination between the load and feeder breakers required to protect the power supply to the 6900-volt shutdown boards. This scenario involves a fire in Fire Area 1, Elevation 669, Auxiliary Building Corridor or Fire Area 29, Elevation 690 Auxiliary Building General Area, that could potentially cause a loss of power to fire safe shutdown equipment required to achieve and maintain hot shutdown for compliance with 10 CFR Part 50, Appendix R.

The scenario occurs when the load breaker's 125-volt direct current (DC) control circuit is damaged in the fire and could potentially open the control circuit fuses, subsequently disabling the breaker's trip circuit containing the over-current relay protection. After the over-current protection has been disabled, the same fire could damage the 6900-volt power cables causing a phase-to-phase fault. The load breaker would not be able to clear the fault with the trip circuit control power fuses blown. Therefore, the feeder breaker would be the next protection device to clear the fault. However, opening the feeder breaker causes a loss of the 6900-volt shutdown board and all associated electrical boards fed from that bus.

In FAs 1 and 29, the power cables were routed in close proximity to the 125-volt DC control circuit cables for the local control hand switch for pumps fed from the 6900-volt shutdown boards. The licensee's post fire safe shutdown strategy did not account for the loss of any auxiliary power boards in either of the affected fire areas. The licensee entered this issue into their corrective action program under PER 162189, "Potential Unanalyzed Condition Affecting 6900V Shutdown Boards" and immediately initiated hourly fire watches for Fire Areas 1 and 29 in accordance with the SQN FPR, Part II, Section 14.6. Subsequently, the licensee initiated DCN D22367 to remove the local hand switches and spare associated cables to the pumps related to this scenario. The inspectors concluded that the licensee's corrective actions were appropriate and reasonable. Enforcement aspects of this LER are discussed in Section 4OA7 of this IR. The documents reviewed are listed in the Attachment. This LER is closed.

4OA5 Other Activities

.1 (Closed) URI 05000327, 328/2008006-02, Sprinkler System in Room 690.0-A1 of the Auxiliary Building has NFPA Code Deviation

a. Inspection Scope

This URI concerning the design of the sprinkler system in the eastern portion of the Auxiliary Building elevation 690 ft. (Room 690.0-A1, FA FAA-029) was opened during the 2008 TFPI (IR 05000327, 328/2008006) to determine if the as-built configuration had been approved by the NRC, and to review the capacity and capability of the as-built configuration to suppress fires. The inspectors reviewed the licensing basis documents listed in OLCs 2.C.(16) and 2.C.(13) for Units 1 and 2 respectively, and could not identify

where the NRC had reviewed and approved the installed sprinkler head configuration, nor did the inspectors find where the NRC had approved a deviation from the NFPA Code of Record (NFPA 13-1975) for FA FAA-029.

b. Findings

Introduction: The inspectors identified a Green NCV of OLCs 2.C.(16) and 2.C.(13), for Units 1 and 2 respectively, for failure to install the automatic suppression system (sprinkler system) in the Auxiliary Building elevation 690 ft. Corridor, in accordance with applicable NFPA Standard No. 13, "Automatic Sprinkler Systems." Specifically, NFPA No. 13-1975 requires sprinklers to be installed within 12-inches of the ceiling. Portions of the Auxiliary Building sprinkler system located between column lines A6-A10/U and A6-A10W were installed greater than 12-inches below the ceiling. As a result, the actuation of the fusible link type sprinklers would be slower than originally intended after fire ignition.

Description: Fire Area FAA-029, between column lines A6-A10/U and A6-A10/W was described as an access corridor. It contained a limited number of ignition sources, identified in drawings and by walkdowns as three electrical panels immediately adjacent to column A7/V. Cable trays were located in the overhead spaces approximately 14 ft. to 20 ft. above the floor. The ceiling was 22 ft.-6 inches above the 690 ft. floor elevation. Fire Area FAA-029 contained a large equipment hatch, an elevator, and an open stairwell, designated as stair No. 3. The equipment hatch and stairwell were originally protected by sprinklers that extended slightly into the open vertical space at elevation 710 ft.-6 inches, or approximately two ft. below the ceiling. These were installed to protect against combustibles that may have been in transit in the hatch area or the stairwell. Additional sprinklers were installed adjacent to or above cable trays to protect the conductors against the spread of fire, both vertically and horizontally, within the trays below. These sprinkler heads were installed at elevation 706 ft.-6 inches or approximately six-feet below the ceiling. The design of the sprinkler system for the auxiliary building elevation 690 ft. specified a minimum design density of 0.16 gpm/sq. ft. and a maximum coverage area of 130 sq. ft. per head. The floor area between column lines A6-A10/U and A6-A10W was 53 ft. by 42 ft. which was 2226 sq. ft. This area was protected by 23 sprinkler heads. The actual coverage area was conservatively designed to approximately 96 sq. ft. per head. The Code of Record, NFPA 13, 1975 edition, Section 4-3.1 requires that ceiling level sprinklers be installed within 12-inches of smooth ceiling construction. The sprinkler heads were standard release upright pendant type heads, with a rating of 212 degree F (intermediate class). The installed sprinkler heads within the A6-A10/U and A6-A10W grid were outside their laboratory tested configurations and NFPA-13 installation requirements, which would likely lead to a slower sprinkler response for heads installed under the projected ceiling jet and outside the fire plume.

Analysis: This finding was determined to be a performance deficiency because the licensee did not locate the sprinkler heads according to the applicable NFPA code of record for the facility. The finding was more than minor because it was associated with the reactor safety, mitigating systems cornerstone attribute of protection against external factors (i.e. fire). It affected the objective of ensuring the reliability and capability of systems that respond to initiating events. The risk significance of the finding was determined in accordance with IMC 0609, Appendix F, Fire Protection Significance Determination Process. Pursuant to IMC 0609, Appendix F, the finding category was

“fixed fire protection systems”. The nature of the degradation of the water based suppression system was related to the response time of the sprinkler system. The installed configuration of these heads would likely result in a response time slower than that meeting the installation requirements of NFPA 13. Using Attachment 2 of IMC 0609, Appendix F, a degradation rating of “Low” was assigned. This was based upon the following three criteria: 1) the licensee’s identification of 20 out of 361 installed sprinkler heads being out of conformance with NFPA 13 for the sprinkler system protecting the 690 ft. elevation of the auxiliary building. This met the “Low” degradation screening threshold of less than 10% of heads non-functional. 2) Functional sprinkler heads were located within 10 ft. of combustibles of concern. Sprinkler heads C282, C284 and C286 were installed above each of the electrical panels (combustibles of concern) within approximately 18-inches horizontally from the panel edges. This placed the sprinklers within the fire plume zone of influence as shown in IMC 0609 Appendix F Table 2.3.3 for any of the fire heat release rate (HRR) values for a fire located near a wall for either the thermoplastic cables. For this reason these three heads were considered functional for protection against combustibles of concern and therefore met the “Low” degradation criteria of functional heads being within ten feet of combustibles of concern. 3) The system was considered nominally code compliant for all other aspects of installation, other than the location of the sprinklers below the ceiling. The maximum area of coverage was conservatively averaged for 96 sq. ft./head vs. 130 sq. ft./head allowed. Within the area of concern between column lines A7-A8/U and A6-A10W, a total of 14 sprinkler heads provided coverage for an area of approximately 795 sq. ft. The average area of coverage per sprinkler head between column lines A7-A8/U and A6-A10W was 56 sq. ft. per head. Due to this close proximity, these heads were fitted with square metal caps to prevent water spray from one fused head cooling the link of the adjacent head. The sprinkler system was installed to an NFPA pipe schedule type hydraulic design. Systems designed by this method typically result in their installed average sprinkler discharge density being greater than the specified minimum design density (0.16 gpm/sq. ft.) over the hydraulically most limiting point of the system. Except as noted, the system was considered to be nominally code compliant and therefore met the low degradation criteria for water based suppression systems. As a result of this qualitative screening, the finding was assigned a low degradation rating. The finding screened to Green, and no further analysis was required. There was no cross-cutting associated with this finding because the condition has existed since initial plant licensing and was not reflective of current licensee performance.

Enforcement: Sequoyah OLCs 2.C(16) and 2.C(13) for Units 1 and 2 respectively, require that TVA implement and maintain in effect all provisions of the approved fire protection program referenced in the SQN FSAR. FSAR Section 9.5.1.1 states that the fire protection system and fire protection features are described in the FPR. Part VI, Section 3.3 of the FPR states that NFPA 13-1975, Automatic Sprinkler Systems, is the code used to evaluate the adequacy of the sprinkler systems. NFPA 13, Section 4-3.1 requires that ceiling level sprinklers be installed within 12-inches of smooth ceiling construction.

Contrary to the above, the licensee failed to implement all provisions of the approved fire protection program in that, the east portion of auxiliary building 690 ft. elevation did not have sprinklers installed within 12-inches of the ceiling between column lines A6-A10/U and A6-A10W. This condition has existed since initial plant licensing. The inspectors noted that modifications to restore the sprinkler system to compliance were being implemented by design change notice D22408, Stage 1. Because this finding was of

very low safety significance (Green) and was entered into the licensee's CAP as PER 147467, this finding is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. This finding is identified as NCV 05000327, 328/2011006-03, Sprinkler System in Room 690.0-A1 of the Auxiliary Building has NFPA Code Deviation.

40A6 Meetings, Including Exit

On February 11, 2011, the lead inspector presented the inspection results to M. Skaggs, SQN Site Vice President, and other members of the licensee's staff. The licensee acknowledged the findings. The inspection results were updated in a telephone call on March 25, 2011, with G. Cook, Site Licensing Manager, and members of the licensee's staff. The inspection results were updated again in a telephone call on June 13, 2011, with M. Skaggs and other members of the licensee's staff. A final exit meeting was conducted on July 8, 2011, with G. Cook and other members of the licensee's staff. Proprietary information is not included in this report.

40A7 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 meet the criteria of the NRC Enforcement Policy, for being dispositioned as an NCV.

- Sequoyah Fire Protection License Condition 2.C.(16) for Unit 1 requires that TVA implement and maintain in effect all provisions of the approved fire protection program referenced in the Sequoyah Nuclear Plant's Final Safety Analysis Report (FSAR) as described in the Fire Protection Report (FPR). Part III of the FPR states that SQN must comply with 10 CFR 50 Appendix R, Section III.G. Section III.G.2 requires that where cables or equipment of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area means of ensuring that one of the redundant trains is free of fire damage shall be provided.

Contrary to the above, on January 28, 2009, the licensee identified that cables associated with the Unit 1 6900-volt power supply in fire areas FAA 1 and 29 would not be free of fire damage to support safe shutdown (see Section 40A3). This violation is of very low safety significance (Green). This issue was determined to be of very low safety significance based on the results of the IMC 0609, Appendix F, "Fire Protection Significance Determination Process," Phase II Quantitative Screening Approach. This violation was documented in the licensee's CAP as PER 162189.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

S. Bowman, Licensing Engineer
B. Carrier, Operations Support
T. Carson, Director of Projects
I. Collins, Engineering Programs Manager
P. Colman, Safe Shutdown Contractor
G. Cook, Site Licensing Manager
E. Craig, Mechanical Design
R. Egli, Fire Protection/Appendix R Program Owner
D. Green, Corporate Licensing Manager
R. Detwiler, Director, Safety and Licensing
J. Furr, Quality Assurance Manager
P. Johnson, Fire Protection Supervisor
K. Langdon, Plant Manager
D. Porter, Operations Procedures
R. Proffitt, Licensing Supervisor
B. Simril, Corporate Fire Protection Manager
M. Skaggs, Site Vice President
T. Skiba, Mechanical Design Engineering Manager
D. Sutton, Licensing Engineer
N. Thomas, Licensing Engineer
R. Thompson, Safety and Licensing
E. Turner, Electrical Design Engineer
B. Wetzel, Sequoyah Licensing Manager
K. Wilkes, Operations Support Superintendent
J. Williams, Site Engineering Director

NRC personnel

H. Christensen, Deputy Division Director, Division of Reactor Safety, Region II
M. Speck, Resident Inspector
C. Young, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000327, 328/2011006-01	URI	Use of Operator Manual Actions in Lieu of Protecting Cables and Equipment Required for Post-Fire Safe Shutdown (Section 1R05.01.b)
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Opened and Closed

05000327, 328/2011006-02	NCV	Failure to Establish Compensatory Actions for Blocked Sprinklers (Section 1R05.03.b)
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05000327, 328/2011006-03	NCV	Sprinkler System in Room 690.0-A1 of the Auxiliary Building has NFPA Code Deviation (Section 4OA5)
<u>Closed</u>		
05000327, 328/2008006-02	URI	Sprinkler System in Room 690.0-A1 of the Auxiliary Building has NFPA Code Deviation (Section 4OA5)
05000327/2009-001-00	LER	Appendix R Unanalyzed Condition Affecting Safety related Shutdown Boards (Section 4OA3)

LIST OF COMPONENTS REVIEWED
(Refer to Report Section 1R05.01 / 1R05.05 / 1R05.06 – Circuit Analyses)

<u>Component Identification</u>	<u>Description</u>
<u>Valves</u>	
2-FCV-062-090	Charging Flow Isolation Valve
2-FCV-062-091	Charging Flow Isolation Valve
2-FCV-062-093	Charging Header Flow Control Valve
<u>Pump Motors</u>	
2-PMP-062-104	Centrifugal Charging Pump (CCP) 2B-B
2-PMP-062-108	CCP 2A-A
0-PMP-067-432	ERCW Pump J-A
0-PMP-067-436	ERCW Pump K-A
0-PMP-067-440	ERCW Pump L-B
0-PMP-067-444	ERCW Pump M-B
0-PMP-067-452	ERCW Pump N-B
0-PMP-067-456	ERCW Pump P-B
0-PMP-067-460	ERCW Pump Q-A
0-PMP-067-464	ERCW Pump R-A
2-PMP-3-118	MDAFW Pump 2A-A
2-PMP-3-128	MDAFW Pump 2B-B
<u>Process Instruments</u>	
2-L-003-174	Steam Generator (SG) 1 Level Loop
2-L-003-173	SG 2 Level Loop
2-L-003-172	SG 3 Level Loop
2-L-003-175	SG 4 Level Control Loop
2-L-003-164	SG 1 Level Loop
2-L-003-156	SG 2 Level Loop
2-L-003-148	SG 3 Level Loop
2-L-003-171	SG 4 Level Loop
2-XI-092-5	Source Range Flux Monitor
2-PI -1-1C	SG Pressure Loop 1
2-PI-1-8C	SG Pressure Loop 2
2-PI-1-19C	SG Pressure Loop 3
2-PI-1-26C	SG Pressure Loop 4
2-LI-68-325C	Pressurizer Level
2-LI-68-326C	Pressurizer Level
2-P-68-337C	Pressurizer Pressure
2-P-68-336C	Pressurizer Pressure
2-T-68-1C	RC Hot Leg Temperature (Loop 1)
2-T-68-24C	RC Hot Leg Temperature (Loop 2)
2-T-68-43C	RC Hot Leg Temperature (Loop 3)
2-T-68-65C	RC Hot Leg Temperature (Loop 4)
<u>Generator Controls</u>	
2-GENB-082-002A-A	EDG Emergency Start/Stop
2-GENB-082-002B-B	EDG Emergency Start/Stop

LIST OF DOCUMENTS REVIEWED

Procedures

AOP-C.04, Shutdown from Auxiliary Control Room, Rev. 23
AOP-C.04, Shutdown from Auxiliary Control Room, Rev. 24
AOP-C.04, Shutdown from Auxiliary Control Room, Rev. 25
AOP-N.01, Plant Fires, Rev. 28
AOP-N.01, Plant Fires, Rev. 29
AOP-N.01, Plant Fires, Rev. 30
AOP-N.08, Appendix R Fire Safe Shutdown, Rev. 19
AOP-N.08, Appendix R Fire Safe Shutdown, Rev. 23
EPM-7-1, EOI Administrative Controls
EPM-10, AOP-N.08 Manual Action Feasibility Study, Rev. 3
EPM-11, AOP-C.04 Manual Action Feasibility Study, Rev. 2
FPDP-4, Fire Emergency Response, Rev. 1
MMTP-102, Erection of Scaffolding/Temporary Work Platforms and Ladders, Rev. 6
NPG-SPP-07.1, On-Line Work Management, Rev. 2
NPG-SPP-09.3, Plant Modification and Engineering Change Control, Rev. 1
NPG-SPP-10.0, Plant Operations, Rev. 4
NPG-SPP-17.3-3, Fleet Fire Brigade Training TPD-FBR Training Program Description, Rev. 0
NPG-SPP-17.16, Conduct and Evaluation of Fire Drills, Rev. 0
NPG-SPP-18.3, Emergency Preparedness, Rev. 0
NPG-SPP-18.3.1, Severe Accident Management Guideline (SAMG) Program Administration
NPG-SPP-18.4.6, Control of Fire Protection Impairments, Rev. 0
NPG-SPP- 18.4.7, Control of Transient Combustibles, Rev. 0
NPG-SPP-18.4.8, Control of Ignition Sources (Hot Work), Rev. 0
OPDP-1, Conduct of Operations, Rev. 16
SOI-26-2, Fire Interaction Manual, Rev. 7
SQN-DC-V-7.5, Fire Protection Systems, Rev. 5
SQN-DC-V-10.7, Detailed Design Criteria for 10 CFR 50, Appendix R Type II and III Circuits
SQN-DC-V-13.9.9, Component Cooling Water System, Rev. 22
SQN-DC-V-24.0, Fire Protection for Appendix R Requirements, Rev. 7
SQN-DC-V-28.2, Design Criteria Sound Powered Telephone System, Rev. 1
SQN-DC-V-28.4, UHF/VHF Radio System, Rev. 3
SSI-7.1, Central and Secondary Alarm Stations, Rev. 19
0-PI-FPU-026-001.Q, Periodic Inspection and Operation of the Black Out Diesel Pump, Rev. 2
0-PI-FPU-049-401.M, Self Contained Breathing Apparatus, Rev. 28
0-PI-FPU-317-537.Q, Fire and Medical Emergency Equipment, Rev. 15
0-PI-FPU-317-538.0, Equipment Inventory, Rev. 7
0-PI-FPU-317-302.M, Monthly Pumper Inspection, Rev. 8
0-PI-MS-317-402.0, Accident Mitigation Actions Inventory of Equipment, Rev. 8
0-PI-OPS-000-027.0, Monthly AOP-C.04 (EOI) Cabinet Inventory
0-PI-OPS-000-708.0, 10 CFR Appendix R Compliance Verification, Rev. 15
0-SO-202-3, 6900V Unit Station Service Boards, Revision 31
2-SO-3-2, Auxiliary Feedwater System, Rev. 38

Calculations, Analyses, Design Changes, and Evaluations

B87-930927-034, Combustible Loading Calculation for Room 690.0-A.01, Rev. 1
B87-930927-003, Combustible Loading Calculation for Room 669.0-A.01, Rev. 2

SQN- APPR3, Electrical Fields in the Appendix R Database, Attachment T, Rev. 14
 SQN-26-D054/EPM-ABB-IMPFHA, Sequoyah Nuclear Plant - Fire Hazards Analysis
 Calculation, Rev. 61
 SQN-26-D054/EPM-ABB-IMPFHA, SQN Fire Hazards Analysis Calculation-Fire Area FAC-012
 SQN-26-D054/EPM-ABB-IMPFHA, SQN Fire Hazards Analysis Calculation-Fire Area FAA-029
 SQN-26-D054/EPM-ABB-IMPFHA, SQN Fire Hazards Analysis Calculation-Fire Area FAA-054
 SQN-26-D054/EPM-ABB-IMPFHA, SQN Fire Hazards Analysis Calculation-Fire Area FAA-081
 SQN-77-D053/2-M2-MVL-063085-4, Appendix R Drainage, Rev. 2 dated 06-28-1989
 SQN-77-D053/2-M2-MVL-063085-3, Appendix R Drainage, Rev. 2 dated 08-03-1989
 MQD-000-026-2006-165, Fire Protection Evaluation Fire Areas FAA-095 and FAA-107, Rev. 1
 DCN D22408, Modify Auxiliary and Control Building Sprinkler Systems to Comply with NFPA 13
 GDCN12475, 480V Shutdown Board Room 2B2 Fire Detector Installation
 GL 96-10 Evaluation, Sprinkler System Evaluations for TVA Sequoyah Nuclear Plant
 GL 86-10 Evaluation, Worley Parsons Project Number 50201501 dated 03/11/2010
 TVA Spec G-98, Installations and Modifications of Electrical Raceway Fire Barrier Systems

Drawings

1, 2-45N700-1, Key Diagram 120V AC & 125V DC Vital Plant Control Power System, Rev. 40
 1, 2-15E500-1, Key Diagram Station Auxiliary Power System, Rev. 31
 1, 2-15E500-2, Key Diagram Station Auxiliary Power System, Rev. 13
 1, 2-45N744-1, Wiring Diagrams 480V Aux Building Com MCC A Single Line, Rev. 11
 1, 2-45N765-6, Wiring Diagrams 6900V Shutdown Aux Power Schematic Diagram,
 Sh. 6, Rev. 35
 1, 2-45N765-15, Wiring Diagrams 6900V Shutdown Aux Power Schematic Diagram,
 Sh.15, Rev. 24
 1, 2-45N767-5, Wiring Diagrams 6900V Diesel Generators Schematic Diagram, Sh. 5, Rev. 15
 1, 2-45N779-23, Wiring Diagram 480V Shutdown Aux Power Schematic Diagram,
 Sh. 23, Rev. 37
 2-45N2637-2, Wiring Diagrams Aux Control Board – Panel 2-L-10 Connection Diagrams,
 Sh. 2, Rev. 1
 2-45N2637-1, Wiring Diagram Aux Control Board – Panel 2-L-10 Connection Diagrams,
 Sh. 1, Rev. 3
 2-45N2637-7, Wiring Diagrams Aux Control Board –Panel 2-L-10 Connection Diagram,
 Sh. 7, Rev. 1
 2-45E890-214-3, 10 CFR 50 Appendix R ST-GEN Inventory Control OPR and Spurious
 Cables Keys 11, 12, 13, 14, 115 & 16, Rev. 1
 1-45E890-204-3, 10 CFR 50 Appendix R SG Inventory Control OPR and Spurious
 Cables Keys 11, 12, 13, 14, 115 & 16, Rev. 0
 1-45E890-104-3, 10 CFR 50 Appendix R RCS Pressure Control Operational & Spurious
 CA Keys 1, 2, 4 5, 6 & 9, Rev. 0
 1, 2-45E890-994-3, 10 CFR 50 Appendix R Cold Shutdown OPR and Spurious Cables
 Keys 30, 31, & 40, Rev. 1
 2, 45E890-114-3, 10 CFR 50, Appendix R RCS Inventory Control Operational &
 Spurious CA Keys 1, 2, 4, 5, 6, & 9, Rev. 6
 1, 2-45E890-994-1, 10 CFR 50 Appendix R Cold Shutdown OPR and Spurious Cables
 Keys 30, 31, & 40, Rev. 1
 2-45E890-114-1, 10 CFR 50 Appendix R RCS Inventory Control Operational and
 Spurious CA Keys 1, 2, 4, 5, 6, & 9, Rev. 2
 1-45E890-104-1, 10 CFR 50 Appendix R RCS Pressure Control Operational and
 Spurious CA Keys 1, 2, 4, 5, 6, & 9, Rev. 4

- 2-45E890-214-1, 10 CFR 50 Appendix R ST-GEN Inventory Control OPR and Spurious Cables Keys 11, 12, 13, 14, 15 & 16, Rev. 4
- 1-45E890-204-1, 10 CFR 50 Appendix R SG Inventory Control OPR and Spurious Cables Keys 11, 12, 13, 14, 15, & 16, Rev. 4
- 1, 2-47W200-7, Equipment Plan – EL 727.5, EL 706.0, EL 663.0 and EL 643.0, Rev. 0
- 1-45E890-105-1, 10 CFR 50 Appendix R RCS Inventory Control Operational & Spurious Cables Keys 1, 2, 4, 5, 6, & 9, Rev. 0
- 1, 2-45E890-995-1, 10 CFR 50 Appendix R Cold Shutdown OPR and Spurious Cables Keys 30, 31, 40, Rev. 1
- 2-45E890-115-3, 10 CFR 50 Appendix R RCS Inventory Control Operational & Spurious CA Keys: 1, 2, 4, 5, 6, & 9, Rev. 0
- 1, 2-47W200-6, Equipment Plan EL 669.0 & EL 662.5, Rev. 5
- 1, 2-47W491-21, Mechanical Fire Protection, Rev. 3
- 1, 2-47W803-2, Flow Diagram Auxiliary Feedwater, Rev. 64
- 1-47W809-1, Flow Diagram Chemical & Volume Control System, Rev. 75
- 1-47W811-1, Flow Diagram Safety Injection System, Rev. 72
- 1, 2-47W813-1, Flow Diagram Reactor Cooling System, Rev. 54
- 1, 2-45N744-1, Wiring Diagrams 480V Aux Building Com MCC A Single Line, Rev. 11
- 1, 2-45E890-996, 10 CFR 50 Appendix R Cold Shutdown Operational & Spurious Cables Keys 30, 31, & 40, Rev. 1
- 1, 2-45E890-995-3, 10 CFR 50 Appendix R Cold Shutdown OPR and Spurious Cables Keys 30, 31, & 40, Rev. 1
- 1, 2-45E890-995-2, 10 CFR 50 Appendix R Cold Shutdown OPR and Spurious Cables Keys 30, 31, & 40, Rev. 1
- 1, 2-45E890-995-4, 10 CFR 50 Appendix R Cold Shutdown OPR and Spurious Cables Keys 30, 31, & 40, Rev. 1
- 1, 2-47W200-5, Equipment Plan EL 690.0 & EL 685.0, Rev. 6
- 1-47W610-68-5, Mechanical Control Diagram Reactor Coolant System, Rev. 22
- 45N880-4, Conduit & Grounding Cable Trays Plan EL 706.0, Rev. 6
- 45N880-5, Conduit & Grounding Cable Trays Plan EL 706.0, Rev. 10
- 45N880-7, Conduit & Grounding Cable Trays EL 706.0 Plan & Details, Rev. H
- 45W828-22, Aux Building Units 1 & 2 Conduit & Grounding Floor 734.0 Details Sht. 12, Rev. 0
- 1, 2-47W200-3, Powerhouse Units 1 & 2, Equipment Plan-EI 734.0 & 732.0, Rev. 8
- 1, 2-47W200-4, Powerhouse Units 1 & 2, Equipment Plan-EI 690.0 & 685.0, Rev. 8
- 1, 2-47W200-5, Powerhouse Units 1 & 2, Equipment Plan-EI 714.0 & 706.0, Rev. 6
- 1,2-47W491-4-1, Auxiliary Building Units 1 & 2, Mechanical, Service Air, Fire Prot & Primary Water Makeup, Rev. 1
- 1, 2-47W491-21, Auxiliary Building Units 1 & 2, Mechanical Fire Protection, Rev. 3
- 1, 2-47W491-22, Powerhouse Units 1 & 2, Mechanical Fire Protection, Rev. 2
- 1, 2-47W491-28, Auxiliary Building Units 1 & 2, Mechanical Fire Protection, Rev. 2
- 1, 2-47W491-29, Powerhouse Auxiliary Building Units 1 & 2, Mechanical Fire Protection, Rev. 4
- 1, 2-47W494-3, FP Compt. - Fire Cells, Liq. Piping-Press. Ret. Bdy. Plan El. 706 & 714, Rev. 9
- 1, 2-47W494-4, FP Compt. - Fire Cells, Liq. Piping - Press. Ret. Bdy. Plan El. 734, Rev. 8
- 1, 2-47W494-6, Control & Turb Bldg Units 1&2 FP Compt.-Fire Cells, Plan El. 669 & 685, Rev. 5
- 1, 2-47W494-7, Control & Turb Bldg Units 1&2 FP Compt.-Fire Cells, Liq. Piping-Press. Ret. Bdy Plan El. 706 & 732, Rev. 8
- 1, 2-47W600-246, Powerhouse Units 1 & 2 Mechanical Instruments & Controls, Rev. 7
- 1, 2-47W600-248, Powerhouse Units 1 & 2 Mechanical Instruments & Controls, Rev. 10
- 1, 2-47W600-254, Powerhouse Units 1 & 2 Mechanical Instruments & Controls, Rev. 2
- 1, 2-47W850-9, Powerhouse Units 1 & 2 Flow Diagram Fire Protection, Rev. 23
- 1, 2-47W850-27, HPFP Pumping Station Units 1 & 2 Mechanical Flow Diagram HPFP, Rev. 7

1,2-47W843-1, Powerhouse Units 1&2 Flow Diagram CO2 Storage, FP & Purging Sys, Rev. 14
 2-47W491-4, Aux & Control Bldg Units 1&2 Mechanical Service Air, Water, Fire Prot & Primary
 Water Makeup, Rev. 1

BD-K30 Attach. Sheet 14, R1, 1-FCV-63-72 Block Diagram

BD-K30 Attach. Sheet 15, R1, 2-FCV-63-72 Block Diagram

BD-K30 Attach. Sheet 17, R1, 2-FCV-63-73 Block Diagram

BD-K30 Attach. Sheet 16, R1, 1-FCV-63-73 Block Diagram

Sheet BD-K34-11, Checked 10/19/84, 2-FCV-62-90 Block Diagram

Sheet BD-K34-12, R2, Checked 10/30/01, 2-FCV-62-91 Block Diagram

Sheet BD-K2-2, R2, Checked 11/8/01, 2-FCV-63-93 Block Diagram

Sheet BD-K1-18, R9, Checked 2/10/09, 2-PMP-62-104 Block Diagram

Sheet BD-K1-2, R9, Checked 2/10/09, 2-PMP-62-108 Block Diagram

Sheet BD-K3-001, Checked 4/10/09, 0-PMP-67-432 Block Diagram

Sheet BD-K3-002, Checked 5/15/09, 0-PMP-67-436 Block Diagram

Sheet BD-K3-005, Checked 4/10/09, 0-PMP-67-440 Block Diagram

Sheet BD-K3-006, Checked 4/10/09, 0-PMP-67-444 Block Diagram

Sheet BD-K3-007, Checked 4/10/09, 0-PMP-67-452 Block Diagram

Sheet BD-K3-008, Checked 4/10/09, 0-PMP-67-456 Block Diagram

Sheet BD-K3-003, Checked 5/15/09, 0-PMP-67-460 Block Diagram

Sheet BD-K3-004, Checked 4/10/07, 0-PMP-67-464 Block Diagram

Sheet BD-K11-003, R2, Checked 2/10/09, 2-PMP-3-118 Block Diagram

Sheet BD-K11-004, R2, Checked 2/10/09, 2-PMP-3-128 Block Diagram

Sheet BD-K38&39-003, Checked 1/11/02, DG 2A-A Emergency Start Block Diagram

Sheet BD-K38&39-007, Checked 1/11/02, DG 2A-A Emergency Stop Block Diagram

Sheet BD-K38&39-004, Checked 1/11/02, DG 2B-B Emergency Start Block Diagram

Sheet BD-K38&39-008, Checked 1/11/02, DG 2B-B Emergency Stop Block Diagram

Completed Surveillance Procedures, Test Records, & Work Orders (WO)

0-PI-FPU-317-538.0, Appendix R Equipment Inventory, Rev. 0007, Completed 9/30/2010

1-PI-OPS-000-010.A, Verification of Remote Shutdown Transfer Switches, Rev. 7, Completed
 11/2/07

1-PI-OPS-000-010.B, Verification of Remote Shutdown Transfer Switches, Rev. 7, Completed
 6/29/09

2-PI-OPS-000-010.A, Verification of Remote Shutdown Transfer Switches, Revision 3,
 Completed 6/24/08

2-PI-OPS-000-010.B, Verification of Remote Shutdown Transfer Switches, Revision 4,
 Completed 11/21/09

0-SI-FPU-247-004.0, Auxiliary Building Appendix R Emergency Lighting Discharge Test,
 Completed January 2009

0-SI-FPU-247-004.0, Auxiliary Building Appendix R Emergency Lighting Discharge Test,
 Completed July 2010

Fire Drill #: FPT 218.300, Aux-0-669-02, Unit 2 End of Aux. Elevation 669, 10/02/2003

Fire Drill #: FPT 218.300, Aux-0-669-02, Unit 2 End of Aux. Elevation 669, 09/23/2003

Fire Drill #: FPT 218.300, Aux-0-669-02, Unit 2 End of Aux. Elevation 669, 09/22/2003

Fire Drill #: FPT 218.300, Aux-0-669-02, Unit 2 End of Aux. Elevation 669, 09/25/2003

TVA-35A Rev. 2 Pre-Operation Test Deficiency Report, Powerhouse CO2 Fire Protection
 System Unit 1 & 2, 02-14-80

SI-237.1, Powerhouse CO2 Fire Protection System Test, Rev. 30, 10-05-2010

0-SI-FPU-013-610.0, Fire Detection Panel, 0-L-610.0, Rev. 5, 01-23-2009

0-SI-FPU-013-610.0, Fire Detection Panel, 0-L-610.0, Rev. 5, 07-21-2009

0-SI-FPU-013-610.0, Fire Detection Panel, 0-L-610.0, Rev. 5, 01-20-2010
 0-SI-FPU-013-610.0, Fire Detection Panel, 0-L-610.0, Rev. 5, 07-20-2010
 0-SI-FPU-013-611.0, Fire Detection Panel, 0-L-611.0, Rev. 4, 02-03-2009
 0-SI-FPU-013-611.0, Fire Detection Panel, 0-L-611.0, Rev. 4, 07-29-2009
 0-SI-FPU-013-611.0, Fire Detection Panel, 0-L-611.0, Rev. 4, 02-01-2010
 0-SI-FPU-013-611.0, Fire Detection Panel, 0-L-611.0, Rev. 4, 07-27-2010
 0-SI-FPU-013-613.0, Fire Detection Panel, 0-L-613.0, Rev. 5, 03-17-2009
 0-SI-FPU-013-613.0, Fire Detection Panel, 0-L-613.0, Rev. 5, 09-25-2009
 0-SI-FPU-013-613.0, Fire Detection Panel, 0-L-613.0, Rev. 5, 03-19-2009
 0-SI-FPU-013-613.0, Fire Detection Panel, 0-L-613.0, Rev. 5, 09-14-2009
 0-SI-FPU-013-618.0, Fire Detection Panel, 0-L-618.0, Rev. 6, 03-10-2009
 0-SI-FPU-013-618.0, Fire Detection Panel, 0-L-618.0, Rev. 6, 09-25-2009
 0-SI-FPU-013-618.0, Fire Detection Panel, 0-L-618.0, Rev. 6, 03-17-2010
 0-SI-FPU-013-618.0, Fire Detection Panel, 0-L-618.0, Rev. 6, 09-24-2010
 0-SI-FPU-013-624.0, Fire Detection Panel, 0-L-624.0, Rev. 6, 01-22-2009
 0-SI-FPU-013-624.0, Fire Detection Panel, 0-L-624.0, Rev. 6, 07-17-2009
 0-SI-FPU-013-624.0, Fire Detection Panel, 0-L-624.0, Rev. 6, 01-22-2010
 0-SI-FPU-013-624.0, Fire Detection Panel, 0-L-624.0, Rev. 6, 07-16-2010
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 01-11-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 02-07-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 03-07-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 04-08-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 05-04-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 06-01-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 06-23-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 4, 07-28-2009
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 5, 01-24-2010
 0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 5, 07-25-2010
 0-SI-FPU-026-190.Q, Accessible Fire Hose Station Visual Inspection, Rev. 2, 03-07-2010
 0-SI-FPU-026-190.Q, Accessible Fire Hose Station Visual Inspection, Rev. 2, 06-06-2010
 0-SI-FPU-026-190.Q, Accessible Fire Hose Station Visual Inspection, Rev. 3, 09-05-2010
 0-SI-FPU-026-192.M, Motor Driven Fire Pump A Operability Test, Rev. 3, 01-21-2011
 0-SI-FPU-026-241.R, Visual Inspection of the Fire Protection Sprinkler Systems in the Auxiliary Building, Rev. 4, 01-21-2009
 0-SI-FPU-026-241.R, Visual Inspection of the Fire Protection Sprinkler Systems in the Auxiliary Building, Rev. 4, 04-13-2009
 0-SI-FPU-026-241.R, Visual Inspection of the Fire Protection Sprinkler Systems in the Auxiliary Building, Rev. 4, 07-24-2010
 0-SI-FPU-031-001.R, Visual Inspection of Fire Dampers, Rev. 6, 08-14-2009
 0-SI-FPU-302-003.R, Fire Barrier Visual Inspection - Control Building, Rev. 5, 08-29-2009
 0-SI-FPU-302-003.R, Fire Barrier Visual Inspection - Auxiliary Building Elevation 706 ft. and Above, Rev. 4, 10-04-2009
 0-SI-FPU-302-007.R, Visual Inspection of Electrical Raceway Fire Barrier Systems, Rev. 7, 04-24-2009
 0-PI-FPU-317-530.Q, Plant Operating Area Fire Extinguisher Quarterly Inspection, Rev. 11, 01-24-2010
 0-PI-FPU-317-530.Q, Plant Operating Area Fire Extinguisher Quarterly Inspection, Rev. 11, 04-26-2010
 0-PI-FPU-317-530.Q, Plant Operating Area Fire Extinguisher Quarterly Inspection, Rev. 11, 07-25-2010
 0-PI-FPU-317-530.Y, Plant Operating Area Fire Extinguisher Annual Inspection,

Rev. 10, 10-26-2010
 WO 08-776996-000, Blackout Pump setup
 WO 08-777635-000 Relocation and Replacement of Smoke Detector 0-XS-13-15D
 WO 08-777986-000 Relocation and Replacement of Smoke Detector 0-XS-13-15A

Applicable Codes, Specifications, & Standards

NFPA 12-1973, Standard on Carbon Dioxide Extinguishing Systems
 NFPA 13-1975, Standard for the Installation of Sprinkler Systems
 NFPA 13-2007, Standard for the Installation of Sprinkler Systems
 NFPA 72E-1974, Standard for the Installation, Maintenance, and use of Protective Signaling Systems

Technical Manuals & Vendor Information

MSDS 775739, Material Safety Data Sheet for Conoco Hydroclear Turbine Oil Plus 32, 46, 68, 100
 Royal Purple, Ltd. Material Safety Data Sheet for Synfilm® GT
 SQN-VTD-G077-0060, Vendor Technical Document for Gamma-Metrics Optical Isolator Signal Splitter Cards Manufactured After 09/13/1994, Rev. 0
 SQN-VTD-G080-0260, Instructions For Type 550 Millivolt-To-Current (MV/I) Transmitter, Rev. 2

Audits & Self-Assessments

SQN-ENG-F-10-14, Full Focused Programmatic Fire Protection/Appendix R Self Assessment, dated 7/19-23/2010
 Gap Analysis of Licensing Bases and Fire Protection Reports for SQN and WBN, dated 12/2010

License Basis Documents

Sequoyah Nuclear Plant Fire Protection Report, Rev. 27
 Sequoyah Nuclear Plant Updated Final Safety Analysis Report Revision 20
 NUREG-0011, Supplements 1, 2, and 5, Related to the Operation of Sequoyah Nuclear Plants Units 1 and 2
 NUREG-1232, Volume 2, Safety Evaluation Report on Tennessee Valley Authority: Sequoyah Nuclear Performance Plan, dated May 1988
 Letters from NRC to TVA, dated May 29, 1986, and October 6, 1986
 NRC Safety Evaluation issued on August 12, 1997, for License Amendment No. 218

Other Documents

NRC Inspection Report Nos. 50-327/88-24 and 50-328/88-24
 NRC Inspection Report Nos. 50-327/88-37 and 50-328/88-37
 NRC Regulatory Guide 1.189, Fire Protection for Nuclear Power Plants, Rev. 2, dated 10/2009
 NRC Regulatory Issue Summary 2006-10, Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions
 LER 2009-001-00, Appendix R Unanalyzed Condition Affecting Safety Related Shutdown Boards
 Shift Staffing Report, 7/25/2008
 Shift Staffing Report, 6/29/2009
 Shift Staffing Report, 11/11/2010

Standing Order SO-11-02, Revisions to AOP-C.04 and AOP-N.01, Rev. 2
 Fire Drill Critique Report #FPT218.510, 01/22/2009 (Unannounced)
 Fire Drill Critique Report #FPT218.100, 02/05/2009
 Fire Drill Critique Report #FPT218.100, 02/16/2009
 Fire Drill Critique Report #FPT218.100, 03/06/2009
 Fire Drill Critique Report #FPT218.200, 05/19/2009
 Fire Drill Critique Report #FPT218.520, 05/19/2009 (Unannounced)
 Fire Drill Critique Report #FPT218.200, 05/29/2009
 Fire Drill Critique Report #FPT218.200, 06/11/2009
 Fire Drill Critique Report #FPT218.400, 08/06/2009 (Unannounced)
 Fire Drill Critique Report #FPT218.530, 09/03/2009 (Unannounced)
 Fire Drill Critique Report #FPT218.530, 09/22/2009 (Unannounced)
 Fire Drill Critique Report #FPT218.300, 09/28/2009
 Fire Drill Critique Report #FPT218.350, 11/05/2009
 Fire Drill Critique Report #FPT218.400, 11/26/2009
 Fire Drill Critique Report #FPT218.400, 11/30/2009
 Fire Drill Critique Report #FPT218.400, 12/23/2009
 Fire Drill Critique Report #FPT218.510, 02/24/2010 (Unannounced)
 Fire Drill Critique Report #FPT218.510, 03/04/2010 (Unannounced)
 Fire Drill Critique Report #FPT218.510, 03/11/2010
 Fire Drill Critique Report #FPT218.510, 03/24/2010
 Fire Drill Critique Report #FPT218.200, 04/20/2010 (Unannounced)
 Fire Drill Critique Report #FPT218.200, 06/03/2010
 Fire Drill Critique Report #FPT218.520, 06/04/2010
 Fire Drill Critique Report #FPT218.200, 06/08/2010
 Fire Drill Critique Report #FPT218.530, 07/21/2010 (Unannounced)
 Fire Drill Critique Report #FPT218.300, 07/29/2010
 Fire Drill Critique Report #FPT218.300, 09/02/2010
 Fire Drill Critique Report #FPT218.300, 09/14/2010
 Fire Drill Critique Report #ATIS 12430, 11/30/2010
 Fire Drill Critique Report #ATIS 0012430, 11/30/2010
 Fire Drill Critique Report #ATIS 00076630, 12/01/2010 (Unannounced)
 Fire Drill Critique Report #ATIS 00076090, 12/14/2010 (Off-Site)
 PFP No.: CON-0-685-00, Fire Protection Pre-Fire Plans Control Building Elevation 685, Rev. 5
 PFP No.: AUX-0-714-01, Fire Protection Pre-Fire Plans Auxiliary Building Elevation 714, Rev. 6
 PFP No.: AUX-0-734-02, Fire Protection Pre-Fire Plans Auxiliary Building Elevation 734, Rev. 6
 PFP No.: AUX-0-749-01, Fire Protection Pre-Fire Plans Auxiliary Building Elevation 749, Rev. 6
 SPP 10.11-1, TVAN Hot Work Permit #1110003140 (Hot Work in Cable Spreading Room)
 Fire Protection Impairment Tracking Log (Systems Out-of-Service 11-16-2010 to 01-27-2011)
 Fire Protection Impairment Permit FOR080183 (Valve 0-FCV-26-211 isolated for DCN 22408)
 Fire Protection Impairment Permit FOR100454
 Fire Protection Impairment Permit FOR110019
 Fire Protection Program Change Regulatory Review (FPPCRR) for AOP-C.04, Rev. 24
 FPPCRR for AOP-C.04, Rev. 25
 FPPCRR for AOP-N.01, Rev. 30
 FPPCRR for AOP-N.08, Rev. 23
 Penetration No. A17724F023, Fire Area FAA 054-A01 Elevation 714 Detail Type A32
 SQN SER-3-98, Fire Protection System Water Hammer
 Tennessee Valley Authority (TVA) Contract No. 50068, Supplement No. 4 between the Soddy
 Daisy Fire Department and TVA, effective November 3, 2010 through December 31, 2014

List of Problem Evaluation Reports (PERs) Reviewed During the Inspection

PER 02-003645, NRC identified Green NCV during 2002 TFPI for use of OMAs in lieu of cable protection
 PER 02-000576, Licensee identified NCV for failure to protect SSD cables and equipment
 PER 92639, Fire Area FAA-095 Appendix R Deviations
 PER 96224, Degraded Condition - Scaffold Blocking Cable Spreading Room Fire Suppression
 PER 109269, Response to NRC RIS 2006-10
 PER 116718, Appendix R Separation and Combustibles
 PER 129012, Lack of time limits for MCR fire safe shutdown actions
 PER 129492, Generic review of Browns Ferry PER 122729
 PER 129585, Communications system not adequately addressed in App R fire safe shutdown
 PER 129598, Appendix R manual action feasibility challenges
 PER 129599, Appendix R manual actions which depend on fire location
 PER 129611, Appendix R lighting deficiencies
 PER 129656, Appendix R manual action feasibility documentation
 PER 129658, Appendix R manual actions involving motor-operated valves
 PER 145212, Appendix R Safe Shutdown Deficiencies
 PER 147062, Sprinkler Deficiencies in Aux Bldg
 PER 147263, 480V Shutdown Board Room 2B2 Fire Detector Installation
 PER 147467, NFPA 2008 TFPI Spreading Room Issue
 PER 152542, Refresher training for fire operations personnel
 PER 152677, Refresher training for security/support staff
 PER 153291, Refresher training for licensed operators
 PER 154316, Portable diesel pump questions
 PER 154344, Steam generator flow requirements
 PER 162189, Potential Unanalyzed Condition Affecting 6900V Shutdown Boards
 Not Being Performed
 PER 162657, Appendix R Battery Powered Emergency Lights
 PER 201169, Fire Drill Lessons Learned
 PER 229945, Emergency Battery Powered Light Failure Rate Trend
 PER 233889, Evaluate the Elimination of Low Pressure CO2 Fire Suppression
 PER 245204, Appendix R-180 Blocked by a Scaffold
 PER 245206, Appendix R light 0-LGT-247-R180 was blocked by a scaffold
 PER 246617, Spurious PORV opening during Appendix R fire
 PER 248623, Scaffolding Affecting Fire Protection Spray Pattern
 PER 259628, Adverse trend of PERs associated with scaffolding
 PER 270216, Oil leak on RCP 1-3
 PER 305411, Operator manual action reduction efforts
 PER 305417, NUENERGY Gap Analysis of Licensing Bases and Fire Protection Reports
 PER 305829, Appendix R operator manual actions
 PER 305832, Reconstitute fire protection licensing basis for SQN
 PER 305836, SQN fire protection license basis – resolution of OAs/OMAs
 PER 306119, Evaluate need for fire protection program change process training
 PER 306435, Issue identified in App R licensing basis Gap Analysis regarding spurious SI
 PER 306437, Issue identified in App R licensing basis Gap Analysis regarding SI reset
 PER 306439, Issue identified in App R licensing basis Gap Analysis regarding VCT isolation
 PER 306451, Issue identified in App R licensing basis Gap Analysis regarding VCT valve
 PER 306453, Issue identified in App R licensing basis Gap Analysis regarding cumulative impact of multiple changes to AOP-N.01 not being evaluated

PER 306465, Issue identified in App R licensing basis Gap Analysis regarding calc SQS2-0127
 PER 306470, Issue identified in App R licensing basis Gap Analysis related to PER 139981
 PER 307412, Fire protection licensing bases discrepancies
 PER 307531, Fire Protection Report, Part X deficiencies
 PER 307538, Untimely corrective action implementation for PER 147467-FP sprinklers

List of Service Requests (SRs) and/or PERs Generated as a Result of This Inspection

SR 313505/PER 314437, Conflict between EDMG-2 and NEI 06-12 Guidance
 SR 314186/PER 315139, Spent fuel pool fuel dispersal and cooling during a B.5.b event
 SR 314474/PER 315720, Emergency fire equipment partially blocked
 SR 314680/PER 315732, Inadequate procedure for catastrophic event impacting spent fuel pool
 SR 314717/PER 315746, SQN does not have a process to review potential impact to B.5.b action times if a piece of equipment is temporarily relocated
 SR 314843/PER 315750, RP personnel have not received specific B.5.b training
 SR 315085/PER 315775, Concern that some B.5.b equipment is within 100 yards of target area
 SR 315226/PER 316812, Door chock found in Unit 1 Aux Instrument Room
 SR 315333/PER 316839, No hydraulic calc performed for DCN for cable spreading room
 SR 315349/PER 316842, AUOs failing to log when assuming the shift in ESOMS
 SR 315506/PER 316859, B.5.b procedure improvements
 SR 315607/PER 317974, Gloves found inside Aux Building cable tray
 SR 316421/PER 317415, B.5.b operator knowledge needs improvement
 SR 316637/PER 317443, Partially obstructed sprinkler head
 SR 317651/PER 318609, Pages missing from completed PI package
 SR 318253/PER 319165, FPDP-4 potentially conflicts with AOP-N.01
 SR 318302/PER 319168, Minor error in AOP-C.04
 SR 318808/PER 320287, PER 250666 did not adequately address operator action time limits
 SR 319988/PER 320868, App R manual action feasibility study needs more travel path info
 SR 320217/PER 320905, Some operations personnel unable to pass through door C49
 SR 320791/PER 321476, App R calc references wrong pressure indication
 SR 321015/PER 321888, Lack of documentation on feasibility/reliability of App R manual action
 SR 321151/PER 321911, Scaffold obstructed sprinkler system without an impairment permit
 SR 321177/PER 321920, Apparent unnecessary work included in DCN
 SR 321198/PER 323545, Vent duct support may be cracked
 SR 321820/PER 322638, Possible weakness performing operability evaluations for App R lights
 SR 321846/PER 322641, Inadequate screening review for fire related procedure change
 SR 322401/PER 323596, Typographical error in AOP-N.08 (Appendix R Fire Safe Shutdown)
 SR 323131/PER 324757, NRC URI on operator manual actions used in lieu of protecting cables
 SR 328003/PER 328960, Information provided late for triennial fire protection inspection

LIST OF ACRONYMS AND ABBREVIATIONS

AB	Auxiliary Building
AOP	Abnormal Operating Procedure
APCSB	Auxiliary and Power Conversion Systems Branch
BTP	Branch Technical Position
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CB	Control Building
DC	Direct Current
DCN	Design Change Notice
ELU	Emergency Lighting Unit
ERFBS	Electrical Raceway Fire Barrier System
FA	Fire Area
FHA	Fire Hazard Analysis
FIN	Finding
FPR	Fire Protection Report
FPP	Fire Protection Program
FSAR	Final Safety Analysis Report
ft	feet/foot
gpm	Gallons Per Minute
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IR	Inspection Report
LER	Licensee Event Report
MCR	Main Control Room
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	United States Nuclear Regulatory Commission
NUREG	An explanatory document published by the NRC
OLC	Operating License Condition
OMA	Operator Manual Action
PER	Problem Evaluation Report
Rev	Revision
Rm	Room
SDP	Significance Determination Process
SER	Safety Evaluation Report
sq. ft.	Square Feet
SQN	Sequoyah Nuclear Plant
SR	Service Request
SSD	Safe Shutdown
TFPI	Triennial Fire Protection Inspection
TVA	Tennessee Valley Authority
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item