



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931**

March 20, 2002

Duke Energy Corporation
ATTN: Mr. W. R. McCollum
Vice President
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

**SUBJECT: OCONEE NUCLEAR STATION - NRC INSPECTION REPORT 50-269/02-03,
50-270/02-03, AND 50-287/02-03**

Dear Mr. McCollum:

On February 8, 2002, the Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at the Oconee Nuclear Station. The enclosed report documents the results of this inspection which were discussed on February 8, 2002, with Mr. Ron Jones and other members of your staff.

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

Based on the results of this inspection, two apparent violations were identified. The first involved a failure to include an operator action to isolate an emergency feedwater valve during certain fire scenarios in the Standby Shutdown Facility (SSF) operating procedure. The second violation involved the failure to incorporate a licensing basis commitment to man the SSF upon confirmation of a fire into plant procedures. These issues have not yet been characterized by the Significance Determination Process, therefore their significance is yet to be determined.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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

DEC

2

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

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos.: 50-269, 50-270, 50-287
License Nos.: DPR-38, DPR-47, DPR-55

Enclosure: NRC Inspection Report 50-269/02-03,
50-270/02-03, 50-287/02-03 w/Attachment

cc w/encl:
Compliance Manager (ONS)
Duke Energy Corporation
Electronic Mail Distribution

Lisa Vaughn
Legal Department (PB05E)
Duke Energy Corporation
422 South Church Street
Charlotte, NC 28242

Anne Cottingham
Winston and Strawn
Electronic Mail Distribution

Mel Fry, Director
Division of Radiation Protection
N. C. Department of Environmental
Health & Natural Resources
Electronic Mail Distribution

Henry J. Porter, Director
Div. of Radioactive Waste Mgmt.
S. C. Department of Health and
Environmental Control
Electronic Mail Distribution

(cc w/encl cont'd - See page 3)

DEC

3

(cc w/encl cont'd)

R. Mike Gandy
Division of Radioactive Waste Mgmt.
S. C. Department of Health and
Environmental Control
Electronic Mail Distribution

County Supervisor of
Oconee County
415 S. Pine Street
Walhalla, SC 29691-2145

Lyle Graber, LIS
NUS Corporation
Electronic Mail Distribution

Manager
Nuclear Regulatory Licensing
Duke Energy Corporation
526 S. Church Street
Charlotte, NC 28201-0006

Peggy Force
Assistant Attorney General
N. C. Department of Justice
Electronic Mail Distribution

Distribution w/encl:

L. Olshan, NRR
C. Evans (Part 72 Only)
RIDSNRRDIPMLIPB
PUBLIC

OFFICE	RII:DRP	RII:DRS	RII:DRS	RII:DRS	BNL	RII:DRS	RII:DRP
SIGNATURE	BILLINGS	SCHIN	WISEMAN	BILLINGS FOR	SULLIVAN	PAYNE	HAAG
NAME	DBILLINGS	RSCHIN	GWISEMAN	CSMITH	KSULLIVAN	CPAYNE	RHAAG
DATE	3/5/02	3/6/02	3/5/02	3/6/02	3/5/02	3/8/2002	3/7/02
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-269, 50-270, 50-287

License Nos.: DPR-38, DPR-47, DPR-55

Report Nos.: 50-269/02-03, 50-270/02-03, 50-287/02-03

Licensee: Duke Energy Corporation

Facility: Oconee Nuclear Station, Units 1, 2, and 3

Location: 7800 Rochester Highway
Seneca, SC 29672

Dates: February 4 - 8, 2002

Inspectors: D. Billings, Oconee Resident Inspector (Lead Inspector)
R. Schin, Senior Reactor Inspector
C. Smith, Senior Reactor Inspector
K. Sullivan, Contractor, Brookhaven National Laboratory
G. Wiseman, Senior Reactor Inspector

Approved by: Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS Oconee Nuclear Station, Units 1, 2, and 3

IR 05000269-02-03, IR 05000270-02-03, and IR 05000287-02-03, on 02/4-8/2002, Duke Energy Corporation, Oconee Nuclear Station, Units 1, 2, & 3, triennial baseline inspection of the fire protection program.

The inspection was conducted by an Oconee resident inspector, three regional reactor inspectors, and one electrical contractor from Brookhaven National Laboratory. The inspection identified two apparent violations with colors yet to be determined. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process." Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://nrr10.nrc.gov/NRR/OVERSIGHT/index.html>.

Inspector Identified Findings

Cornerstone: Mitigating Systems

- To be Determined (TBD). An apparent violation was identified, in that, an operator action that was described in the Oconee licensing basis was not appropriately implemented in procedures. The licensing basis stated that, upon confirmation of a fire in the plant, operating personnel would be dispatched to the standby shutdown facility (SSF) and would establish communication with the main control room (MCR). However, plant procedures did not dispatch an operator to the SSF until a loss of function occurred.

This finding had a credible impact on safety, in that, during a cable spreading room (CSR) fire that required activation of the SSF, delaying manning of the SSF, could increase the amount of time during which the unit was vulnerable to the effects of spurious actuations. Spurious actuations could disable the SSF by causing a loss of inventory greater than the capability of the SSF reactor coolant (RC) makeup pump. The safety significance of this finding is unresolved pending further NRC evaluation. (Section 1R05.03)

- TBD. An apparent violation was identified, in that, an operator action that was required by the licensee's fire safe shutdown analysis (SSA) was not included in appropriate operating procedures. The SSA stated that, when activating the SSF to mitigate a fire, operators would manually close valve FDW-315 in the east penetration room. This action is needed to prevent a spurious actuation of an emergency feedwater (EFW) pump from disabling the SSF. However, this operator action was not included in operating procedures that would be used for responding to a control room fire with evacuation of the control room and activation of the SSF.

This finding had a credible impact on safety, in that, failure to shut valve FDW-315 could, in certain scenarios, render the SSF inoperable. The safety significance of this finding is unresolved pending further NRC evaluation using the SDP. (Section 1R05.05)

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems

1R05 FIRE PROTECTION

.01 Systems Required To Achieve and Maintain Post-Fire SSD

a. Inspection Scope

The team evaluated the licensee's fire protection program against applicable requirements, including License Condition D, Fire Protection; Title 10 of the Code of Federal Regulations Part 50 (10 CFR 50), Appendix R; Appendix A of Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1; 10 CFR 50.48; related NRC Safety Evaluation Reports (SERs); and the plant Technical Specifications (TS).

The team used the licensee's Individual Plant Examination for External Events (IPEEE) and in-plant walkdowns to select four risk significant fire areas for inspection. The four fire areas selected were:

- **Unit 1, Fire Area 34, Turbine Building:** The turbine building is common for all three Oconee units. The area of the turbine building that was chosen is part of Fire Area 34 and includes the turbine oil drain piping, hydrogen purifier for the Unit 1 main generator, and the hydrogen lines. A fire in this area could require unit shutdown from the SSF.
- **Unit 1, Fire Area 106, Cable Spreading Room:** The CSR is located below the MCR and a fire in this area could require unit shutdown from the SSF. The unit CSRs and equipment rooms share a ventilation system.
- **Unit 1, Fire Area 108, East Penetration Room:** The east penetration room contains one train of shutdown equipment. A fire in this area could require unit shutdown from the SSF. A fire in this area could also challenge the fire barriers to the west penetration room and potentially the SSF cables and piping that pass through the west penetration room.
- **SSF:** This area contains the credited equipment to shut down the unit caused by a fire in the MCR, CSR, east penetration room or turbine building. A fire in this area is not postulated to affect plant operations.

The team reviewed the IPEEE, SSA, associated procedures, and system drawings to identify those systems credited for safe shutdown (SSD) of the facility in the event of a fire in the selected fire areas. The inspection included review of the post-fire SSD capability and the fire protection features to ensure that at least one post-fire SSD success path was maintained free of fire damage in the event of a fire.

For a selected sample of SSD systems, components, and plant monitoring instruments, the team reviewed the SSA, applicable fire protection related SERs, and system flow diagrams to evaluate the completeness and adequacy of the SSA and the systems relied upon to mitigate fires in the selected fire areas.

b. Findings

No findings of significance were identified.

.02 Fire Protection of SSD Capability

a. Inspection Scope

The team reviewed Section 9.5.1 of the Oconee Nuclear Station Updated Final Safety Analysis Report (UFSAR) and plant fire prevention/combustible hazards administrative control procedures for the fire protection program. This review was to verify that the objectives established by the NRC-approved fire protection program were satisfied. The team also toured the selected plant fire areas observing the licensee's implementation of these procedures. The team also reviewed the June 2000 through June 2001 fire protection program summary report as well as the plant fire emergency/incident reports resulting from fire, smoke, sparks, arcing, and equipment overheating incidents for the years 1999-2001. This review was conducted to assess the effectiveness of the fire prevention program and to identify any maintenance or material condition problems related to fire incidents. Additionally, the team reviewed design control procedures to verify that plant changes were adequately reviewed for the potential impact on the fire protection program, SSD equipment, and procedures.

The team performed a walkdown of the primary fire brigade staging and dress-out areas to assess the condition of fire fighting and smoke control equipment. Fire brigade personal protective equipment located in brigade staging area lockers in the turbine building was reviewed to evaluate equipment accessibility and functionality. The team also examined whether backup emergency lighting was provided for access pathways to and within the fire brigade staging and dress-out areas in support of fire brigade operations should a power failure during a fire emergency. The team also observed whether emergency exit lighting was provided for personnel evacuation pathways to the outside exits as identified in the National Fire Protection Association (NFPA) 101, Life Safety Code. The adequacy of the fire brigade self-contained breathing apparatus (SCBAs) was reviewed as well as the availability of supplemental breathing air tanks. Team members also performed walkdowns of the selected fire areas and compared the associated fire fighting pre-plan procedures and drawings with as-built plant conditions. This was done to verify that they were consistent with the fire protection features and potential fire conditions described in the UFSAR.

The team reviewed the fire brigade response procedure and fire brigade training and drill program procedures. Fire drill critiques for operating shifts from 1999 until 2001 as well as fire brigade training/drill records for the same period were reviewed to verify that fire brigade drills had been conducted in high fire risk plant areas and that the fire brigade personnel qualifications, brigade drill response, and brigade performance met the requirements of the licensee's approved fire protection program.

Additionally, the team reviewed flood procedures associated with the turbine building to verify that the fire brigade and operator actions required for post-fire SSD would not be inhibited by fire suppression activities or leakage from fire suppression systems.

b. Findings

No findings of significance were identified.

.03 Post-Fire SSD Circuit Analysis

a. Inspection Scope

On a sample basis, the inspectors verified that cables of equipment required to achieve and maintain SSD conditions in the event of fire in the selected fire zones had been adequately protected. Specifically, the inspectors ensured that fire-induced faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent SSD. During the inspection, a sample of components associated with the EFW, reactor coolant system (RCS) makeup, and RCS isolation and letdown systems were selected for detailed review. Specific components selected included: valves CCW-269, FDW347, HP-398, HP-417, HP-426, LP-1, LP-2, HP-3, HP-4, EFW-315, EFW-316, RC-4, and RC-66; pressurizer heaters; SSF RC makeup pump; and the SSF auxiliary service water pump. From this list of components, cable routing data, including drawings depicting the routing of power and control cables associated with each of the selected components, were reviewed.

On a sample basis, the team also reviewed the licensee's analysis of electrical protective device (e.g., circuit breaker, fuse, relay) coordination and the adequacy of electrical protection provided for non-essential cables which share a common enclosure (e.g., cable tray) with cables of equipment required to achieve and maintain SSD conditions. Additionally, the team examined the licensee's control program for fuse replacement to ensure proper controls were developed and implemented to maintain plant fuse configuration in accordance with design documents.

b. Findings

An apparent violation was identified, in that, an operator action that was described in the licensee's fire protection licensing basis was not appropriately implemented in procedures. This finding had a credible impact on safety and was characterized as an Unresolved Item (URI) pending SDP review.

10 CFR 50.48, "Fire Protection," and Appendix R to 10 CFR 50, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," establish specific fire protection features required to satisfy General Design Criterion 3, "Fire Protection" (GDC 3, Appendix A to 10 CFR 50). Section III.G of Appendix R requires fire protection features be provided for equipment important to SSD. An acceptable level of fire protection may be achieved by various combinations of fire protection features (barriers, fire suppression systems, fire detectors, and spatial separation of safety trains) delineated in Section III.G.2. For areas of the plant where compliance with the technical requirements of Section III.G.2 can not be achieved, licensee's must either seek an

exemption from the specific requirement(s) or provide an alternative shutdown (ASD) capability in accordance with Sections III.G.3 and III.L of the regulation.

Requirements governing the design and operational performance of ASD capabilities are delineated in Section III.L of Appendix R. With regard to the reactor coolant makeup function, Sections III.L.1 and III.L.2 require the ASD capability be able to maintain reactor coolant inventory within the level indication of the pressurizer. Section III.L.3 further requires the ASD capability to be independent (physically and electrically) of the specific fire area under consideration (i.e. the CSR).

The CSR (Fire Area 106) of Oconee Unit 1 contains cables of redundant trains of shutdown equipment. Since redundant cables are located in close proximity, compliance with the fire protection requirements of Section III.G.2 is not readily achievable. Therefore, in accordance with Section III.G.3, the licensee has developed an ASD methodology for this area. This approach relies on the use of dedicated equipment that is principally located within and controlled from the SSF.

Abnormal Procedure, AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Revision (Rev) 20, implements an ASD capability from the SSF in the event of an unmitigated fire in the CSR. However, from a review of this procedure the inspection team noted that shutdown from the SSF may not be initiated until the fire causes a prescribed level of damage to normal methods of accomplishing required shutdown functions from within the MCR. Specifically, shutdown from the SSF is not directed to be initiated until the fire damage causes a loss of both the high pressure injection (HPI) and component cooling (CC) systems or a loss of all feedwater (FW). Additionally, the inspection team noted that the licensee assumes that no spurious actuations would occur as a result of fire for a 10-minute period of time following the decision to activate the SSF. Therefore, based on its interpretation of the Oconee fire protection licensing basis, the licensee assumes no spurious actuations will occur for a 10-minute period of time after the fire damage causes the loss of the HPI and CC systems or all FW systems.

By letter dated September 20, 1982, the licensee responded to a staff request for additional information (letter dated July 17, 1982). In response to staff concerns regarding the potential for spurious operation of RCS isolation valves, (Question No. 4) the licensee stated:

“Upon confirmation of a fire in the plant, operating personnel will be dispatched to the SSF where they will establish communication with the control room...If vital control and monitoring functions (e.g., reactor coolant pressure boundary, reactor coolant makeup capability) become unacceptably degraded or unavailable from the control room, a prompt transfer can be made and control established from the SSF...As stated above, spurious operation is extremely unlikely within the first 10 minutes. To preclude unacceptable consequences of spurious operation in the longer term, circuits are designed to either preclude spurious operation or retain operability of the systems necessary to mitigate such operation.”

By letter dated April 28, 1983, the staff issued its SER of the Oconee Nuclear Station SSF. This SER was based, in part, on the above referenced Duke response. From a review of these documents, the inspection team concluded that upon a confirmed fire in the CSR or other areas where shutdown from the SSF may be required, the SSF should be manned immediately and communication established with the MCR. However, as described above, the licensee's current methodology does not require the SSF to be manned or activated until significant fire damage has occurred which causes the loss of both HPI and CC or all FW.

It should also be noted that, with regard to the staff's concern of inadvertent spurious actuation of valves due to fire, Section 4.7.6 of the NRC SER states:

"The devices whose inadvertent operation by spurious signals could adversely affect SSD have been identified...cable routing of each division (including the SSF cabling) is such that degradation of the redundant shutdown division will not occur, nor will spurious valve actuation occur which might cause an inadvertent depressurization of the primary system in the event of associated circuit interactions."

From a review of cable routing information provided by the licensee, the inspection team determined that cables associated with redundant trains of HPI, the pressurizer (PZR) power operated relief valve (PORV), PZR PORV block valve, and letdown isolation valves are all routed within a relatively small (twenty-foot by eight-foot) area located in the southeast corner of the CSR (Fire Area 106). To assess the potential effects of the licensee's stated position (i.e., no spurious actuations are assumed to occur for 10 minutes following the loss of either HPI and CC or all FW systems) with respect to accomplishing post-fire SSD conditions in the event of fire in this location, the inspection team developed the following scenario:

- Fire initiates in the room and develops in the southeast corner of the CSR (Fire Area 106)
- Fire damage to control cables associated with the PZR PORV block valve causes loss of ability to close this valve from the MCR.
- Fire damage to control cables associated with redundant letdown isolation valves results in the inability to isolate letdown from the MCR.
- Fire damage to control cables associated with the PZR PORV causes the PZR PORV to spuriously open. Although RCS inventory is being depleted through the PZR PORV and/or letdown flowpaths, the loss of inventory may be partially masked by the makeup capability of the HPI system.
- Subsequent to the spurious actuation of the PZR PORV, fire damage to control cables associated with redundant trains of HPI results in a loss of RCS makeup capability at a time when RCS inventory is being depleted through the open PORV and/or letdown flowpaths.

- CC becomes inoperable due to fire damage to control cabling in the CSR.
- Upon loss of both HPI and CC operators are procedurally directed to activate the SSF.

A fire damage scenario such as the one above could impact the ability of the unit to achieve and maintain SSD conditions. This is because the limited capacity of the SSF makeup pump (~30 gallons per minute) could be overwhelmed by a PZR PORV valve opened as a result of a fire-induced spurious actuation. (The PZR PORV can be isolated from the SSF by the block valve.) Ultimately, this mismatch between SSF makeup pump capacity and PZR PORV relief capacity could impede natural circulation. This in turn could lead to a loss of function.

Given this, the inspectors were concerned that if the licensee does not send an operator to the SSF at the confirmation of a fire as described in their licensing basis, then this increases the amount of time during which the unit is vulnerable to the effects of spurious actuation.

Pending additional review of this item by the NRC to determine if a loss of function occurs, and the evaluation of risk using the SDP, this failure to meet the fire protection licensing basis as documented in the staff's Safety Evaluation dated April 28, 1983, is identified as URI 50-269,270,287/02-03-01, Failure to Meet License Basis Commitment for Staffing the SSF in the Event of a Confirmed Plant Fire. This issue was entered into the licensee's corrective action program in Problem Investigation Process (PIP) O-02-00609.

.04 ASD Capability

a. Inspection Scope

The team reviewed the licensee's ASD methodology to determine the adequacy of the identified components and systems to achieve and maintain SSD conditions for each fire area selected for review and to verify conformance with applicable requirements as listed in Section .01 above. The team specifically reviewed the adequacy of the systems and components selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions. The team verified that SSD equipment required to mitigate a fire in Fire Areas 34, 106, and 108 were powered from the SSF electrical distribution system. Power, control, and instrumentation cables required to support operation from the SSF were also verified to be free from fire induced faults that could defeat operation from the SSF control panel. Control circuits of SSD equipment transferred from the MCR control panel to the SSF control panel were reviewed and verified to have redundant fusing installed to protect against the occurrence of hot shorts in the fire areas that could affect the transfer to the SSF control panel.

b. Findings

No findings of significance were identified.

.05 Operational Implementation of ASD Capability

a. Inspection Scope

The team reviewed the operational implementation of the ASD capability for a fire in the selected fire areas to verify that: (1) the procedures for use of the ASD capability were consistent with the SSA methodology and assumptions; (2) the procedures were written so that the operator actions could be correctly performed within the times assumed in the SSA; (3) the training program for operators included alternative or dedicated SSD capability; (4) personnel required to achieve and maintain the plant in hot standby from outside the control room could be provided from normal onsite staff, exclusive of the fire brigade; and (5) the licensee periodically performed operability testing of the SSD instrumentation and transfer and control functions. The team walked down selected portions of AP/1/A/1700/008, "Loss of Control Room," Rev 05, and AP/0/A/1700/025, "Standby Shutdown Facility Emergency Operating Procedure," Rev 20, to verify that the procedures could be performed within the required times, given the minimum required staffing level of operators, with or without offsite power. Operator and fire brigade staffing was reviewed to verify compliance with the TS and conformance with the fire protection program. The team reviewed operator training lesson plans and job performance measures (JPMs), and discussed the training with operators, to verify that ASD activities were appropriately included in the training program.

b. Findings

The team identified one finding in this area: an operator action that was required by the licensee's SSA was not included in the operating procedures. This finding had a credible impact on safety and was characterized as a URI pending SDP review.

The SSA stated that, when activating the SSF to mitigate a fire, operators must manually close valve FDW-315 in the east penetration room. This action was needed to prevent the spurious actuation of an EFW pump from disabling the SSF by causing an overcooling event which would be beyond the capability of the SSF RC makeup pump. However, this operator action was not included in SSF operating procedures.

Licensee operators showed the team that some related operator actions were included in emergency operating procedures (EOPs), which would be performed by an operator who would stay in the control room after the SSF was activated (for a fire in all areas except the control room). The EOPs directed operators to recognize an overcooling event and then take various actions to stop it (e.g., by locally stopping a pump). For scenarios involving a fire outside the control room such actions could prevent the SSF from being disabled by a spurious actuation of an EFW pump. However, in the case of a control room fire that required evacuation of the control room and activation of the SSF, no one would perform the EOPs.

TS 5.4.1 requires that written procedures be established, implemented, and maintained covering activities recommended in Regulatory Guide 1.33, Rev 2, Appendix A, of February 1978. This regulatory guide requires that the events of a fire in the control room or a forced evacuation of the control room be covered by written procedures.

Additionally, Oconee License Condition D, Fire Protection, requires a fire protection program in accordance with listed NRC SERs, which in turn require compliance with 10 CFR 50, Appendix R, Paragraph III. L, Alternative and Dedicated Shutdown Capability. Paragraph III.L requires that procedures be in effect to implement the alternative and dedicated SSD capability (the SSF at Oconee). The team concluded that, contrary to these requirements, the licensee's procedures were inadequate to mitigate a control room fire that required evacuation of the control room and activation of the SSF.

This finding had a credible impact on safety, in that, during a control room fire that required evacuation of the control room and activation of the SSF, if a spurious actuation of an EFW pump occurred, it could cause an overcooling of the RCS which would be beyond the capability of the SSF reactor coolant makeup pump. This finding affected the mitigating system cornerstone. The safety characterization of this finding has not yet been finalized. Therefore, this finding is unresolved pending further NRC evaluation to determine its safety significance using the Significance Determination Process. This finding is identified as URI 50-269,270,287/02-03-02, An Operator Action that was Required by the Fire Safe Shutdown Analysis was not Included in the Operating Procedures. This issue was entered into the licensee's corrective action program in Problem Investigation Process Report (PIP) O-02-00609.

.06 Communications for Performance of ASD Capability

a. Inspection Scope

The team reviewed the adequacy of the communication system to support plant personnel in the performance of alternative SSD functions and fire brigade duties. The licensee credited the radio repeater systems for prompt fire brigade personnel response and post-fire SSD control room operator response. The inspectors reviewed the adequacy of the radio communication system utilized by the fire brigade and verified the licensee's portable radio channel features would operate should the radio repeaters be unavailable. The team performed walkdowns of sections of the ASD procedures and inspected selected shutdown equipment required for remote manual operator actions to verify that adequate communications equipment would be available for the personnel performing the procedures. The team also reviewed the periodic testing of the SSD radio repeater systems and inventory surveillance of post-fire SSD operator equipment to assess whether the surveillance test program for the radios was sufficient to verify proper operation of the system.

b. Findings

No findings of significance were identified.

.07 Emergency Lighting for Performance of ASD Capability

a. Inspection Scope

The team reviewed the design, operation, and manufacturer's data sheets on the installed individual direct current (DC) emergency lighting system self-contained, battery powered units to verify that battery power supplies were rated with at least an 8-hour

capacity as required by III.J of Appendix R. The team performed a walkdown of the remote shutdown equipment to verify that emergency lighting units (ELUs) were operational and the lamp heads were aimed to provide adequate illumination to perform the shutdown actions required by the procedures. The team reviewed the adequacy of emergency lighting for safe-shutdown activities to verify that it was adequate for the access and egress pathways to the SSF. The team also reviewed periodic test and maintenance procedures and documents to determine if adequate surveillance testing was in place to ensure operation of the ELUs in the event of a fire at the site. The team also verified that dedicated and operable flashlights were provided in emergency lockers for the operators.

b. Findings

No findings of significance were identified.

.08 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed existing procedures and equipment to verify that the licensee had dedicated repair procedures, equipment, and materials to accomplish repairs of damaged components required for cold shutdown, that these components could be made operable, and that cold shutdown could be achieved within 72 hours. The team observed cold shutdown repair equipment and cables stored in nearby warehouses for providing electrical power to pumps and valves as potentially needed after a large fire. The team verified that the equipment was appropriately labeled and was maintained in good condition. Also, the team walked down the procedure and routing for providing temporary switchgear and cabling to power an HPI pump after a large fire in the turbine building. The team verified that the procedure was sufficiently detailed and accurate and that the estimated manpower and time to perform it was reasonable.

b. Findings

No findings of significance were identified.

.09 Fire Barriers and Fire Area/Zone/Room Penetration Seals

a. Inspection Scope

The team reviewed the selected fire areas to evaluate the adequacy of the fire resistance of fire area barrier enclosure walls, ceilings, floors, structural steel support protection, fire barrier penetration seals, fire doors, and fire dampers to ensure that at least one train of SSD equipment was free of fire damage. The team observed the material condition and configuration of the installed fire barrier features, as well as, reviewed construction details and supporting fire endurance tests for the installed fire barrier features. The team compared the observed in-situ seal configurations to the design drawings and tested configurations. The team also compared the penetration seal ratings with the ratings of the barriers in which they were installed.

The team reviewed remote shutdown procedures, selected pre-fire strategy plans, and heating ventilation and air conditioning (HVAC) systems to verify that access to remote shutdown equipment and operator manual actions would not be inhibited by smoke migration from one area to adjacent plant areas used to accomplish SSD.

In addition, the team reviewed the licensing documentation, engineering evaluations of fire barrier features, and engineering evaluations for NFPA code deviations to verify that the fire barrier installations met design requirements and license commitments.

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features, and Equipment

a. Inspection Scope

The team reviewed flow diagrams, cable routing information, periodic test procedures, engineering evaluations for NFPA code deviations, and operational valve lineup procedures associated with the electric driven high pressure service water (fire) pumps and fire protection water supply system. The review was to determine whether the common fire protection water delivery and supply components could be damaged or inhibited by fire-induced failures of electrical power supplies or control circuits. Additionally, team members performed a walkdown of portions of fire protection water supply system in the selected areas to assess the material condition, operational effectiveness, and whether the installed configurations were within the parameters of the engineering evaluations.

The team verified that adequate fire protection features were installed in accordance with the separation and design requirements of Appendix A of BTP APCSB 9.5-1. The team walked down accessible portions of the fire detection and alarm systems in the selected plant areas to evaluate the engineering design and operation of the installed configurations. The team also reviewed engineering drawings for fire detector, spacing and locations in the selected plant areas to verify effectiveness of the systems and compliance with the licensee's UFSAR and associated NFPA Code of Record.

The team reviewed the adequacy of the design and installation of the carbon dioxide (CO₂) fire suppression system for the SSF emergency diesel generator room and the manually actuated sprinkler system located in the CSR (Fire Area 106). Team members performed a walkdown of the selected areas to assure proper placement and spacing of CO₂ nozzles and sprinkler heads and the lack of sprinkler head obstructions. Design calculations were verified to ensure that the required fire hose water flow and sprinkler system density for each protected area were available. The team reviewed a sample of manual fire hose lengths to verify that they could reach the SSD equipment. The team also verified whether the design and placement of the manual fire fighting fire hose equipment and fire extinguishers were properly reflected in the fire brigade pre-fire plans. The team reviewed CO₂ fire suppression system controls to assure accessibility and functionality of the system and associated ventilation system fire dampers. Licensee

design calculations, vendor certifications, and pre-operational test data were verified to ensure that the required quantity of CO₂ for the areas was available.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team reviewed the licensee's Nuclear Station Directive (NSD) 316, "Fire Protection Impairment and Surveillance," Rev. 8, which controls the unavailability and compensatory measures for fire protection and SSD equipment. The review was performed to verify that the risk associated with removing fire protection and/or post-fire systems or components was properly assessed and adequate compensatory measures were implemented in accordance with the approved fire protection program. The team also reviewed PIPs generated over the last 18 months as a result of any fire protection features that were not returned to service within the time frames specified by NSD-316.

b. Findings

No findings of significance were identified.

.12 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed the licensee's administrative fire protection impairment and surveillance procedures; selected licensee commitments (SLCs); corrective maintenance work orders for fire protection equipment; and selected action requests for fire protection and SSD issues to evaluate the prioritization for resolving fire protection related deficiencies and the effectiveness of corrective actions.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Meetings

Exit Meeting Summary

The team presented the inspection results to Mr. Ron Jones, Plant General Manager, and other members of licensee management and staff at the conclusion of the inspection on February 8, 2002. The licensee acknowledged the findings presented. No proprietary information is included in this report.

PARTIAL LIST OF PERSONS CONTACTEDLicensee

D. Brandes, Duke Corporate Engineer - Appendix R and Classical Fire Protection
 G. Chronister, Electrical Engineer
 D. Coyle, Operations Procedures Supervisor
 W. Foster, Safety Assurance Manager
 K. Grayson, Systems Engineer for SSF
 T. Harbinson, Electrical Engineer
 B. Heineck, Supervisor Fire Protection Program
 R. Jones, Plant General Manager
 H. Lefkowitz, Engineer - Appendix R /Fire Protection
 W. McCollum, Site Vice President, Oconee Nuclear Station
 L. Nicholson, Regulatory Compliance Manager

NRC

C. Ogle, Branch Chief DRS, RII
 C. Payne, Senior Reactor Inspector, RII
 W. Rogers, Senior Reactor Analyst, RII

ITEMS OPENED, CLOSED, and DISCUSSEDOpened

50-269,270,287/02-03-01	URI	Failure to Meet License Basis Commitment For Staffing the SSF for a Confirmed Fire (Section 1R05.03)
50-269,270,287/02-03-02	URI	An Operator Action that was Required by the Fire Safe Shutdown Analysis was Not Included in the Operating Procedures (Section 1R05.05)

Closed

None

Discussed

None

LIST OF ACRONYMS

AP	-	Abnormal Procedure
APCSB	-	Auxiliary and Power Conversion Systems Branch
ASD	-	Alternative Shutdown
BTP	-	Branch Technical Position
CC	-	Component Cooling
CFR	-	Code of Federal Regulations
CSR	-	Cable Spreading Room
DC	-	Direct Current
EFW	-	Emergency Feedwater
EOP	-	Emergency Operating Procedure
FDW/FW	-	Feedwater
FSAR	-	Final Safety Analysis Report
GDC	-	General Design Criteria
HPI/HP	-	High Pressure Injection
HVAC	-	Heating, Ventilation, and Air Conditioning
IPEEE	-	Individual Plant Examination for External Events
JPM	-	Job Performance Measure
LP/LPI	-	Low Pressure Injection
MCR	-	Main Control Room
NCV	-	Non-Cited Violation
NRC	-	Nuclear Regulatory Commission
NSD	-	Nuclear Site Directive
OMP	-	Operations Management Procedure
PIP	-	Problem Investigation Report
PORV	-	Power Operated Relief Valve
PRA	-	Probabilistic Risk Assessment
RCP	-	Reactor Coolant Pump
RCS/RC	-	Reactor Coolant System
SCBA	-	Self-Contained Breathing Apparatus
SDP	-	Significance Determination Process
SER	-	Safety Evaluation Report
SLC	-	Selected Licensee Commitment
SSA	-	Safe Shutdown Analysis
SSD	-	Safe Shutdown
SSF	-	Standby Shutdown Facility
SOG	-	Standard Operating Guide
SW	-	Service Water
TS	-	Technical Specifications
UFSAR	-	Updated Final Safety Analysis Report
URI	-	Unresolved Item

LIST OF DOCUMENTS REVIEWED

Procedures

AP/1/A/1700/008, Loss of Control Room, Rev 005

AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Rev 20

AP/1/A/1700/010, Turbine Building Flood, Rev 5

Fire Brigade SOG #1, General Response Procedure, dated June 1, 1984

Fire Brigade SOG #2, Staffing Guidelines, dated December 5, 1989

Fire Brigade SOG #3, Electrical Fires, dated January 11, 1989

Fire Brigade SOG #4, Brigade Leadership Procedure, dated January 23, 1986

Fire Brigade SOG #7, Wheeled Extinguisher Locations, dated December 6, 1989

Fire Brigade SOG #9, Hose Selection and Use, dated November 16, 1998

Fire Brigade SOG #10, Fire Brigade Equipment Locations, dated November 16, 1998

NSD 112, Fire Brigade Organization, Training, and Responsibilities, Rev 5

NSD 112, Modification Engineering Quality Standards Manual, Rev 21

NSD 313, Control of Combustible and Flammable Material, Rev 3

NSD 314, Hot Work Authorization, Rev 2

NSD 315, Temporary Structures, Rev 1

NSD 316, Fire Protection Impairment and Surveillance, Rev 3

OP/0/A/1104/011, High Pressure Service Water, Rev 54

RP/0/B/1000/029, Fire Brigade Response, Rev 2

EP/1/A/1800/001, Emergency Operating Procedure, Rev 30

IP/0/A/0050/002, Fire Damage Control Procedure, Rev 18

OMP 2-01, Duties and Responsibilities of On-shift Operations Personnel, dated October 2, 2001

OP/0/A/1102/024, Operational Guidelines Following Fire in Auxiliary Building, Turbine Building, or Vital Area, Rev 023

RP/0/B/1000/022, Procedure for Site Fire Damage Assessment and Repair, Rev 007

Job Performance Measures (JPMs) and Lesson Plans

JPM CRO-005, Evacuate the Control Room, Rev 13

JPM CRO-052, Perform Required Actions in Preparation for Manning the SSF, Rev 4

Lesson Plan - Standby Shutdown Facility (EAP-SSF), Rev 14

Calculations and Design Specifications

Calculation C-OSA-SA-85-006-0, Evaluation of Spurious Pump Actuation During an Appendix R Fire, dated October 15, 1985

Calculation OSC-3770, EFW Isolation During 10 CFR 50 Appendix R Event, dated October 20, 1989

ONDS-0340, Auxiliary Building Internal Flood Design Study, Summary of Critical Volumes

OSC-7185, Fire Evaluation of the East West Penetration Room Wall, dated September 6, 1998

Calculation OSC-7350, Attachment 1, Penetration Seals, Rev 1

OSS-0072.00-00-1006, Design Basis Specification for 10 CFR 50 Appendix R Applicability to Oconee Nuclear Station, Rev 1

OSS-0254.00-00-1002, Design Basis Specification for the High Pressure Service Water System, Rev 15

OSS-0254.00-00-2017, Design Basis Specification for the Fire Detection System, Rev 5

OSS-0254.00-00-4008, Design Basis Specification for Fire Protection, Rev 8

Fire Hose Nozzle Evaluation, dated September 16, 1998

Calculation DPC 1435.00-00-0006, Fire Protection Penetration Seals, Rev 2

Design Basis Specification OSS-0245.00-00-4008, ONS Fire Protection Program, Rev 8

Design Basis Specification for the Standby Shutdown Facility 125 VDC Essential Power System, Specification No. OSS-0254.00-00-2020, Rev 4.

Design Basis Specification for the 4160/600/120 V SSF Essential AC Power System, Specification No. OSS-0254.00-00-2014, Rev 4.

Design Basis Specification for the SSF Diesel Support System, Spec. OSS-0254.00-00-1008, Rev 9.

Design Basis Specification for the Standby Shutdown Facility Auxiliary Service Water System, Spec. OSS-0254.00-001005, Rev 11.

Specification for the Maintenance of the 10CFR50 Appendix "R" Program, Specification No. OSS-0072.00-00-0006, Rev 1.

Completed Surveillance Test Records

PT/1/A/0600/001, Periodic Instrument Surveillance, completed on February 1, 2002

PT/1/A/0600/001, Periodic Instrument Surveillance, completed on February 2, 2002

PT/1/A/0600/001, Periodic Instrument Surveillance, completed on February 3, 2002

IP/O/B/3000/020, PM of Self-Contained Battery Packs on Emergency Lights, Rev 27

PT/O/A/0400/002, SSF CO₂ Fire Protection System Test, Rev 22

PIP REPORTS, AUDITS, AND SELF ASSESSMENTS

PIP O-01-01325, SSF Cables Do Not Meet 10 CFR 50, Appendix R, Section III.G Separation Requirements

PIP O-99-03061, Fire Detector System Detector Placement

PIP O-98-00609, Safety Group Assessment SA-98-19, Egress/Life Safety

SA-01-17 (ALL) (NPAS), 2001 Triennial Fire Protection Assessment, PIP O-01-02272; Areas of improvement identified by Duke Triennial Fire Protection Team dated June 14, 2001

PIP O-01-00148; Safety Assessment of Fire Protection/Prevention Category of the Duke Power Safe Work Practice Manual on Fire Reporting and Emergency Evacuation

PIP O-99-03380; C&S assessment of Observation of Fire Protection Equipment Inspection

PIP 3-089-00198; Analysis of fire-induced Spurious Actuation of LP-1 and LP-2

PIP O-99-02753; Ability of control room to communicate with NLOs via radio for all events is questionable

PIP O-00-04076; Valve FDW-315 had been removed from the Safe Shutdown analysis procedure but reference still remained in the Appendix R Specification, committed battery light test procedure, and UFSAR

PIP O-01-04140; There are no specific 10 CFR 50 Appendix R mitigation procedures providing shutdown guidance for a fire in the west penetration room

Drawing Numbers

0-702, One Line diagram, 6900V & 4160V Station Auxiliary System Rev 25

0-702-B, One Line Diagram, 4160 and 600V Essential load Centers Auxiliary Power Systems, Standby Shutdown Facility, Rev 12.

0-703-D, One Line Diagram, Station Auxiliary Circuits 600V, Rev 49.

0-703-G, One Line Diagram, Station Auxiliary Circuits 600/208/480, Rev 72.

0-704, One Line Diagram 208/120 VAC, Rev 91.

0-705, One Line Diagram, 120 VAC & 125 VDC Station Auxiliary Circuits Instrumentation Vital Buses, Rev 74.

0-0706, One Line Diagram Essential SSF 125 VDC Auxiliary Power Systems, Rev 11.

OEE-149-8, Elementary diagram, SSF Pressurizer Heater Group "B", Bank 2, Rev 19.

OEE-149-8A, Elementary Diagram SSF Pressurizer Heater Group "B", Bank 2, Rev 3.

OEE-150, Elementary Diagram Press. Relief Block Valve SSF-1RC4 (1/50/1), Rev 10

OEE-150-A, Elementary Diagram Press. Relief Block Valve SSF-1RC4 (1/50/1), Rev 2.

OEE-150-7, Elementary Diagram Pressurizer Relief Valve (1RV-67) 1RC66, Rev 11.

OEE-150-7A, Elementary Diagram Pressurizer Relief Valve (1RV-67) 1RC66, Rev 4.

OEE-150-15, Elementary Diagram Reactor Coolant System Steam Generator "1B" Vent Valves. 1RC157 & 1RC158, Rev 3.

OEE-150-16, Elementary Diagram Reactor Coolant System Reactor Vessel Head Vent Valves 1RC159 & 1RC160, Rev 3.

OEE-150-19, Elementary Diagram Reactor Coolant System Steam Generator "1A" Vent Valves 1RC155 & 1RC156, Rev 3.

OEE-151-A, Elementary Diagram Letdown Cooler "A" Outlet Valve 1HP-3 (FS-1/51/3), Rev 0

OEE-151, Elementary Diagram Letdown Cooler "A" Outlet Valve FS/1/51/3 1HP-3, Rev 7.

OEE-151-1, Elementary Diagram Letdown Cooler "1B" Outlet Valve FS/1/51/4 1HP-4, Rev 9.

OEE-151-1A, Elementary Diagram Letdown Cooler "B" Outlet valve 1HP-4 (FS/1/51/4), Rev 1.

OEE-151-16, Elementary Diagram Reactor Coolant Pump "1A2" Seal Return Valve FS/1/51/271, Rev 9.

OEE-151-15, Elementary Diagram Reactor Coolant Pump "1A1" Seal Return Valve FS/1/51/273, Rev 8.

OEE-151-25, Elementary Diagram Letdown Storage Tank Vent Valve 1/51/22, Rev 1.

OEE-151-35, Elementary Diagram Steam Generator "A" Feed Water Control Valve SSF-1CCW-269, Rev 4.

OEE-151-36, Elementary Diagram SSF Steam Generator "B" Feed Water Control Valve SSF-1FDW-347, Rev 4.

OEE-151-38, Elementary Diagram Reactor Coolant Makeup Return Valve 1HP-417, Rev 2.

OEE-151-44, Elementary Diagram Reactor Coolant Makeup Pump Discharge Valve 1HP-398, Rev 2.

OEE-151-45, Elementary Diagram Reactor Coolant Makeup Letdown Valve 1HP-426, Rev 2.

OEE-152-14, Elementary Diagram Return Block Valve 1LP-2 (1/53/40), Rev 11.

OEE-152-25, Elementary Diagram L P LOCA Boron Dilution System Motor Operated Valve 1LP-105, Rev 5.

OEE-163-16, Elementary Diagram Standby Shutdown Facility SSF Control Transfer, Rev 2.

0-752-A16, Interconnection Diagram Motor Control Center #1XS1 Unit #5, Rev 12.

0-714-I, Connection Diagram Vertical Board No. 1VB2 Inside Rear View, Rev 57.

0-721-A, Connection Diagram Valves High Pressure Injection & Purification System, Rev 48.

0-757-G, Connection Diagram Engineered Safeguards Normal Control Cabinet 8, Rev 15.

0-752-A-74, Connection Diagram 600 V Remote Starter Vertical Compt. F1A thru F1C & Compt. F2A, Rev 9.

- 0-714-H, Connection Diagram Vertical Board No. 1VB2 Inside Front view, Rev 49.
- 0-714-I, Connection Diagram Vertical Board No. 1VB2 Inside Rear View, Rev 57.
- 0-711-C, Connection Diagram Unit Control board # 1UB1, Rev 54.
- 0-721, Connection Diagram Miscellaneous Equipment High Pressure Injection & Purification System, Rev 13.
- 0-752-A61, Interconnection Diagram Motor Control Center No. 1XT Unit No. 6, Rev 6.
- 0-752-A17, Interconnection Diagram Motor Control Center No. 1XS1 Unit No. R1, R2, R3, & R4, Rev 24.
- 0-767-A10, Connection Diagram reactor Building Penetrations Type "D" Penetration , Penetration No. ED10, Rev 16.
- 0-5, General Arrangement Turbine Building, Auxiliary Building, Reactor Building Plan, Elevation 758+0, Rev 13
- 0-6, General Arrangement Turbine Building, Auxiliary Building, Reactor Building Plan, Elevation 771+0, Rev 14
- 0-7, General Arrangement Turbine Building, Auxiliary Building, Reactor Building Plan, Elevation 783+9, Rev 15
- 0-8, General Arrangement Turbine Building, Auxiliary Building, Reactor Building Plan, Elevation 796+6, Rev 19
- 0-10, General Arrangement Turbine Building, Auxiliary Building, Reactor Building Plan, Elevation 822+0, Rev 14
- 0-710, Plan, Control Room Elevation 822+0, Rev 30.
- 0-710-A, Plan, Cable Room Cable Tray Layout Elevation 809+3, Rev 51.
- 0-710-B, Plan, Cable Room Cable Tray Layout Elevation 809+3, Rev 25.
- 0-916, Auxiliary Building Electrical Equipment Layout Cable Shaft, Rev 19.
- 0-913, Auxiliary Building Electrical Equipment Layout Penetration Room Plan Below Elevation 838+0, Rev 35.
- O-115L-1, Auxiliary Building, Unit 1, Firewall in West Penetration Rooms, Rev 6
- O-157-A, -B, Auxiliary Building, Units 1 and 2, Concrete Plans, Rev 25

O-310-K-10, Auxiliary Building, Unit 1, Fire Protection Plan & Fire, Flood, & Pressure Boundaries, Rev 5

O-310-K-13, Auxiliary & Reactor Building, Unit 1, Fire Protection Plan & Fire, Flood, & Pressure Boundaries, Rev 5

O-310-L-04, Turbine Building, Unit 1, Fire Protection Plan & Fire, Flood, & Pressure Boundaries, Rev 5

O-1029-04, Auxiliary Building Architectural Door Schedule, Rev 15

OFD-124C-1, Flow Diagram of High Pressure Service Water System, Rev 18

OFD-138B-1, Flow Diagram of Carbon Dioxide Fire Protection System, Rev 3

OM-242-0014-001, Cable Spread and Cable Shaft Sprinkler System, Rev D3

B/M O-846, Emergency Lighting, Rev 4

B/M O-2842, Emergency Lighting, Rev 0

B/M O-2846, Emergency Lighting, Rev 2

Other Documents Reviewed

Oconee UFSAR Chapter 9.5.1 Fire Protection System, 12/31/00

Oconee Modification Manual Chapter 7.1 "Fire Protection 10CFR50 Appendix R Electrical Reviews," 12/9/01

Letter dated September 20, 1982 from H. Tucker (Duke) to H. Denton (NRC); Subject: Response to July 17, 1982 staff request for additional information regarding Oconee Standby Shutdown Facility.

Letter dated April 28, 1983, from J. Stolz (NRC) to H. Tucker (Duke) Subject: Safety Evaluation of SSF

Letter from S.D. Ebnetter (NRC) to H.B. Tucker (NRC) dated July 17, 1989
Engineering Calculation: Oconee Relay Settings and Breaker Coordination, OSC-3120, Rev. 4, 10/28/97

Letter, H. Denton, NRC, to W. Parker Jr., Duke Power Company, Request for Exemption from 10 CFR 50, Appendix R, Item III.G.3, dated February 2, 1982

Letter, R. Reid, NRC, to W. Parker Jr., Duke Power Company, Amendments 64 and 61 to Operating License, dated August 11, 1978

Letter, D. Matthews, NRC, to H. Tucker, Duke Power Company, Exemption from Section III.G. of Appendix R, dated August 21, 1989

Letter, H. Nicolaras, NRC, to H. Tucker, Duke Power Company, Exemption from Section III.J., Emergency Lighting, of Appendix R, dated December 27, 1984

Memorandum For File, Safe Shutdown Following an Appendix R Fire, dated November 20, 1985

Memo to File, Appendix R Shutdown Scenario, dated March 3, 1986

Memorandum to File, Appendix R Fire Protection, dated June 23, 1986

Memo To File, Main Steam Line Isolation in the Event of an SSF Activation, dated July 29, 1986

Memorandum For File, Appendix R (Fire Protection) - Secondary Side Isolation During SSF Operation, dated September 23, 1986

Memorandum For File, Appendix R Fire - Reactor Colant Pump Trip, dated October 20, 1986

Memo to file OS-72, LP-1 and LP-2 analysis, dated 2/2/88

Memo to file, (undated/unreviewed); " Hot Shutdown/SSS/Associated Circuits

Duke Power Company Cable Installation Data Sheets

Licensee Event Report 87-002-00, 3/16/87; Appendix R review with respect to valve operability

UFSAR Chapter 9, Section 9.5.1, Fire Protection System

UFSAR Chapter 16, Fire Protection Selected Licensee Commitments

Fire Protection Program Health Report, June 2000 through June 2001

Ohio State University Building Research Laboratory, Report 7618, Standard ASTM Fire Endurance Test on Duplicate Non-load Bearing Unsymmetrical Wall Assemblies with Through-Penetration Fire Stops, dated January 3, 1985

ONS Fire Plan, Pre-fire Plan Fire Zone 106, Unit 1 Cable Room, Rev 1

ONS Fire Plan, Pre-fire Plan Fire Zone 108, Unit 1 East Penetration Room, Rev 0

ONS Fire Plan, Pre-fire Plan Fire Zone 34, Unit 1 6900/4160 V Switchgear, Rev 0

ONS Fire Plan, Pre-fire Plan Standby Shutdown Facility, Rev 1

ONS QA Topical Report, Amendment 6, dated February 6, 1983

Work Order Task 98429067, Emergency Lighting Capacity Test, completed November 25, 2001

Chemetron Fire Systems, Low Pressure CO₂ System Test Report, dated June 12, 1984

Emerg-Lite Products Co., 6 V. Emergency Lighting Unit Rating Chart, dated May, 1995

Honeywell Inc., Specification Manual for TC806A and TC807A Smoke Detectors, dated 1998

Ruskin Fire Damper Manufacturing, Specification Manual for FSD60-3 Fire Smoke Dampers, dated 1997

Tyco Fire Products, Specification for Gem Model F916 Upright Sprinkler, dated August 17, 2001

Minor Modification ONOE-16234, Replacement of "OPEN" sprinkler heads in the Unit 1 Equipment and Cable Rooms, and Cable Shaft systems, dated June 14, 2001

APPLICABLE CODES AND STANDARDS

NFPA 13, Standard for the Installation of Sprinkler Systems, 1978 Edition.

NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 1976 Edition.

NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection, 1969 Edition.

NFPA 20, Standard for the Installation of Centrifugal Fire Pumps, 1982 Edition.

NFPA 72D, Standard for the Installation, Maintenance, and Use of Proprietary Protection Signaling Systems, 1975 Edition.

NFPA 72E, Standard on Automatic Fire Detectors, 1974 Edition.

NFPA 80, Standard on Fire Doors and Windows, 1983 Edition.

NFPA 90A, Standard on Air Conditioning and Ventilating Systems, 1981 Edition.

NFPA 101, Life Safety Code, 1996 Edition

NUREG-1552, Supplement 1, Fire Barrier Penetration Seals in Nuclear Power Plants, dated January 1999

PIPs Written During This Inspection

PIP O-02-00488 Appendix R Audit Preparation Identification of Discrepancies in the Fire DBD and the SSF-ASW DBD

- PIP O-02-00526 Location of Control Switch Discrepancies Between Actual Location and Drawings
- PIP O-02-00529 Calculation OSC-2310 Does Not Determine Bounding Cooldown Rate for SSF Operability
- PIP O-02-00560 Uncontrolled Documents Located in Fire Cabinets
- PIP O-02-00582 Backup Battery-Powered Emergency Lighting Not Provided to Illuminate Exit Paths From Control Room to Fire Brigade Dress-Out Staging Areas
- PIP O-02-00609 Questions of Procedural Guidance for Spurious Actuation of EFW and Acceptability of the Start of the 10 minute Time for Spurious Actuations
- PIP O-02-00621 NFPA 101, Life Safety Code emergency exit lighting not provided for personnel evacuation pathways as required by OSHA