UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

February 28, 2003

R. T. Ridenoure
Division Manager - Nuclear Operations
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
P.O. Box 550
Fort Calhoun, Nebraska 68023-0550

SUBJECT: FORT CALHOUN STATION - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 50-285/03-02

Dear Mr. Ridenoure:

On December 20, 2002, the NRC completed the onsite portion of the subject inspection at your Fort Calhoun Station. Review of additional documentation provided to the NRC subsequent to the onsite inspection was performed from January 13-17, 2003. The enclosed report documents the inspection findings, which were discussed with Messrs. R. Clemens, Division Manager - Nuclear Assessments, R. Phelps, Division Manager - Nuclear Engineering, and other members of your staff on January 17, 2003.

This triennial fire protection 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. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC identified one issue that had very low safety significance (Green). This finding is being treated as a noncited violation, consistent with Section VI.A of the Enforcement Policy. The noncited violation is described in the subject inspection report and was not cited because of very low safety significance and the issue was entered into the corrective action program. If you contest the violation or significance of the noncited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Fort Calhoun Station facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made 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 Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/**RA**/

Charles S. Marschall, Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Docket: 50-285
License: DPR-40

Enclosure:
NRC Inspection Report
50-285/03-02

cc w/enclosure:
John B. Herman, Manager
Nuclear Licensing
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
P.O. Box 550
Fort Calhoun, Nebraska 68023-0550

Richard P. Clemens, Division Manager
Nuclear Assessments
Fort Calhoun Station
P.O. Box 550
Fort Calhoun, Nebraska 68023-0550

David J. Bannister, Manager - Fort Calhoun Station
Omaha Public Power District
Fort Calhoun Station FC-1-1 Plant
P.O. Box 550
Fort Calhoun, Nebraska 68023-0550

James R. Curtiss
Winston & Strawn
1400 L. Street, N.W.
Washington, D.C. 20005-3502

Chairman
Washington County Board of Supervisors
P.O. Box 466
Blair, Nebraska 68008

Sue Semerena, Section Administrator
Nebraska Health and Human Services System
Division of Public Health Assurance
Consumer Services Section
301 Centennial Mall, South
P.O. Box 95007
Lincoln, Nebraska 68509-5007

Daniel K. McGhee
Bureau of Radiological Health
Iowa Department of Public Health
401 SW 7th Street, Suite D
Des Moines, Iowa 50309

Technical Services Branch Chief
FEMA Region VII
2323 Grand Boulevard, Suite 900
Kansas City, Missouri 64108-2670

Electronic distribution by RIV:
Regional Administrator **(EWM)**
DRP Director **(ATH)**
DRS Director **(DDC)**
Senior Resident Inspector **(JGK)**
Branch Chief, DRP/C **(CEJ1)**
Senior Project Engineer, DRP/C **(WCW)**
Staff Chief, DRP/TSS **(PHH)**
RITS Coordinator **(NBH)**
Scott Morris **(SAM1)**
FCS Site Secretary **(NJC)**

R:_fc\2003\fc03-02rp-rpm.wpd

RIV:DRS/EMB	EMB	DRP/RI/C	C:EMB	C:DRP/C	C:EMB
RPMullikin/lmb	RLNease	LMWilloughby	CSMarschall	CEJohnson	CSMarschall
/**RA**/	/**RA**/ E	/**RA**/ E	/**RA**/	/**RA**/	/**RA**/
2/27/03	2/9/03	1/30/03	2/27/03	2/27/03	2/27/03

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-285
License:	DPR-40
Report No.:	50-285/03-02
Licensee:	Omaha Public Power District
Facility:	Fort Calhoun Station
Location:	Fort Calhoun Station FC-2-4 Adm. P.O. Box 399, Hwy. 75 - North of Fort Calhoun Fort Calhoun, Nebraska
Dates:	December 16 - 20, 2002 January 13 - 17, 2003
Team Leader:	R. P. Mullikin, Senior Reactor Inspector Engineering and Maintenance Branch
Inspectors:	R. Nease, Senior Reactor Inspector Engineering and Maintenance Branch
	L. Willoughby, Resident Inspector Project Branch C
Accompanying Personnel:	K. Sullivan, Contractor Brookhaven National Laboratory
Approved By:	Charles S. Marschall, Chief Engineering and Maintenance Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 0500285-03-02; Omaha Public Power District; 12/16-20/2002 and 1/13-17/2003; Fort Calhoun Station, Triennial Fire Protection Inspection

The inspection was conducted by a team of two regional inspectors, one resident inspector, and one contractor from Brookhaven National Laboratory. The inspection identified one green finding, which was a violation of NRC regulatory requirements. The significance of most findings is indicated by their color (green, white, yellow, red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be "green" or be assigned a severity level after 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 3, dated July 2000.

Cornerstone: Mitigating Systems

- Green. The licensee failed to assure that at least one train of charging pumps was free of fire damage. A fire in either of two different fire areas could result in the loss of normal charging, which is credited in the licensee's post-fire safe shutdown analysis for maintaining reactor coolant system inventory.

  The team identified a noncited violation of 10 CFR Part 50, Appendix R, Section III.G.2. This finding was of greater than minor significance because it impacted the mitigating systems cornerstone. This resulted from the finding's potential to affect the licensee's capability to maintain reactor coolant system inventory control in response to a fire in either Fire Areas 6 or 36A. This finding was determined to be of very low safety significance, due to the fact that operators would have sufficient time to perform manual actions to restore at least one train of the charging system prior to reactor coolant makeup being required. Because of the low safety significance and the licensee's actions to initiate compensatory measures and place the issue into their corrective action program, this violation is being treated as a noncited violation in accordance with Section VI.A of the Enforcement Policy (50-285/0302-01) (Section 1R05.2).

Report Details

1. REACTOR SAFETY

1R05 Fire Protection

The purpose of this inspection was to review the Fort Calhoun Station fire protection program for selected risk significant fire areas. Emphasis was placed on verification of the licensee's post-fire safe shutdown capability. The inspection was performed in accordance with the new Nuclear Regulatory Commission (NRC) reactor oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team used the "Fort Calhoun Station Individual Plant Examination of External Events," dated June 30, 1995, to choose several risk-significant areas for detailed inspection and review. The fire areas chosen for review during this inspection were:

- Fire Area 6, basement level general area in the auxiliary building
- Fire Area 36A, east switchgear area
- Fire Area 46, turbine building

For each of the selected fire areas, the team focused the inspection on the fire protection features and on the systems and equipment necessary for the licensee to achieve and maintain safe shutdown conditions in the event of a fire in those fire areas.

Documents reviewed by the team are listed in the attachment.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

The team reviewed piping and instrumentation diagrams and the list of safe shutdown equipment documented in the licensee's post-fire safe shutdown analysis to verify whether their shutdown methodology had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for equipment in the fire areas selected for review. The team focused on the following functions that must be ensured to achieve and maintain post-fire safe shutdown conditions.

- Reactivity control capable of achieving and maintaining cold shutdown reactivity conditions
- Reactor coolant makeup capable of maintaining the reactor coolant inventory
- Reactor heat removal capable of achieving and maintaining decay heat removal
- Supporting systems capable of providing all other services necessary to permit extended operation of equipment necessary to achieve and maintain hot shutdown conditions

A review was also conducted to ensure that all required electrical components in the selected systems were included in the licensee's safe shutdown analysis. The team identified the systems required for each of the primary safety functions necessary to shut down the reactor. These systems were then evaluated to identify the systems that interfaced with the fire areas inspected and were the most risk significant systems required for reaching both hot and cold shutdown conditions. The following systems were selected for review.

- Auxiliary feedwater system
- Chemical and volume control system
- Instrument air system
- Raw water system
- Reactor coolant system
- Safety injection system

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability and Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

The team reviewed licensee documentation to verify that at least one post-fire safe shutdown success path was free of fire damage in the event of a fire in the selected fire areas. Specifically, the team examined the separation of safe shutdown cables, equipment, and components within the same fire areas. Additionally, 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 nonessential cables which share a common enclosure (e.g., cable trays) with cables of equipment required to achieve and maintain safe shutdown conditions. The team reviewed the licensee's methodology for meeting the requirements of 10 CFR 50.48, and the bases for the NRC's acceptance of this methodology as documented in NRC safety evaluation reports. In addition, the team reviewed license documentation, such as the Fort Calhoun Updated Safety Evaluation Report, submittals made to the NRC by the licensee in support of the NRC's review of their fire protection program, and deviations from NRC regulations to verify that the licensee met license commitments.

b. Findings

Introduction: The team identified a noncited violation 10 CFR Part 50, Appendix R, Section III.G.2, as committed to in License Condition D of the Fort Calhoun Station operating license. Specifically, the noncited violation was for the failure to assure that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control stations is free of fire damage, as required

by 10 CFR Part 50, Appendix R, Section III.G.2. There are three methods acceptable for ensuring compliance with Section III.G.2 of Appendix R. These methods are: (a) redundant trains be located in different fire areas separated by 3-hour rated fire barriers; (b) redundant trains in the same fire area be separated by 20 feet of horizontal distance with no intervening combustible or fire hazards, and the area be equipped with area-wide detection and suppression; or (c) one redundant train be separated from the other redundant trains by enclosing it in a 1-hour fire rated barrier, and the fire area be equipped with area-wide detection and suppression. The team found that a fire in either Fire Area 6 or Fire Area 36A could result in the loss of all three trains of charging pumps. The licensee credits these pumps for accomplishing the hot shutdown function of reactor coolant inventory control.

Description:

Fire Area 6: The licensee's safe shutdown analysis states that operation of one of three positive displacement charging pumps (CH-1A, CH-1B or CH-1C) is sufficient to achieve and maintain hot shutdown conditions in the reactor. Since control cables associated with Charging Pumps CH-1A and CH-1B are located in this fire area, the operation of these two pumps may be impacted by the fire. As a result, the safe shutdown analysis credits the use of Charging Pump CH-1C for accomplishing the hot shutdown function of reactor coolant system inventory control.

The team reviewed the licensee's safe shutdown analysis and supporting calculations, including cable routing information contained in Calculation EA-FC-97-044, "10 CFR Part 50 Appendix R Cable Identification," Revision 4, and determined that the credited charging pump (CH-1C) may be vulnerable to loss as a result of a fire in this fire area. Specifically, gas binding of Charging Pump CH-1C could render it inoperable until operator action is taken to restore operation. The three charging pumps share a common suction path from the volume control tank. During normal plant operations, only one of the three pumps will be operating, drawing suction from the volume control tank through a normally open, motor-operated valve (LCV 218-2). Since letdown from the reactor coolant system to the volume control tank is promptly isolated after a reactor trip, there is a potential for the cover gas in the volume control tank to be drawn into the operating charging pump if Valve LCV 218-2 were to remain open. If this were to occur, the operating charging pump could be lost due to gas binding, and result in the loss of the credited method of accomplishing reactor coolant system inventory control. Although the design of the chemical and volume control system includes automatic protection circuitry that would cause Valve LCV-218-2 to close in response to a low volume control tank level, this circuitry is vulnerable to damage as a result of a fire in Fire Area 6. Therefore, operation of this automatic protection feature could not be assured. The licensee determined that operators would have approximately 50 minutes to locally close the volume control tank outlet valve before gas binding would occur. However, the safe shutdown analysis does not credit this manual action due to the lack of emergency lighting in the volume control tank room. In addition, the licensee determined that it would take 82 minutes before charging would have to be reinitiated due to low pressurizer level.

During the inspection, the potential for gas binding to cause pump damage was discussed with the licensee. The licensee stated that the positive displacement charging pumps would not be damaged as a result of gas binding due to the design of the pumps. The team reviewed the operator actions that would be necessary to restore operation of the credited charging pump (CH-1C). The team concluded that operators would need to bleed/purge air locally at the pumps. This would require operators to enter the fire affected area (Fire Area 6). However, the licensee determined that restoration of a least one train of the charging system would not be required for approximately 82 minutes after fire damage occurred. The team agreed with the licensee's determination based on the anticipated reduction in reactor coolant system volume due to a normal cooldown following a reactor trip.

Fire Area 36A: A fire in this area could also lead to a loss of all charging capability in a manner similar to that described above for Fire Area 6. In the event of fire in this area Charging Pump CH-1B is credited for safe shutdown. Charging Pumps CH-1A and CH-1C have control circuits routed through this area and are subject to fire damage. In addition, the automatic closure of the volume control tank outlet valve (LCV-218-2) could be lost due to fire damage. The safe shutdown analysis for this fire area does not credit manual operation of Valve LCV-218-2. Should the volume control tank drain down prior to manual isolation of Valve LCV-218-2, all three charging pumps could be lost due to gas binding. However, an operator would not need to enter this affected fire area to perform actions necessary to restore pump operation by venting the gas from the pump.

.

Risk Analysis: The team determined that the issue was of greater than minor significance because it affects the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of the system that responds to the event to prevent undesirable consequences. The issue had the potential to affect the licensee's ability to maintain the reactor coolant system inventory.

For fire protection findings, the Phase 1 screening worksheet in Manual Chapter 0609, Appendix A, refers fire protection findings to Manual Chapter 0609, Appendix F, for significance evaluation. The team leader and the Region IV senior reactor analyst evaluated the risk using the NRC's Significance Determination Process described in Manual Chapter 0609, Appendix F. A Phase 2 evaluation was performed using the transient (reactor trip) and the anticipated transient without scram (ATWS) significant determination process worksheets. The functions that could be affected by the loss of all three trains of charging pumps were feed and bleed for the reactor trip worksheet, and emergency boration for the ATWS worksheet.

Gas binding of the credited charging pump would not occur for approximately 50 minutes after fire damage occurs. Operators would not have to reinitiate charging, due to low pressurizer level, for approximately 82 minutes after fire damage occurs. If operators can diagnose the potential for gas binding of the charging pumps, then manual actions could be taken to maintain charging. This would require entering the fire affected area (Fire Area 6) prior to 82 minutes after fire damage occurs, and venting the gas-bound pump. Standing Order SO-G-28, Attachment 14, "Restoration of Safe Shutdown Conditions in the Event of a Fire," Revision 53, instructs operators to perform

manual actions in Fire Areas 6 and 36A to maintain adequate reactor coolant system inventory. These actions are to align either the boric acid storage tank or the safety injection refueling water storage tank to the charging pumps. Although not in the procedure, an operator would also have to vent the gas-bound charging pump and close the volume control tank outlet valve in order to restore operation. However, even if a charging pump is not available, Emergency Operating Procedure-20, "Functional Recovery Procedure," Revision 8, would provide operators with instructions to maintain reactor coolant system inventory via the safety injection system. The licensee's fire loading calculation listed the worst-case fire duration for a fire in Fire Areas 6 and 36A to be 48 minutes and 41 minutes, respectively. Reactor coolant makeup would not be required for approximately 82 minutes after fire damage occurs. Since Fire Areas 6 and 36A have automatic detection, a fire could be detected and extinguished by the fire brigade prior to additional makeup capability being required. Additionally, Fire Area 36A is also protected by an automatic Halon fire suppression system. Operators would have sufficient time to diagnose the problem and perform manual actions to restore charging even if the actions required entering a fire affected area (Fire Area 6). Thus, the team determined that the risk of this finding was very low (green).

Enforcement: License Condition D of the facility operating license states that the licensee will implement and maintain in effect all provisions of the NRC-approved fire protection program, as described in the Updated Safety Analysis Report and as approved in NRC safety evaluation reports. In the Fort Calhoun Station Updated Safety Analysis Report, the licensee committed to 10 CFR Part 50, Appendix R, Section III.G, III.J, and III.O. Section III.G.2 of Appendix R to 10 CFR Part 50 describes three methods acceptable for ensuring that at least one train of redundant safe shutdown equipment is free of fire damage: (a) redundant trains be located in different fire areas separated by 3-hour rated fire barriers; (b) redundant trains in the same fire area be separated by 20 feet of horizontal distance with no intervening combustible or fire hazards, and the fire area be equipped with area-wide detection and suppression; or (c) one redundant train be separated from the other redundant trains by enclosing it in a 1-hour fire rated barrier, and the fire area be equipped with area-wide detection and suppression. However, the licensee failed to maintain one train of the charging system free of fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2 and committed to in the Updated Safety Analysis Report. This is a violation of Appendix R, Section III.G.2. This violation is being treated as a noncited violation consistent with Section VI.A of the NRC Enforcement policy (NCV 50-285/0302-01).

Upon identification of this finding, the licensee implemented interim actions to institute an hourly fire watch in Fire Areas 6 and 36A, and alert operators to the potential for gas binding of the charging pumps. The team considered these interim actions to be acceptable. The licensee entered this finding into their corrective action program as Condition Report 200204316. In addition, the licensee had initiated Condition Report 200204129 to review and resolve any issues concerning the use of manual operator actions. Actions to be taken under this condition report are the review of operator actions including timing, resource requirements, operator knowledge/training, and feasibility.

.3 Alternative Safe Shutdown Capability and Implementation

a. Inspection Scope

The team reviewed the systems required to achieve alternative safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions from the remote shutdown panel and alternate shutdown locations. The team also focused on the adequacy of the systems to perform reactor pressure control, reactor makeup, decay heat removal, process monitoring, and support system functions. The team reviewed Abnormal Operating Procedure AOP-6, "Fire Emergency," Revision 10, which would be used by operators to shut down the reactor in the event of a control room fire that required evacuation of the control room. The team also timed licensed and non licensed personnel as they stepped through the procedure, to determine its adequacy to direct safe shutdown from remote shutdown locations.

b. Findings

No findings of significance were identified.

.4 Emergency Communications

a. Inspection Scope

The team reviewed the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties. The team verified that adequate communication equipment was available consistent with the licensing basis. The team performed a review of the electrical power supplies and cable routing for the radio repeater system.

b. Findings

No findings of significance were identified.

.5 Emergency Lighting

a. Inspection Scope

The team reviewed the emergency lighting system required for safe shutdown activities to verify that it was adequate for supporting the performance of manual actions required to achieve and maintain hot shutdown conditions, and for illuminating access and egress routes to the areas where manual actions are required.

b. Findings

No findings of significance were identified.

.6 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed Abnormal Operating Procedure AOP-6, "Fire Emergency," Revision 10, to determine whether repairs were required to achieve cold shutdown and to verify that the required material was available.

b. Findings

No findings of significance were identified.

.7 Fire Protection Systems, Features, and Equipment

a. For the selected fire areas, the team evaluated the adequacy of fire protection features, such as fire suppression and detection systems, fire area barriers, penetration seals, and fire doors. To do this, the team observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the team reviewed license documentation, such as NRC safety evaluation reports and deviations from NRC regulations and the National Fire Protection Association code to verify that fire protection features met license commitments.

b. Findings

No findings of significance were identified.

.8 Compensatory Measures

a. Inspection Scope

The team verified, by sampling, that adequate compensatory measures were put in place by the licensee for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems or features (e.g., detection and suppression systems, or passive fire barrier features).

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

On December 20, 2002, at the conclusion of the team's onsite inspection, the team leader debriefed Mr. R. Ridenoure, Division Manager - Nuclear Operations, and other licensee management on the triennial fire protection inspection results.

On January 17, 2003, the team leader conducted an onsite exit meeting with

Mr. R. Clemens, Division Manager - Nuclear Assessments and Mr. R. Phelps, Division Manager, Nuclear Engineering, and other licensee management and staff members, during which the results of the triennial fire protection inspection were characterized.

The licensee was asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT

KEY POINTS OF CONTACT

Licensee

D. Bannister, Plant Manager
J. Brown, Shift Manager, Operations Engineering
D. Buell, Program Engineer, Fire Protection
R. Clemens, Division Manager, Nuclear Assessments
K. Erdman, Project Manager, Nuclear Projects
T. Leibel, Engineer, Design Engineering
E. Matzke, Station Licensing Engineer
R. Phelps, Division Manager, Nuclear Engineering
R. Ridenoure, Division Manager, Nuclear Operations
C. Sterba, System Engineer

NRC

J. Kramer, Senior Resident Inspector

ITEM OPENED AND CLOSED

Opened and Closed During this Inspection

50-285/02-01	NCV	Failure to maintain one train of charging free of fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2 (Section 1R05.2)

DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

DRAWINGS

Drawing Number	Description/Title	Revision
8.1-1	Simplified One Line Diagram Plant Electrical System P & ID	99
174B9009	Elementary Diagram Plant Communications AI-53	6
11405-E-9 Sheet 3	120 Volt AC Instrument Busses One Line Diagrams P & ID	28
11405-MECH-1	Symbol List P & ID	24
11405-M-2 Sheet 3	Auxiliary Building Heating and Ventilation Flow Diagram P & ID	51
11405-M-10 Sheet 1	Auxiliary Coolant Component Cooling System Flow Diagram P & ID	65
11405-M-10 Sheet 3	Auxiliary Coolant Component Cooling System Flow Diagram P & ID	12
11405-M-10 Sheet 4	Auxiliary Coolant Component Cooling System Flow Diagram P & ID	7
11405-M-40 Sheet 1	Auxiliary Coolant Component Cooling System Flow Diagram P & ID	33
11405-M-97 Sheet 1	Misc. Heating, Ventilating & Air Conditioning Flow Diagram P & ID	56
11405-M-97 Sheet 2	Misc. Heating, Ventilating & Air Conditioning Flow Diagram P & ID	4
11405-M-100	Raw Water Flow Diagram P & ID	71
11405-M-252 Sheet 1	Flow Diagram Steam P & ID	88
11405-M-253 Sheet 1	Flow Diagram Steam Generator Feedwater and Blowdown P & ID	85
11405-M-253 Sheet 3	Flow Diagram Steam Generator Feedwater and Blowdown P & ID	7

Drawing Number	Description/Title	Revision
11405-M-253 Sheet 4	Flow Diagram Steam Generator Feedwater and Blowdown P & ID	26
11405-M-254 Sheet 2	Flow Diagram Condensate P & ID	21
11405-M-262 Sheet 1	Fuel Oil Flow Diagram P & ID	48
11405-M-266 Sheet 1	Fire Protection Flow Diagram P & ID	75
11405-M-266 Sheet 1A	Fire Protection Flow Diagram P & ID	13
11405-M-266 Sheet 1B	Fire Protection Flow Diagram P & ID	19
41716	Fort Calhoun Station Radio System Block Diagram	1
B-4250 Sheet 3	Emergency Lighting Routing	1
B-4250 Sheets 3A & 3B	Cable Block Diagram Emergency Lighting Sheets #1 & #2	1
C-4224 Sheet 1	Power Feed for Head Amplifier Cabinet AI-130, Paging Transmitter cabinet AI-129 and Control Room Handsets	0
D-4078	Reactor Coolant Gas Vent System P & ID	14
D-4094 Sheet 1	Fire Detection System Ground Floor Plan	6
D-4094 Sheet 2	Fire Detection System Basement Floor Plan Elevation 995'-6"	2
D-4094 Sheet 5	Fire Detection System Turbine Building Elevation 990'-0"	2
D-4094 Sheet 6	Fire Detection System Turbine Building Elevation 1011'-0"	4
D-4094 Sheet 7	Fire Detection System Turbine Building Elevation 1036'-0"	2
D-4769 Sheet1 1-5	Emergency Lighting and manual Action Plan for Fire Safe Shutdown	0
E-4144	FW-10 Lube Oil Schematic P & ID	2

Drawing Number	Description/Title	Revision
E-23866-210-110 Sheet 1	Reactor Coolant System Flow Diagram P & ID	71
E-23866-210-110 Sheet 1A	Reactor Coolant System Flow Diagram P & ID	6
E-23866-210-120 Sheet 1	Chemical and Volume Control System P & ID	64
E-23866-210-120 Sheet 1A	Chemical and Volume Control System P & ID	7
E-23866-210-121 Sheet 1	Chemical and Volume Control System P & ID	39
E-23866-210-121 Sheet 1	Chemical and Volume Control System P & ID	10
E-23866-210-130 Sheet 1	Safety Injection and Containment Spray System Flow Diagram P & ID	73
E-23866-210-130 Sheet 2	Safety Injection and Containment Spray System Flow Diagram P & ID	55
E-23866-210-130 Sheet 2A	Safety Injection and Containment Spray System Flow Diagram P & ID	6
E-23866-210-130 Sheet 2B	Safety Injection and Containment Spray System Flow Diagram P & ID	5
E-23866-210-130 Sheet 3	Safety Injection and Containment Spray System Flow Diagram P & ID	9

CONDITION REPORTS (CRs)

200000253	200002266	200100720	200101296	200102553	200102967
200102982	200200175	200200326	200201482	200203067	200203080
200203221	200203259	200203431	200203675	200203848	200204129
200204147	200204302	200204304	200204306	200204315	200204316
200300141					

ENGINEERING ANALYSES

Number	Title	Revision
EA-FC-89-055	10 CFR 50 Appendix R Safe Shutdown Analysis	11
EA-FC-91-022	Electrical Penetration Details, Pages 18 - 24	6
EA-FC-91-084	Breaker Fuse Coordination Study	5
EA-FC-97-001	Fire Hazards Analysis (FHA) Manual	3
EA-FC-97-043	Fire Safe Shutdown for Control Room Evaluation Design Basis Analysis	1
EA-FC-97-044	10CFR50 Appendix R Cable Identification	4
EA-FC-98-001	Fire Barrier Evaluation for HVAC Penetrations	1
EA-FC-98-004	Fire Barrier Evaluation for 86-10 Conduit Seals	2
EA-FC-98-005	Fire Barrier Evaluation for 86-10 Miscellaneous Penetrations	3
EA-FC-99-002	Appendix R Safe Shutdown Validation	0

PROCEDURES

Number	Title	Revision
AOP-6	Fire Emergency	10
EOP-00	Standard Post Trip Actions	15
EOP-20	Functional Recovery Procedure	8
SO-G-28	Station Fire Plan	53
SO-G-58	Control of Fire protection System Impairments	30
SO-G-91	Control and Transportation of Combustible Materials	17
SO-G-102	Fire Protection Program Plan	4
SO-G-103	Fire Protection Operability Criteria and Surveillance Requirements	14

MISCELLANEOUS

Appendix R Logic Diagrams for Fire Areas 6, 36A, and 46

Calculation FC06355, "10 CFR 50 Appendix R Functional Requirements and Component Selection," Revision 6

Design Basis Document SDBD-FP-115, "Fire Protection," Revision 16

Fire Protection Program Safety Evaluation Report Review - Final Report, dated September 17, 2001

Fire Protection Program Emergent Quality Assurance Surveillance Report 25(E)-0102, Room 22 Fire, dated January 15, 2002

Fire Protection Program Emergent Quality Assurance Surveillance Report 25(E)-0302, Fire Protection Procedures and Corrective Actions, dated March 26, 2002

Fire Protection Program Self Assessment, dated June 2002

Fire Protection Program Emergent Quality Assurance Surveillance Report 25(E)-0802, Fire Brigade, dated August 26, 2002

Fire Protection Program SARC Audit Report No. 25/25A, Fire Protection/Loss Prevention (Annual), dated October 24, 2002

Fort Calhoun Station Operating License, Amendment No. 199

Fort Calhoun Station Updated Safety Analysis Report, Revision 8

Instructor Handbook, Emergency Fire Procedure AOP-6, Lesson Plan 7-17-6, Revision 13, Licensed Operator (RO & SRO) Training Program

Instructor Handbook, Emergency and Abnormal Operating Procedures, Lesson Plan 4-6-8, Revision 43, Non-Licensed Operator (AON) Training Program

Instructor Handbook, Emergency and Abnormal Operating Procedures, Lesson Plan 4-20-8, Revision 2, Non-Licensed Operator (EONT) Training Program

Instructor Handbook, Emergency and Abnormal Operating Procedures, Lesson Plan 4-40-10, Revision 3, Non-Licensed Operator (EONA) Training Program

Letter LIC-78-025, dated February 14, 1978, addressed to Mr. Theodore E. Short, Division Manager - Production Operations, OPPD from George Lear, Chief, Operating Reactors Branch #3, Office of Nuclear Reactor Regulation; Subject: Amendment No. 38 to Operating License

Letter LIC-78-122, dated August 1, 1978, addressed to Mr. Robert W. Reid, Chief, Operating Reactors Branch No. 2, Office of Nuclear Reactor Regulation from T. E. Short, Division Manager, Production Operations; Subject: Status of Certain Issues in Regard to the Fort Calhoun Station Fire protection Program

Letter LIC-78-104, dated August 23, 1978, addressed to Mr. Theodore E. Short, Division Manager - Production Operations, OPPD from Robert W. Reid, Chief, Operating Reactors Branch #4, Office of Nuclear Reactor Regulation; Subject: Amendment No. 40 to Operating License

Letter LIC-79-192, dated July 9, 1979, addressed to Mr. Robert W. Reid, Chief, Operating Reactors Branch No. 4, Office of Nuclear Reactor Regulation from T. E. Short, Assistant General Manager; Subject: Response to Conference Call

Letter LIC-80-006, dated January 18, 1980, addressed to Mr. Robert W. Reid, Chief, Operating Reactors Branch No. 4, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: Status of Facility Modifications for Fire Protection

Letter LIC-80-013, dated February 8, 1980, addressed to Mr. Robert W. Reid, Chief, Operating Reactors Branch No. 4, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: Status of Two Facility Modifications for Fire Protection

Letter LIC-80-062, dated May 20, 1980, addressed to Mr. Robert A. Clark, Chief, Operating Reactors Branch No. 3, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: Response to NRC Questions, Cable Separation

Letter LIC-80-213, dated November 17, 1980, addressed to Mr. W. C. Jones, Division Manager - Production Operations, OPPD from Robert A. Clark, Chief, Operating Reactors Branch #3, Office of Nuclear Reactor Regulation; Subject: Amendment No. 53 to Operating License

Letter LIC-81-042, dated March 27, 1981, addressed to Mr. Robert A. Clark, Chief, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: Response to NRC Questions, Post Fire Safe Shutdown Capability

Letter LIC-82-060, dated April 8, 1982, addressed to Mr. W. C. Jones, Division Manager - Production Operations, OPPD from Thomas M. Novak, Assistant Director for Operating Reactors, Office of Nuclear Reactor Regulation; Subject: Safety Evaluation Report for Alternative safe Shutdown

Letter LIC-82-149, dated August 12, 1982, addressed to Mr. W. C. Jones, Division Manager - Production Operations, OPPD from Robert A. Clark, Chief, Operating Reactors Branch #3, Office of Nuclear Reactor Regulation; Subject: Response to Three Open Items on Fire Protection Rule

Letter LIC-82-206, dated May 25, 1982, addressed to Mr. Robert A. Clark, Chief, Operating Reactors Branch No. 3, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: 10 CFR 50, Appendix R Requirements

Letter LIC-83-219, dated August 30, 1983, addressed to Mr. Robert A. Clark, Chief, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from W. C. Jones, Division Manager, Production Operations; Subject: Request for Exemptions from Various Requirements of 10 CFR 50, Appendix R, Fire Protection Program for Nuclear Power Facilities

Letter LIC-84-338, dated January 9, 1985, addressed to to Mr. James R. Miller, Chief, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation from R. L. Andrews, Division Manager, Production Operations; Subject: 10 CFR 50, Appendix R Exemption Request Revisions

Letter LIC-85-200, dated July 3, 1985, addressed to Mr. R. L. Andrews, Division Manager - Nuclear Operations, OPPD from Edward J. Butcher, Acting Chief, Operating Reactors Branch #3, Office of Nuclear Reactor Regulation; Subject: Granting of Fire Protection Exemptions

Letter, dated May 16, 2002, from J. Hannon (NRC) to A. Marion (NEI) Subject: Use of Manual Actions to Achieve Safe Shutdown for Fire Events

Phase II Response to Generic Letter 88-20, Supplement 4, Individual Plant Examination of External Events (IPEEE), dated June 30, 1995

Training Guide for Teledyne Big Beam S6 Series Seismic Rated Emergency Lights