

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/82-14(DE)

Docket No. 50-483

License No. CPPR-139

Licensee: Union Electric Company
Post Office Box 149
St. Louis, MO 63166

Facility Name: Callaway Nuclear Plant, Unit 1

Inspection At: Callaway Site, Callaway County, MO

Inspection Conducted: November 1 - 5, 1982

Inspectors: *G. Ramsey*
C. Ramsey

3/25/83

J. Ulie
J. Ulie

3/25/83

Approved By: *G. C. Williams*
G. C. Williams, Chief
Engineering Inspection Branch

3/25/83

Inspection Summary

Inspection on November 1 - 5, 1982 (Report No. 50-483/82-14(DE))

Areas Inspected: The inspectors examined the licensee's fire protection and prevention program including current proposed fire protection administrative controls, surveillance procedures and technical specifications, fire suppression system design hydraulic calculations, followup on commitments made to NRR, presently completed pre-operational (startup) testing, construction and proposed operations fire brigade training program. The inspection involved 72 inspector-hours onsite by two NRC inspectors.

Results: Of the five areas inspected, no apparent violations were identified in four areas; two apparent violations were identified in one area (inadequate missile resistant door fire rating documentation - paragraph 2; inadequate fire door rating documentation - paragraph 2).

DETAILS

1. Persons Contacted

D. Poole, Advisor to Manager, Callaway Plant
P. Appleby, Assistant Manager Support
H. Millwood, QA Construction
L. Kanuckel, Assistant QA Engineer (Construction)
F. Young, Safety Supervisor
E. Faenger, Construction Engineer
J. Gunter, Assistant Construction Engineer
B. Dampf, Safety Coordinator
J. Laux, Supv. Engineer - QA Startup
G. Polowy, QA Assistant Engineer
J. Kailin, Supt. of Startup
P. Suydam, QA Engineer (Operations)
W. Petrie, Project QA Engineer
S. Hogan, QA Engineer

The inspectors also talked with several other licensee employees, including members of the construction and operations staff.

All of the above persons were present at the exit interview on November 5, 1982.

2. Administrative, Surveillance, and Technical Specification Procedures

The inspectors reviewed the licensee's fire protection administrative controls, surveillance and technical specification procedures which included fire doors, main fire loop ring header isolation valves, fuel handling building fire protection equipment, fire pump testing, general employee training program, transient fire loading, and welding procedures.

a. Areas of Inspection

(1) Construction Procedures

<u>Number</u>	<u>Revision Date</u>	<u>Title</u>
AP-III-02	10-26-82	Quality Assurance Audit Planning and Scheduling
AP-IV-08	2-20-82	Fire Protection Submittals and Corre- spondence
AP-VII-02	7-29-82	Nonconformance Control and Reporting

AP-VII-05	12-22-81	Supervising Examination Testing and Inspection Activities
AP-IX-02	9-27-82	Material and Equipment Receiving
AP-IX-03	6-22-81	Identification and Marking Verification
AP-XIV-01	9-28-82	Construction Site Safety
AP-XIV-03	9-29-81	Fire Prevention, Protec- tion, and Control
WP-09	6-4-76	Safety for the On Site Welding, Cutting, and Heating Operations
WP-130	4-13-82	Inspection of Fire-Rated Hollow Metal and Rolling Doors
WP-301	8-4-82	Installation of Electrical Raceway Supports
4645-P23-4	7-8-77	Technical Specification for Fire Water Make-Up Pump
4645-P23-5	11-17-76	Technical Specification for Freeze Protection Circu- lating Pumps
4645-P23-6	7-27-77	Technical Specification for Pipe and Fittings-Fire Protection System
4645-P23-7	2-1-78	Technical Specification for Post Indicator Valves- Fire Protection System
4645-P23-8	3-20-78	Technical Specification for Fire Hydrants - Fire Pro- tection System
4645-P23-10	7-7-77	Technical Specification for Accumulator Tank - Fire Protection System

QCP-108

6-2-82

Inspection of Civil Seismic
II/I, Group D Augmented, and
Fire Protection Installations

(2) Construction Specification

<u>Number</u>	<u>Revision Date</u>	<u>Time</u>
4645-23A	6-11-82	Technical Specification for Fire Pumps and Accessories

(3) Procurement Specification

<u>Number</u>	<u>Revision Date</u>	<u>Title</u>
4645-P23-1	2-8-78	Technical Specification for Fire Pumps and Accessories
4645-P23-2	5-10-77	Technical Specification for Fire Protection Water Storage Tanks
4645-P23-3	7-7-77	Technical Specification for Fire Water Storage Tank Sub- merged Heaters
4645-P23-11	11-10-76	Technical Specification for Air Compressor - Fire Pro- tection System
4645-P23-16	11-21-77	Technical Specification for Shutoff Valves, Valve Boxes and Wrenches - Fire Protection System

(4) Records

<u>Number</u>	<u>Revision Date</u>	<u>Title</u>
8600-X-88773	12-4-81	Loop and Laterals (switchyard)
8600-X-88439	3-1-82	Piping Flow Diagram (Pumphouse and Storage Tank)
8600-X-88448	12-4-81	Piping Plans - Fire Loop and Laterals (Unit 1)
2-343-P	7-28-80	East Turbine Building Loop Tie-in, Fire Protection System, Field Change Request

(5) Reports

<u>Number</u>	<u>Revision Date</u>	<u>Title</u>
WP-204	8-6-89	Hydrostatic and Pnuematic Test Report
M03-KC06	10-15-79	Field Sketch, Mechanical

(6) Proposed Technical Specifications

<u>Number</u>	<u>Revision Date</u>	<u>Title</u>
3/4.7.10	11-82	Fire Suppression Water System
3.7.10.2	11-82	Spray and/or Sprinker System
3.7.10.3	11-82	Halon Systems
3.7.10.4	11-82	Fire Hose Stations
3/4.7.11	11-82	Fire Barrier Penetrations

(7) Plant Tours

The inspectors examined fire protection water supply piping configurations, penetration fire barriers, and fire pump equipment during tours of the following areas:

- Pump House
- Plant Yard
- Fuel Handling Building

b. Findings

Noncompliance (483/82-14-01a) Missile/fire resistant door ratings. Paragraph C.3 of Enclosure B to Union Electric Company Letter Number ULNRC-271, dated July 5, 1978 states, "Receipt inspection or performance testing will verify that material, equipment and services pertaining to the site related portions of the fire protection system conform to procurement documents."

Union Electric Drawing Number A-0907, Revision 14 requires Class A (three hour rated) fire doors on the reactor control room. According to the licensee, missile resistant Door Number 36042 is to be installed on the reactor control room.

Union Electric Procurement Specification Number 10466-A-076, Revision 2, Paragraph 5.1.2(e) specifies, "Certification of compliance stating that the missile resistant door assemblies

meet the requirements of ASTM E-152 for the rating specified in Appendix B."

Appendix B to Procurement Specification Number 10466-A-076 indicates that the fire rating of the missile resistant Door Number 36042 will be of Class A construction. The licensee provided a certificate of compliance from the door manufacturer for the design and construction of this door stating, "This is to certify that Door Number 36042 complies to the requirement of ASTM E-152 and for the fire rating Class A construction."

Contrary to the above, the door manufacturer indicated to one of the inspectors on November 15, 1982, that the missile resistant type doors specified had not been tested to meet the requirements of ASTM E-152. Missile resistant Door Number 36042 had not been tested in accordance with Union Electric Company Procurement Specification 10466-A-076, Revision 2, Paragraph 5.1.2.(e), in that no acceptable documentation was available for the inspectors review to indicate that this door met the test requirements of ASTM E-152 for a Class A (3 hour fire rating) door. No permanently affixed fire rating label was observed on the door by the inspectors.

This represents a violation of 10 CFR 50, Appendix B, Criterion VII, to assure that purchased material, equipment, and services conform to the procurement documents.

Noncompliance (483/82-14-01b) Hollow Metal Fire Door Ratings. Regarding Quality Assurance for Hollow Metal Fire Doors, the inspectors determined the following:

- (1) Paragraph C.3 of Enclosure B to Union Electric Company Letter Number ULNRC-271, dated July 5, 1978 states, "Receipt inspection or performance testing will verify that material, equipment and services pertaining to the site related portions of the fire protection system conform to procurement documents." The following documents establish requirements for the fire doors in the fire pumphouse.
 - (a) Union Electric's final safety analysis report (SNUPPS Standardized Nuclear Unit Power Plant System) Revision 1, dated September 1980, Paragraph 9.5.1.2.2, titled, "Fire Barriers," states in part, "All penetrations through the fire barriers are fitted with fire stops having, as a minimum, the same rating as the barrier. Personnel doors have the same rating as the barriers..."
 - (b) Union Electric to NRC letter dated July 5, 1978, Item 1, states, "Each fire pump is separated by three hour rated fire walls." This would imply that fire doors in these walls have the same rating as the wall (i.e., 3 hour rated).

- (c) Design Package 23, Drawing Number 8600-X-8846, Revision 3, doors numbered 4 and 5 separating each pump in the fire pump house identified these doors as 3 hour fire rated.
- (d) Union Electric Specification Number 4645-23A, Revision 1, Paragraph 5.8, states as noted on the drawings, provided that such doors conform to U.L. requirements for label class required, "Label shall be permanently attached to door."

Contrary to the above, fire doors numbered 4 and 5 to the fire pumphouse failed to meet the acceptance criteria in accordance with Design Package 23, Drawing Number 8600-X-8846, Revision 3.

- (2) Regarding fire door #33011 at elevation 2000' of the auxiliary building, the following documents establish the requirements.

- (a) Union Electric's fire hazards analysis, Appendix 9.5B, Fire Area 17, Paragraph A.17.2 states in part, "This fire area is separated from all adjoining areas and buildings by 3 hour rated fire barriers."
- (b) Union Electric Contractor, Daniel International Quality Control Construction Procedure Number QCP-108, Exhibit C, Revision 1, titled, "Fire Rated Hollow Steel Door and Frame Checklist," stated in part, "Doors requiring U.L. requirements have labels permanently attached."
- (c) Design Package 23, Drawing Number 8600-X-8846, Revision 3, identifies Door Number 33011 between the switchgear rooms in the communications corridor of the auxiliary building at elevation 2000 as a 3 hour fire rated door.
- (d) Union Electric Specification Number 4645-23A, Revision 1, Paragraph 5.8, states in part, "Labeled doors shall be furnished as noted on the drawings, provided that such doors conform to U.L. requirements for label class required. Label shall be permanently attached to door."

Contrary to the above, fire door numbered 33011 failed to meet the acceptable criteria in accordance with Design Package 23, Drawing No. 8600-X-8846, Revision 3, in that no documentation was available nor were labels affixed for the inspectors review to indicate that these doors conformed to U.L. requirements as required by Paragraph 5.8 of Specification Number 4645-23A, Revision 1.

These examples represent a violation of 10 CFR 50, Appendix B, Criterion VII, to assure that purchased material, equipment, and services conform to the procurement documents.

c. Discussion

Open (483/82-14-02) Fire Pump Testing. In response to issues raised by the NRC concerning fire pump installation and testing, Union Electric's letter of July 5, 1978 (UENRC-271) states "fire pumps and controllers are Underwriters Laboratories and Factory Mutual rated. Controllers and pumps will be installed and tested in accordance with NFPA 20-1974." NFPA 20-1974 specifies a field acceptance test upon completion of the entire fire pump installation. The field acceptance test results are required to be as good as the manufacturer's certified shop test characteristic curve for the pump being tested. A yearly test is required at full capacity of not less than 150 percent of rated capacity at a total head not less than 65 percent of total rated head. The shut off head for horizontal split case pumps should not exceed 120 percent of rated head. During such tests, intermediate points such as voltage, current (amps), pump speed (rpm), pump suction, discharge and net discharge pressures should be measured. Comparing the results of these measurements to pump ratings, the manufacturers certified shop test characteristic curve and the acceptance test results enables determination of actual pumps field performance characteristics.

Notwithstanding the above, the proposed operating technical specifications for the Callaway plant requires fire pump testing every 18 months at 100% of rated capacity and 100% of total rated head. The testing method does not specify measurement of intermediate points such as pump speed (rpm's), current, suction and discharge pressures to compare fire pump performance to the original acceptance test and manufacturers shop test results.

Testing fire pumps to 100 percent of rated capacity at 100 percent of total rated head will not verify the availability of the maximum required flow for automatic sprinklers. The maximum system demand for automatic sprinklers at elevation 2033-0 (North) of the turbine building is 2300 gallons per minute plus 1000 gallons per minute for outside hose streams. The total required flow is 3300 gallons per minute. Any two fire pumps installed at the Callaway plant, operating at 100 percent of rated capacity will deliver only 3000 gallons per minute.

This is a generic problem presently under study by the NRC.

Open Item (483/82-14-03) Fire loop main ring header isolation valves. Page 9.5.1-13 of the SNUPPS FSAR and Union Electric Co's response to water sprinklers and hose standpipe systems specifies that "A management supervision program is provided for the fire protection system valves. Valves that are not electrically supervised with indications in the control room are locked in the proper position with a strict key control system, including the use of tamper-proof seals and periodic visual checks."

At the time of this inspection, the three main ring header isolation valves for the fire pumps discharge into the system were not locked in the open position, were not provided with tamper proof seals and no procedure was in effect to verify periodic inspection.

These controls are required once fuel is stored at the site in order to satisfy Special Nuclear Materials License No. SMN-1901.

Open Item (483/82-14-04) Fuel handling building fire protection equipment. According to Special Nuclear Materials License No. SNM-1901 for Union Electric's Callaway Plant, Unit 1, adequate fire protection will be provided as specified in the licensee's application dated June 26, 1981 and supplements dated February 5 and 18, May 13, July 28 and August 11, 1982.

Interviews with plant personnel indicated that new fuel was expected on site a few days subsequent to this inspection.

During this inspection it was determined that the required fire protection equipment in the fuel handling building was not operable due to the following:

- (1) Numerous fire hose stations were found in improper operating condition due to hose nozzles in the open position and racked hose being wrapped with tape, preventing the hose to be freely pulled from the rack to a fire scene.
- (2) All 2 1/2 gallon pressurized water portable extinguishers were found to have unsealed pull pins, denoting uncertainty as to whether or not they had been used.
- (3) Numerous fire doors were found in the unlatched position due to recessed or inoperative latching mechanisms. A condition that compromises the level of protection required of these doors.

All these items need be corrected prior to the receipt of fuel at the site.

Open Items (483/82-14-05) Fire protection administrative and surveillance testing procedures. The inspectors reviewed the licensee's proposed fire protection administrative and surveillance testing procedures. The procedure did not specifically address administrative control of transient fire loading (AP-22-00741), a permit system for control of hot works operations and surveillance of penetration fire barriers (fire doors, dampers and cable penetration seals). The licensee was advised that administrative controls and surveillance testing procedures should as a minimum, conform to the nuclear plant fire protection functional responsibilities, administrative controls and quality assurance, and the applicable National Fire Protection Association codes referenced in the SNUPPS FSAR.

Open Item (483/82-14-06) Fire protection training. The inspectors reviewed the licensee's proposed general employee training film in fire protection. The licensee was advised that the observed training film did not appear to satisfy the NRC training requirements for personnel performing fire watches and fire brigade members. This training should conform as a minimum to the requirements specified in National Fire Protection Code Pamphlet 27 as indicated in the SNUPPS FSAR.

3. Fire Suppression System Design Hydraulic Calculations

The inspectors reviewed the licensee's fire suppression systems design hydraulic calculations which included the turbine building, fuel building, diesel generator rooms, and main power transformers.

a. Areas of Inspection

(1) Analytical Test Status

<u>Number</u>	<u>Date</u>	<u>Title</u>
10466-M-650-0058-01	3-12-79	Main Power Transformer A, B, and C
10466-M-650-0072-02	5-14-80	Turbine Building EL. 2033'-0 North
10466-M-650-0073-02	5-14-80	Turbine Building EL. 2033'-0 North
10466-M-650-0076-02	11-11-81	Turbine Building El. 2033'-0 South
10466-M-650-082-02	12-15-81	Diesel Generator Building, West System
10466-M-650-085-02	12-15-81	Fuel Building Railroad Bay El. 2000'-0
10466-M-650-0113-01	11-3-80	Diesel Generator Building, East System
10466-M-650-0046-01	12-1-80	Flow Calculations for All Hazards

(2) Plant Tours

The inspectors conducted a tour of the plant facilities to determine the completeness of the licensee's fire suppression systems. The inspectors will continue this review on subsequent inspections.

No items of noncompliance or deviations were identified.

4. Followup on Commitments Made to NRR

The inspectors initiated review of a selected number of the licensee's responses made to NRR concerns. The inspectors will continue this review on subsequent inspections.

Open Item (50-483/82-14-07) Followup on commitments made to NRR. Licensee transmittal dated July 5, 1978, in Item 4 refers to licensee followup needed to resolve NRR concerns. The inspectors attempted to determine the status of this previously raised concern but were unable to followup on the current status with available personnel at the site. The licensee was unable to present documentation demonstrate the fire resistant rating of the installed fire stops. This issue raised by NRR will be addressed during subsequent inspections with corporate and site based licensee personnel.

No items of noncompliance or deviations were identified.

5. Preoperational Test Program

The inspectors reviewed portions of the presently completed pre-operational procedures for technical content and to familiarize themselves with procedures governing the facilities startup and preoperational testing phase program. The inspectors will continue this review on subsequent inspections.

No items of noncompliance or deviations were identified.

6. Fire Brigade Training Program

The inspectors reviewed the licensee's development of operations fire brigade training program which included the fire protection organization, fire brigade training, fire brigade self contained breathing apparatus, quality assurance, control of combustibles and ignition sources, and fire fighting procedures.

The inspectors informed the licensee that improvement is needed in the control and comprehensiveness of the fire protection program after areas and/or equipment are turned over to operations.

a. Areas of Inspection

(1) Records

<u>Number</u>	<u>Date</u>	<u>Title</u>
SSA-3564	9-16-82	Inventory of Fire Equipment
SSA-3553	8-24-82	Monthly Fire Brigade Training Session/Industrial Brigade (Ordinary Combustible Training)

SSA-3575	10-6-82	Monthly Training Session/ Industrial and Security Fire Brigade (Assisting in Dirst- Aid Operations)
SSA-3547	8-17-82	Outside Assistance/Fire Emergencies (Offsite Fire Department Assistance)

(2) Plant Tours

The inspectors examined fire brigade's self contained breathing apparatus during tours of the plant facilities on November 3 and 4, 1982.

No items of noncompliance or deviations were identified.

7. Exit Interview

The inspectors met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on November 5, 1982. The inspectors summarized the purpose and scope of the inspection and discussed the findings. The licensee acknowledged the statements made by the inspectors with respect to the items of noncompliance in Paragraph 2.b. Subsequent finding regarding the Certificate of Compliance for fire door no. 36042 were discussed with the licensee by telephone on March 28, 1983.