Sequoyah Triennial Fire Protection Inspection
IP 71111.05T (March 23, 2001)

March 25-29, 2002

Sequoyah Triennial Fire Protection Inspection

Team Composition

- Team Leader - Eva Brown: Resident Inspector -Brunswick
- *Reactor /Mechanical Systems* Inspector - McKenzie Thomas: Senior Reactor Engineer
- Electrical Inspector - Paul Fillion: Reactor Engineer
- Fire Protection Inspector - Gerry Wiseman: Senior Reactor Engineer

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Inspection Schedule

- Bagman - February 28 - March 1, 2002
- Preparation Week - March 18 -22, 2002
- Onsite Inspection - March 25-29, 2002
- Documentation - April 1 - 5, 2002
- Report required issued - 45 days from end of inspection

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Fire Area Selected

- Fire Area FAA-029, Auxiliary Building, Elevation 690: Auxiliary Building Corridor
- Fire Area FAA-067, Auxiliary Building, Elevation 734: 6.9kilovolt (kV) and 480 volt (V) Shutdown Board Room
- Fire Area FAC-009, Control Building, Elevation 685: Unit 1 Auxiliary Instrument Room
- Fire Area FAC-20, Control Building, Elevation 732: Relay Room

Not just top 4 risk significant areas. Based on SRI, SRA and FP insp. inputs.

NN-35

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Inspection Findings

- Green Finding
  - Inadequate relay coordination for the Common Service Station Transformer
- Two Non-cited Violations (NCVs)
  - Inadequate Plant Fire procedure
  - Failure to ensure one of the redundant trains is free from fire damage (FAA-29)
- Two Licensee Identified NCVs
  - Failure to ensure one of the redundant trains is free from fire damage
  - Failure to provide adequate emergency lighting

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Inspection Issues

- One Unresolved Item (URI)
  - Credit of Control Air for Normal Letdown in FAA-80
- Eight Minor Issues
  - Minor issues were presented to the licensee and entered into their Corrective Action Program as Problem Evaluation Reports (PERs)

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Eight Minor Issues

- Incorrect Categorization of Fire Protection PERs
  - (02-02866) adverse conditions requiring outage modifications put in "broke-fix" category D
- Availability of Sound Powered Phones
  - (02-03510) FSAR credits use of sound-powered phones as backup to radios for alternate shutdown, however sound-powered phones are not present in all the locations identified in the shutdown procedure
- Shift Incident Commander Training on AOP-N.08
  - (02-03543) SIC not trained on new Main Control Room shutdown procedure

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Eight Minor Issues (cont.)

- Onshift Familiarity with Plant Fire and Appendix R Procedures
  - (02-03552) Issues with operator knowledge of plant fire and III.G.3 Shutdown Procedure
- Cardox Floor Drain Loop Seal PM
  - (02-03565) Floor drain loop seals in the Auxiliary Instrument Rooms (FAC-009) were not routine verified to be filled with water to prevent CO_2 mitigation to other plant areas
- Fire Equipment Area Emergency Lighting
  - (02-03564) Absence of lighting in Fire Brigade equipment staging area

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Eight Minor Issues (cont.)

- Fire Fighting Effects on the Performance of Electrical Equipment Manipulation
  - (02-03566) Water from fire fighting/ sprinklers could migrate into area where manual actions on energized electrical components would be required
- Lack of Procedural Steps for Cold Shutdown Repair
  - (02-03530) One procedure identified the need to perform "repair," but actual procedural step was nonexistent

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One Unresolved Item (URI)

- Credit of Control Air for Normal Letdown in FAA-80
  - failure to maintain a redundant train free from fire damage for alternate letdown. The licensee stated that "[t]he EQTS room...contains cables for all four acceptable combinations of PORVs, Block Valves, and RVHV Valves in such a manner that safe shutdown cannot be guaranteed using the Alternate Letdown Path." Normal and Excess Letdown are not available in this scenario due to the licensee not crediting control air for compliance with Appendix R
  - Licensee identified that redundant Alternate Letdown cables were not protected in accordance with Appendix R III.G.2
  - Decided to use normal letdown which credits control air
  - Some licensing information suggests no credit for control air

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Licensee Identified Non-cited Violations (4OA7)

- Inadequate Emergency Lighting for RWST Isolation Valve
  - Failure for the "...manual actions specified for the closure of valve 1,2 FCV-63-0001 did not alert the operator to the potential for requiring local manual operation of the valve. Additionally, emergency lights have not been provided for local operation." The licensee indicated that this failure could allow the contents of the RWST to drain into the containment sump.

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Licensee Identified Non-cited Violations (4OA7)

- Inadequate Protection Against Spurious Operation of VCT suction valves
  - A fire could result in a spurious closure signal to the VCT level control valves. As the power cables for the RWST suctions valves are in the same fire area and not protected "...an interaction exists such that suction to both the VCT and RWST could be lost."

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Non-cited Violation (10 CFR 50 Appendix R III.G.2)

- Failure to ensure one of the redundant trains is free from fire damage (FAA-29)
- Identified during verification of separation (EI);
- Noted inappropriate manual action (RMSI);
- Identified nonconformance(FPI).
- Similar to ANO violation issued in 50-313(368)/01-07

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Regulatory Requirements for Shutdown from the Main Control Room

- 10 CFR 50 Appendix R III.G.2
  - Except as provided for in paragraph G.3 of this section, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

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Regulatory Requirements for Shutdown from the Main Control Room

- 10 CFR 50 Appendix R III.G.2 <cont>
  - a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;

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Regulatory Requirements for Shutdown from the Main Control Room

- 10 CFR 50 Appendix R III.G.2 <cont>
  - b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
  - c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area;

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Arkansas One III.G.2 Issue

- Inspection Report issued an URI (50-313(368)/01-06
  - URI was to give extra time to deal with possible greater than green significance (August 20, 2001)
  - Region IV re-exited the URI and resolved issue as a non-cited violation of III.G.2 (August 30, 2001)
  - Region IV issues TIA to ask for assistance in determining significance (September 10, 2001)
  - Entergy letter claims NCV was backfit since NRC has tacitly approved use of manual actions (September 28, 2001)
  - Currently, letter in draft form to rebut Entergy claims and reaffirm III.G.2 violation - Letter has been through OGC, NRR, RIV, and is currently resolving editorial comments

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Non-cited Violation (10 CFR 50 Appendix R III.G.2) -Licensee's Position

- Consistency with ANO finding
- Approved in Current Licensing Basis (CLB)
  - Claims manual actions for non-spurious was approved in CLB
  - Licensee considers Inspection Report review tacit approval of entire procedure

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NEI Position on Manual Actions (III.G.2)

- NEI Licensing Forum (November 27, 2001) requests NRC FP Inspector Training Material on III.G.2 Manual Actions
- NRC Letter to NEI transmitting requested slides (November 29, 2001)
- NEI Letter to NRC (January 11, 2002)
  - "The use of manual actions to achieve safe shutdown....is acceptable, without prior approval, as long as the reliance on manual actions does not adversely affect the ability of the plant to achieve and maintain safe shutdown."

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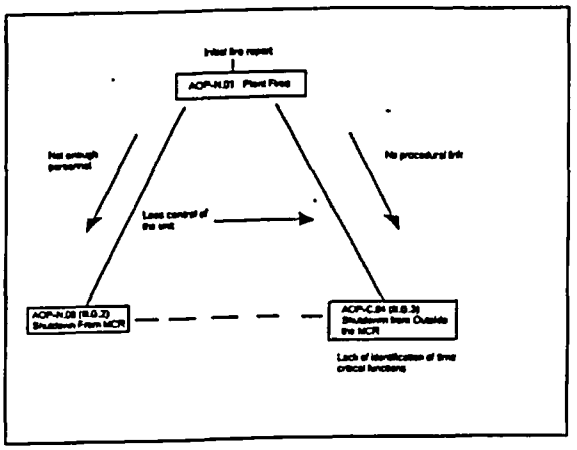
Non-cited Violation (Inadequate Plant Fire Protection Procedure)

- RMSI noted errors; questioned whether transitions would occur due to identified deficiencies
- Severe Fire Mitigation - Three procedures
  - Initial Response (AOP-N.01)
  - Shutdown from Main Control Room (AOP-N.08)
  - Shutdown from outside the Main Control Room (AOP-C.04)



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Non-cited Violation (Inadequate Plant Fire Protection Procedure)

- EI and FPI walked down FAA-29 developed fire scenario
- RMSI and Charlie Payne question onshift operators regarding scenario
- Answers revealed poor transitions between procedures (AOP-N.01 and AOP-N.08)
- Answers revealed unfamiliarity with procedure (AOP-N.08)
  - Use both sections of AOP-N.08 (Staffing 10 versus 7 AUOs)

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Non-cited Violation (Inadequate Plant Fire Protection Procedure)

- RMSI and Charlie Payne identified additional issues with AOP-C.04
  - Lack of step for transition from AOP-N.01 to AOP-C.04
  - Procedure actually required entry into AOP-N.08 to procedurally get to AOP-C.04
  - Determined that brand new procedure was validated using a "table-top" approach
  - In-plant operator walkdown was to verify proper labeling and tagging
  - No time critical actions in procedure

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Potential Finding - Initiating Events

- Coordination between the neutral overcurrent and the ground relays was not adequate
  - Increased likelihood of dual unit trip due to improper transfer of fault from one unit to the other

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Lessons Learned - Successes

- Mid-week meeting with Engineering Manager allowed licensee management to focus effort
- Operator -Licensing Inspector During Procedure Walkthrough
- Pre-inspection material provided electronically (CD)
- Daily Team Meetings
- Electrical and FP Inspector on Walkdowns

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Lessons Learned - Challenges

- Communications
- Obtaining Needed Documentation - Computer Access -Internet -Links
- Confusion on what constitutes a performance issue
- Additional Licensee Performance Issues

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Exceptional Effort

- Paul Fillion, McKenzie Thomas, Gerry Wiseman - Separation Issue
- Paul Fillion - Identification of Relay Coordination Issue
- Gerry Wiseman - Use of NRC Fire Dynamic Worksheets
  - Identified that a severe fire in the SQN Pump House would result in structural failure