

November 30, 1977

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Dockets Nos.: 50-280  
and 50-281 ✓

Virginia Electric & Power Company  
ATTN: Mr. W. L. Proffitt  
Senior Vice President - Power  
P. O. Box 26666  
Richmond, Virginia 23261

Gentlemen:

The Commission has issued the enclosed Amendments Nos. 34 and 33 to Facility Operating Licenses Nos. DPR-32 and DPR-37 for the Surry Power Station Units Nos. 1 and 2, respectively. These amendments consist of changes to the Technical Specifications in response to your application dated December 31, 1976, as revised August 1, 1977.

These amendments incorporate fire protection Technical Specifications on the existing fire protection equipment and administrative controls at the facilities, which were agreed to by your staff in discussions with the NRC staff.

In order to provide a period of time to modify procedures to conform with the details of the enclosed interim Technical Specifications and to complete required personnel training where necessary, the amendments become effective 30 days after the date of issue.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Robert W. Reid, Chief  
Operating Reactors Branch #4  
Division of Operating Reactors

Enclosures:

1. Amendment No. 34 to DPR-32
2. Amendment No. 33 to DPR-37
3. Safety Evaluation

\*SEE PREVIOUS YELLOW FOR CONCURRENCE

ORB#4:DOR

RIngram\*

11/21/77

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OPA, Clare Miles  
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4. Notice

cc w/enclosures: See next page

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Virginia Electric & Power Company

cc w/enclosure(s):

Michael W. Maupin, Esq.  
Hunton, Williams, Gay & Gibson  
P. O. Box 1535  
Richmond, Virginia 23213

Mr. Sherlock Holmes, Chairman  
Board of Supervisors of Surry County  
Surry County Courthouse  
Surry, Virginia 23683

Mr. James C. Dunstan  
State Corporation Commission  
Commonwealth of Virginia  
Blandon Building  
Richmond, Virginia 23209

Chief, Energy Systems  
Analyses Branch (AW-459)  
Office of Radiation Programs  
U. S. Environmental Protection Agency  
Room 645, East Tower  
401 M Street, S.W.  
Washington, D.C. 20460

U. S. Environmental Protection Agency  
Region III Office  
ATTN: EIS COORDINATOR  
Curtis Building (Sixth Floor)  
6th and Walnut Streets  
Philadelphia, Pennsylvania 19106

Swem Library  
College of William & Mary  
Williamsburg, Virginia 23185

cc w/enclosure(s) and incoming  
dtd.: 12/31/76 & 8/1/77  
Commonwealth of Virginia  
Council on the Environment  
903 9th Street Office Building  
Richmond, Virginia 23219



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

VIRGINIA ELECTRIC & POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 34  
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric & Power Company (the licensee) dated December 31, 1976, as revised August 1, 1977, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;  
and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

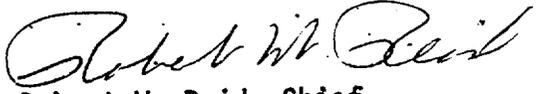
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR- 32 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 34, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment becomes effective 30 days after the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Robert W. Reid, Chief  
Operating Reactors Branch #4  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: November 30, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 34

FACILITY OPERATING LICENSE NO. DPR- 32

DOCKET NO. 50- 280

Revise Appendix A as follows:

Remove Pages

1.0-7

-

-

6.1-2

Figure 6.1-1

Figure 6.1-3

6.1-10 thru 6.1-12

6.4-7c

6.6-16

Insert Pages

1.0-7

3.21-1 thru 3.21-8

4.18-1 thru 4.18-5

6.1-2a

6.1-2b

Figure 6.1-1

Figure 6.1-3

6.1-10 thru 6.1-12

6.4-7c

6.6-16

6.6-17

Changes on the revised pages are shown by marginal lines.

K. Low Power Physics Tests

Low power physics tests conducted below 5% of rated power which measure fundamental characteristics of the core and related instrumentation.

L. Fire Suppression Water System

A Fire Suppression Water System shall consist of: a water source(s); gravity tank(s) or pump(s); and distribution piping with associated sectionalizing control or isolation valves. Such valves shall include yard hydrant curb valves, and the first valve ahead of the water flow alarm device on each sprinkler, hose standpipe or spray system riser.

### 3.21 FIRE DETECTION AND SUPPRESSION SYSTEM

#### Applicability

Applies to the operating status of the Fire Detection and Suppression Systems.

#### Objective

To define those conditions of the Fire Detection and Suppression Systems necessary to insure safe reactor operations.

These conditions relate to: Fire Detection Systems, Plant Fire Suppression Water System, Plant Spray and/or Sprinkler Systems, Plant CO<sub>2</sub> System, Plant Halon System, Plant Fire Hose Stations and Plant Fire Barrier Penetration Fire Seals.

#### Specifications:

##### A. Fire Detection Systems

1. As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.21-1 shall be operable at all times.
2. With the number of operable fire detection instruments less than required by Table 3.21-1.
  - a. Within 1 hour, establish a fire watch patrol to inspect the zone with the inoperable instrument(s) at least once per hour, and
  - b. Restore the inoperable instrument(s) to operable status within 14 days or prepare and submit a special report to the Commission pursuant to Specification 6.6.4 within the next 10 days outlining the cause of the malfunction and the plans for restoring the instrument(s) to operable status.

**B. Plant Fire Suppression Water System**

1. The Fire Suppression Water System shall be operable at all times with:
  - a. (2) high pressure pumps each with a capability of 2,500 gpm. With their discharge aligned to the fire suppression header.
  - b. Separate water supplies each containing a minimum of 250,000 gallons reserved capacity from 300,000 gallon capacity tanks.
  - c. A flow path capable of taking suction from both 300,000 gallon capacity tanks and transferring the water through distribution piping with OPERABLE sectionalizing control or isolation valves to the yard hydrant curb valves and the front valve ahead of the water flow alarm device on each sprinkler, hose standpipe or spray system riser.
  - d. Automatic initiation logic for each fire pump.
2. a. With less than the above required equipment, restore the inoperable equipment to operable status within 7 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.6.4 Within the next 10 days outlining the plans and procedures to be used to provide for the loss of redundancy in this system.
- b. With no Fire Suppression Water System operable, within 24 hours;
  - (1) Establish a backup Fire Suppression Water System.
  - (2) Notify the Commission pursuant to Specification 6.6.4 outlining the actions taken and the plans and schedule for restoring the system to operable status.
3. If 2.b.(1) above cannot be fulfilled, place the reactor in Hot Standby within the next hour and in Cold Shutdown within the following thirty (30) hours.

**Plant Spray and/or Sprinkler Systems**

This section not applicable. Safety and vital areas are not served by water spray systems.

D. Plant CO<sub>2</sub> System

1. The low pressure CO<sub>2</sub> systems shall be operable, with a minimum level of 75% and a minimum pressure of 275 psi in the associated storage tank, at all times when the equipment in the following areas are required to be operable:
  - a. Cable tray rooms
  - b. Cable tunnel
  - c. Cable vault area
  - d. Charcoal filter banks A and B
  - e. Emergency diesel generator rooms 1, 2 and 3
2. The high pressure CO<sub>2</sub> systems shall be operable, with a minimum level of 90% by weight, at all times when equipment in the following areas are required to be operable:
  - a. Fuel oil storage tank room for emergency service water pumps
  - b. Emergency diesel generator fuel oil transfer pump rooms

3. a. With a CO<sub>2</sub> system inoperable, establish a continuous fire watch with backup fire suppression equipment for the unprotected area(s), within 1 hour.
- b. Restore the system to operable status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.6.4 within the next 10 days outlining the cause of inoperability and the plans for restoring the system to operable status.

**E. Plant Halon System**

1. The Halon System shall be operable, with the storage tanks having at least 95% of full charge weight and 90% of full charge pressure, at all times when equipment in the following area is required to be operable:
  - a. Station records storage vault.
2. a. With the Halon System inoperable establish a continuous fire watch with backup fire suppression equipment for the unprotected area, within 1 hour.
- b. Restore the system to operable status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.6.4 within the next 10 days outlining the cause of inoperability and the plans for restoring the system to operable status.

**F. Plant Fire Hose Stations**

1. The following fire hose station shall be operable at all times when

equipment in the area is required to be operable:

<u>LOCATION</u>	<u>SIZE</u>
a. Auxiliary building hose Stations 37 through 51 and 41A	1 1/2"
b. Fuel building hose Stations 52 and 53.	1 1/2"
c. Hose stations 12, 16, 20, 2TA, 22, 23, 33 and 34 in Turbine Building to be used as back- up to control room, emergency switch gear room and diesel generator room.	1 1/2"

2. With a hose station inoperable, route an additional equivalent capacity hose to the unprotected area from an operable hose station within 1 hour.

G. Plant Fire Barrier Penetration Fire Seals

1. All penetration fire barriers protecting safety related areas shall be functional at all times.
2. a. With a penetration fire barrier non-functional, a continuous fire watch shall be established on at least one side of the affected penetration within 1-hour.

Bases

Fire Detection Instrumentation

Operability of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early

stages. Prompt detection of fires will reduce the potential for damage to safety related equipment and is an integral element in the overall facility fire protection program.

In the event that a portion of the fire detection instrumentation is inoperable, the establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is returned to service.

#### Fire Suppression Systems

The operability of the fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in any portion of the facility where safety related equipment is located. The fire suppression system consists of the water system, spray and/or sprinklers, CO<sub>2</sub>, Halon and fire hose stations. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety related equipment and is a major element in the facility fire protection program.

In the event that the fire suppression water systems are inoperable, immediate corrective measures must be taken since this system provides the major fire suppression capability of the plant. The requirement for a twenty-four hour report to the Commission provides for prompt evaluation of the acceptability of the corrective measures to provide adequate fire suppression capability for the continued protection of the nuclear plant.

#### Fire Barrier Penetration Seals

The functional integrity of the fire barrier penetration seals ensures that fires will be confined or adequately retarded from spreading to

adjacent portions of the facility. This design feature minimizes the possibility of a single fire rapidly involving several areas of the facility prior to detection and extinguishment. The fire barrier penetration seals are a passive element in the facility fire protection program and are subject to periodic inspections.

During periods of time when the seals are not functional, a continuous fire watch is required to be maintained in the vicinity of the affected seal until the seal is restored to functional status.

TABLE 3.21-1FIRE DETECTION INSTRUMENTS

<u>Instrument Location</u>	<u>Minimum Instruments Operable</u>	
	<u>Heat</u>	<u>Smoke</u>
1. Containment (Reactor Coolant Pumps only)	1 per RCP	-
* 2. Cable Tray Room	3	4
* 3. Cable Tunnel	2	3
4. Cable Vault Area		
*Lower Area	1	2
Upper Area	1	1
* 5. Charcoal Filter Banks	1 per bank	-
* 6. Emergency Diesel Generator Room	1 per room	-
* 7. Fuel Oil Tank Room (river)	1**	1
* 8. Fuel Oil Transfer Pump Houses	1 per house **	-

\*Allows for one inoperable instrument

\*\*Rate of rise actuation devices for high pressure CO<sub>2</sub> system

## 4.18 Fire Detection and Protection System Surveillance

### Applicability

Applies to periodic testing and surveillance of the Fire Protection System.

### Objective

To verify that the fire protection system will respond promptly and properly when required.

### Specification

#### Test and Frequency

##### A. Fire Detection Instrumentation

1. Each of the fire detection instruments listed in Table 3.21-1 shall be demonstrated operable:
  - a. At least once per 6 months by a channel functional test, and
  - b. At least once per 12 months by performance of a channel calibration.
2. The circuitry associated with the detector alarms shall be demonstrated operable at least once per 6 months for all NFPA Code 72D Class A supervised circuits.
3. The non-supervised circuits between the local panels in Specification 4.18.A.2 and the control room shall be demonstrated operable at least once per 31 days.

##### B. Plant Fire Suppression Water Systems

1. The Fire Suppression Water System shall be demonstrated operable:
  - a. At least once per 7 days by verifying the water supply volume.
  - b. At least once per 31 days on a staggered test basis by starting each pump and operating it for at least 15 minutes on recirculating flow.

- c. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path is in its correct position.
- d. At least once per 12 months by cycling each testable valve through one complete cycle.
- e. At least once per 6 months by performance of a system flush. (if required by local water conditions).
- f. At least once per 18 months:
  - (1) By performing a system functional test which includes simulated automatic actuation of the system throughout its operating sequence and verifying that each automatic valve in the flow path actuates to its correct position.
  - (2) By verifying that each pump develops at least (2500) gpm at a system head of (250) feet.
  - (3) By verifying that each high pressure pump starts (sequentially) to maintain the fire suppression water system pressure equal to or greater than 90 psig.
- g. At least once per 3 years by performing flow tests of the system in accordance with Chapter 5, Section 11 of Fire Protection Handbook, 14th Edition published by National Fire Protection Association.

C. Plant Spray and/or Sprinkler Systems

This section not applicable.

**D. Plant Low Pressure CO<sub>2</sub> Systems**

1. The CO<sub>2</sub> system shall be demonstrated operable:
  - a. At least once per 7 days by verifying each CO<sub>2</sub> storage tank level and pressure.
  - b. At least once per 18 months by verifying the system valves and associated ventilation dampers actuate automatically and manually to a simulated actuation signal. A brief flow test shall be made to verify flow from each nozzle. ("Puff Test").

**E. Plant High Pressure CO<sub>2</sub> Systems**

The CO<sub>2</sub> Systems shall be demonstrated operable:

1. At least once per 6 months by verifying CO<sub>2</sub> storage tank weight.
2. At least once per 18 months by:
  - a. Verifying the system, including associated ventilation dampers, actuates manually and automatically, upon receipt of a simulated test signal, and
  - b. Performance of a flow test through headers and nozzles to assure no blockage.

**F. Plant Halon Systems**

1. The Halon system shall be demonstrated operable:
  - a. At least once per 6 months by verifying each Halon storage tank weight and pressure.
  - b. At least once per 18 months by:
    - (1) Verifying the system, actuates automatically to a simulated test signal.
    - (2) Performance of a flow test through headers and nozzles to assure no blockage.
    - (3) Verifying the operability of the manual initiating system.

### G. Plant Fire Hose Station

1. Each fire hose station shall be verified operable:
  - a. At least once per 31 days by visual inspection of the station to assure all equipment is available,
  - b. At least once per 18 months by removing the hose for inspection and re-racking and replacing all gaskets in the couplings that are degraded.
  - c. At least once per 3 years, partially open each hose station valve to verify valve operability and no blockage, and conduct a hose hydrostatic test at pressure at least 50 psig greater than the maximum pressure available at that hose station.

### H. Plant Fire Barriers Penetration Fire Seals

1. Penetration fire barriers shall be verified to be functional by a visual inspection:
  - a. At least once per 18 months, and
  - b. Prior to declaring a fire penetration seal functional following repairs or maintenance.
2. Penetration fire barriers that perform a pressure sealing function shall be verified to be functional by performance of a local leakage test prior to declaring a penetration fire barrier functional following repairs or maintenance.

### I. Back-Up Fire Pump Diesel Engine

The fire pump diesel engine shall be demonstrated operable:

1. At least once per 31 days by verifying:
  - a. The fuel storage tank contains at least 220 gallons of fuel, and
  - b. The diesel starts from ambient conditions and operates for at least 20 minutes.

2. By use of diesel fuel within the limits specified in Table 1 of ASTM D975-74 for standard #2 fuel oil.
  
3. At least once per 18 months, during shutdown, by:
  - a. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service, and
  - b. Verifying the diesel starts from ambient conditions on the auto-start signal and operates for  $\geq$  20 minutes while loaded with the fire pump.
  
4. The fire pump diesel starting 24-volt battery bank and charger shall be demonstrated operable:
  - a. At least once per 7 days by verifying that:
    1. The electrolyte level of each battery is above the plates, and
    2. The overall battery voltage is  $\geq$  24 volts.
  - b. At least once per 92 days by verifying that the specific gravity is appropriate for continued service of the battery.
  - c. At least once per 18 months by verifying that:
    1. The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, and
    2. The battery-to-battery and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.

2. Retraining and replacement training of station personnel shall be in accordance with American National Standard 18.1 "Selection and Training of Nuclear Power Plant Personnel" dated March 8, 1971 and 10 CFR 55, Appendix A.
3. The following requirements supplement the applicable regulations of 10 CFR 50.54:

<u>Condition</u>	<u>Minimum Complement</u>
1. One unit operating	1 SLO, 2 LO, 2 AO
2. One unit fueled and shutdown **	1 SLO, 1 LO, 1 AO
3. One unit operating and one unit shutdown	1 SLO*, 3 LO, 2 AO
4. Both units fueled and shutdown **	1 SLO, 2 LO, 1 AO
5. Both units operating	2 SLO, 3 LO, 2 AO

## NOTE:

SLO = Senior Licensed Operator as defined by 10 CFR 55.4(e)  
 LO = Licensed Operator as defined by 10 CFR 55.4(d)  
 AO = Auxiliary Operator

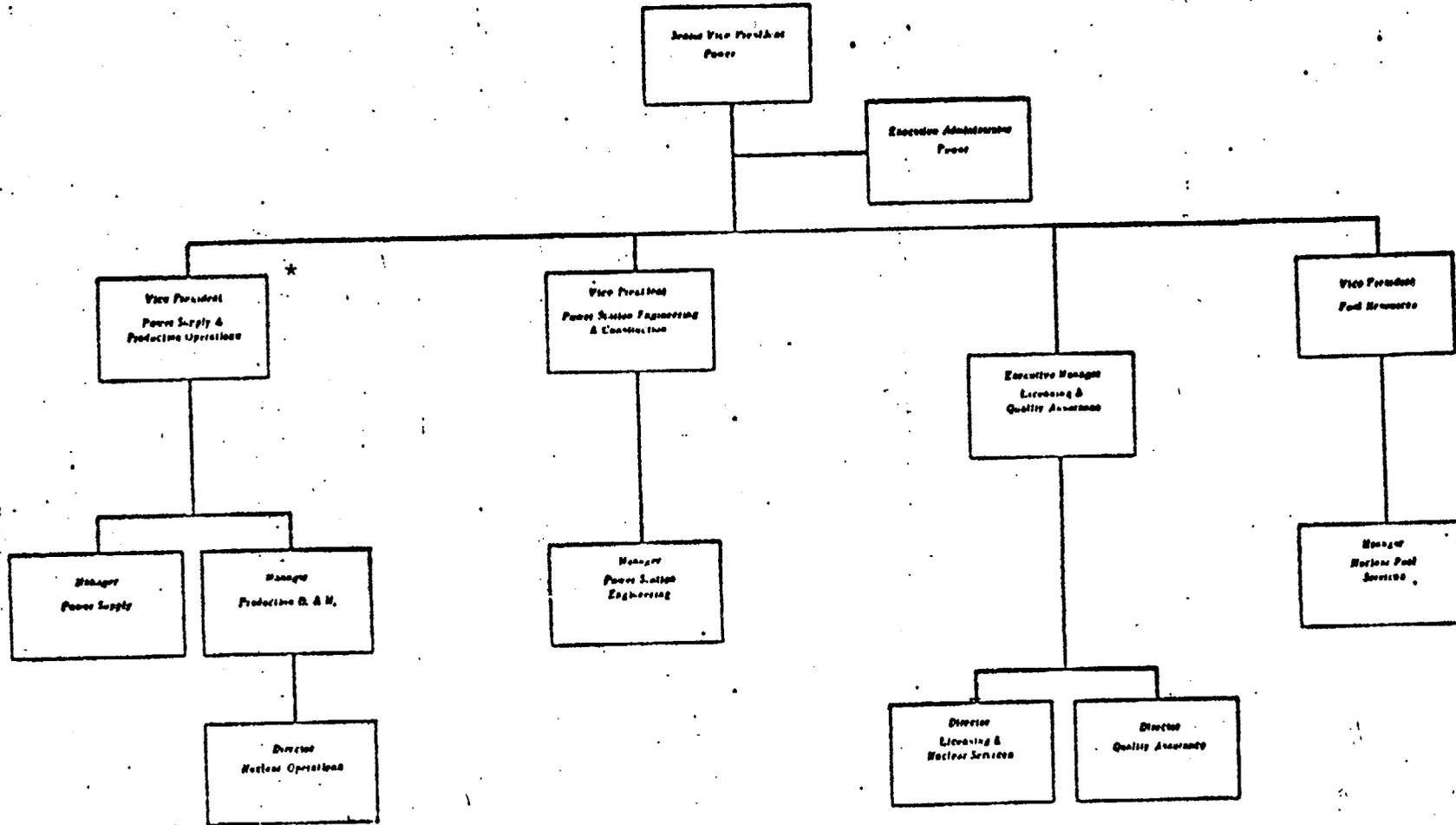
\* When the shutdown unit is undergoing refueling or startup, 1 additional SLO will be added to this shift complement to ensure supervision of these activities.

\*\* A LO for each fueled unit shall be in the control room and a SLO shall be on site. For each SLO in the control room, the requirement to have a LO in the control room shall be waived.

4. A fire team of at least five members, all of whom have received fire service training, will be maintained on-site at all times. This excludes personnel in Section 3 above of the minimum shift crew necessary for safe shutdown of the plant and any personnel required for other essential functions during a fire emergency.

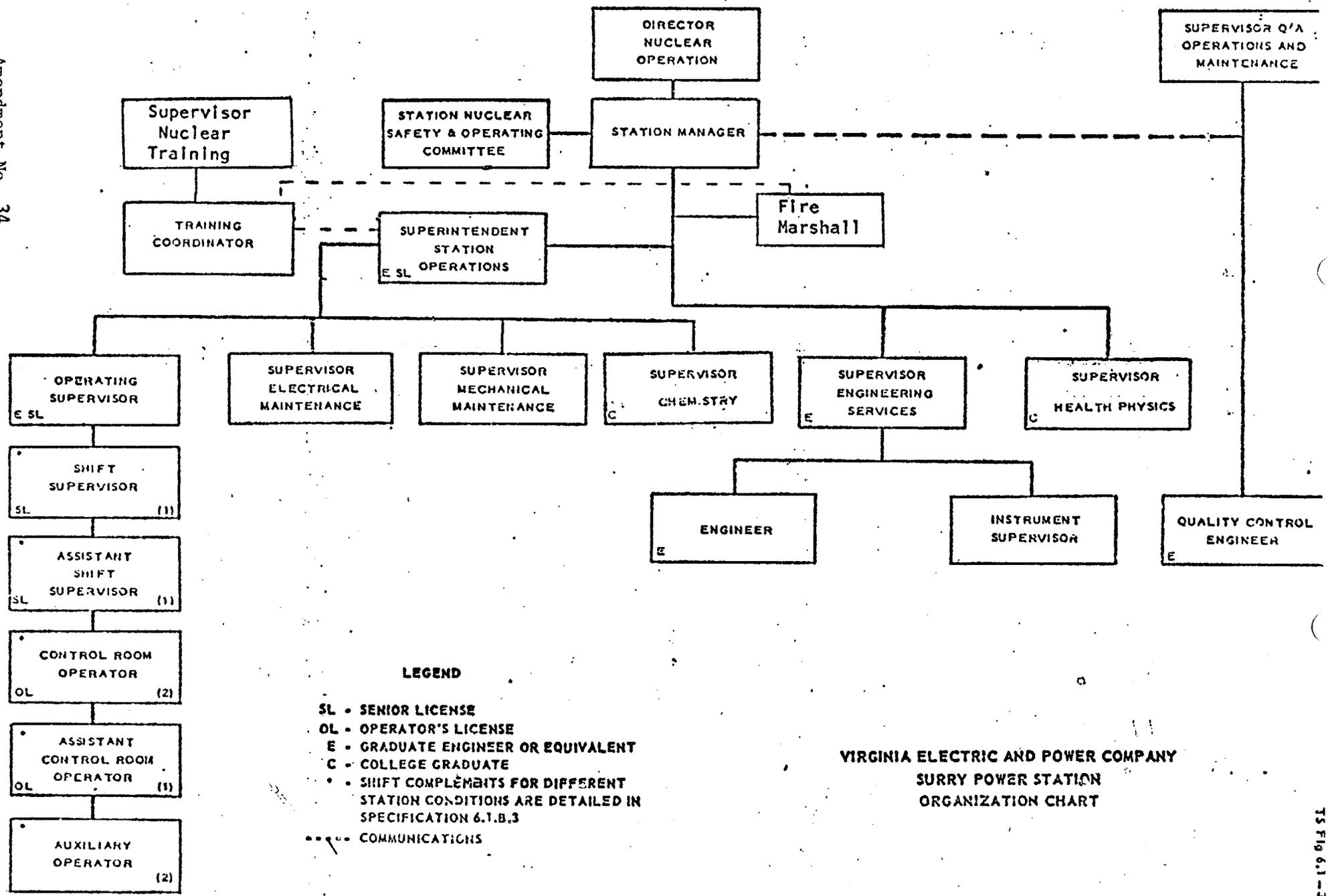
5. A training program for the fire brigade and fire teams shall be maintained under the directions of a Fire Marshall and shall meet or exceed the requirements of the NFPA Code Section 27 (1976).
- C. Organization units to provide a continuing review of the operational and safety aspects of the nuclear facility shall be constituted and have the authority and responsibilities outlined below:
1. Station Nuclear Safety and Operation Committee
    - a. Membership
      - (1) Chairman - Station Manager
      - (2) Vice Chairman - Superintendent - Station Operations

VIRGINIA ELECTRIC AND POWER COMPANY  
ORGANIZATION CHART  
POWER



October 1, 1975

\*Responsible for Corporate Fire Protection Program



**LEGEND**

- SL - SENIOR LICENSE
- OL - OPERATOR'S LICENSE
- E - GRADUATE ENGINEER OR EQUIVALENT
- C - COLLEGE GRADUATE
- - SHIFT COMPLEMENTS FOR DIFFERENT STATION CONDITIONS ARE DETAILED IN SPECIFICATION 6.1.B.3
- COMMUNICATIONS

**VIRGINIA ELECTRIC AND POWER COMPANY  
SURRY POWER STATION  
ORGANIZATION CHART**

(c) Reportable occurrences as defined in the station technical specifications.

Review of events covered under this paragraph shall include the results of any investigations made and the recommendations resulting from such investigations to prevent or reduce the probability of recurrence of the event.

5. Any other matter involving safe operation of the nuclear power stations which a duly appointed subcommittee or committee member deems appropriate for consideration, or which is referred to the SyNSOC by the Station Nuclear Safety and Operating Committee.

1. Audits and Inspections

Audits and inspections of station activities shall be performed under the cognizance of the SyNSOC. These audits and inspections shall encompass:

1. The conformance of facility operation of all provisions contained within the Technical Specifications and applicable license conditions at least once per year.
2. The performance, training and qualifications of the entire facility staff at least once every year.
3. The results of all actions taken to correct deficiencies occurring in facility equipment, structures, systems or

- method of operation that affect nuclear safety at least once every six (6) months.
4. The performance of all activities required by the Quality Assurance Program to meet the criteria of Appendix B, 10 CFR 50, at least once every two (2) years.
  5. The Station Emergency Plan and implementing procedures at least once every two (2) years.
  6. The Station Security Plan and implementing procedures at least once every year.
  7. The facility fire protection program and implementing procedures at least once every 24 months.
  8. An Independent fire protection and loss prevention inspection and audit shall be performed annually utilizing either qualified offsite licensee personnel or an outside fire protection firm.
  9. An inspection and audit of the fire protection and loss prevention program shall be performed by an outside qualified fire consultant at intervals no greater than 3 years.
  10. Any other area of facility operation considered appropriate by the SyNSOC or the Vice President - Power Supply and Production Operations.

j. Authority

The SyNSOC shall report to and advise the Vice President - Power Supply and Production Operations on those areas of responsibility specified in sections 6.1.C.2.h and 6.1.C.2.i.

**k. Records**

Records of SyNSOC activities shall be prepared, maintained and disseminated promptly to:

1. Senior Vice President - Power
2. Vice President - Power Supply and Production Operations
3. Nuclear Power Station Managers
4. Director Nuclear Operations
5. Members of the SyNSOC
6. Others that the Chairman of the SyNSOC may designate.

**l. Procedures**

Written bylaws and administrative procedures for committee operation shall be maintained describing the methods of submission and the content of presentations to the committee; provisions for use of subcommittee evaluations and recommendations; distribution of minutes, and, such other matters as may be appropriate.

- H. Practice of site evacuation exercises shall be conducted annually, following emergency procedures and including a check of communications with off-site report groups. An annual review of the Emergency Plan will be performed.
- I. The industrial security program which has been established for the station shall be implemented, and appropriate investigation and/or corrective action shall be taken if the provisions of the program are violated. An annual review of the program shall be performed.
- J. The facility fire protection program and implementing procedures which have been established for the station shall be implemented. The program shall be reviewed at least once every two years.

analysis and interpretation of the test data, the least squares fit analysis of the test data, the instrument error analysis, and the structural conditions of the containment or components, if any, which contributed to the failure in meeting the acceptance criteria. Results and analyses of the supplemental verification test employed to demonstrate the validity of the leakage rate test measurements shall also be included."

- f. Initial Containment Structural Test. A special summary technical report shall be submitted to the Director, Division of Operating Reactors, USNRC, Washington, D.C. 20555, within 3 months after completion of the test. This report will include a summary of the measurements of deflections, strains, crack width, crack patterns observed, as well as comparisons with predicted values of acceptance criteria.

#### 4. Special Reports

- a. With the number of fire detection instruments operable less than specified in Table 3.21-1 for more than 14 days, submit a Special Report to the Commission within the next 10 days outlining the cause of the malfunction and the plans for restoring the instrument(s) to operable status.
- b. With less than the fire suppression water system equipment required in specification 3.21 for more than 7 days, submit a Special Report to the Commission within the next 10 days, outlining the plans and procedures to be used to provide for the loss of redundancy in the system.

- c. With no fire suppression water system operable, within 24 hours; notify the Commission outlining the action taken and the plans and schedule for restoring the system to operable status.
- d. With redundant fire suppression water system component inoperable for more than 14 days, submit a Special Report to the Commission within the next 10 days outlining the cause of inoperability and the plans for restoring the component to operable status.
- e. With the CO<sub>2</sub> fire protection system inoperable for more than 14 days, submit a Special Report to the Commission within the next 10 days outlining the cause of inoperability and the plans for restoring the system to operable status.
- f. With the Records Vault halon fire protection system inoperable for more than 14 days, submit a Special Report to the Commission within the next 10 days outlining the cause of inoperability and the plans for restoring the system to operable status.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

VIRGINIA ELECTRIC & POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 33  
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric & Power Company (the licensee) dated December 31, 1976, as revised August 1, 1977, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

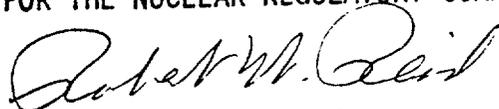
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-37 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 33, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment becomes effective 30 days after the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert W. Reid, Chief  
Operating Reactors Branch #4  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: November 30, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 33

FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NO. 50-281

Revise Appendix A as follows:

Remove Pages

1.0-7

-

-

6.1-2

Figure 6.1-1

Figure 6.1-3

6.1-10 thru 6.1-12

6.4-7c

6.6-16

Insert Pages

1.0-7

3.21-1 thru 3.21-8

4.18-1 thru 4.18-5

6.1-2a

6.1-2b

Figure 6.1-1

Figure 6.1-3

6.1-10 thru 6.1-12

6.4-7c

6.6-16

6.6-17

Changes on the revised pages are shown by marginal lines.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENTS NOS. 34 AND 33 TO FACILITY OPERATING LICENSES NOS. DPR-32 AND DPR-37

VIRGINIA ELECTRIC & POWER COMPANY

SURRY POWER STATION UNITS NOS. 1 AND 2

DOCKETS NOS. 50-280 AND 50-281

INTRODUCTION

Following a fire at the Browns Ferry Nuclear Station in March 1975, we initiated an evaluation of the need for improving the fire protection programs at all licensed nuclear power plants. As part of this continuing evaluation, in February 1976 we published a report entitled "Recommendations Related to Browns Ferry Fire", NUREG-0050. This report recommended that improvements in the areas of fire prevention and fire control be made in most existing facilities and that consideration be given to design features that would increase the ability of nuclear facilities to withstand fires without the loss of important functions. To implement the report's recommendations, the NRC initiated a program for reevaluation of the fire protection programs at all licensed nuclear power stations and for a comprehensive review of all new license applications.

We have issued new guidelines for fire protection programs in nuclear power plants. These guidelines reflect the recommendations in NUREG-0050. These guidelines are contained in the following documents:

"Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," NUREG-75/087, Section 9.5.1, "Fire Protection," May 1976, which includes "Guidelines for Fire Protection for Nuclear Power Plants," (BTP APCS 9.5-1), May 1, 1976.

"Guidelines for Fire Protection for Nuclear Power Plants" (Appendix A to BTP APCS 9.5-1), August 23, 1976.

"Supplementary Guidance on Information Needed for Fire Protection Program Evaluation," September 30, 1976.

"Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," June 14, 1977.

The Virginia Electric and Power Company (the licensee) has submitted a description of the fire protection program for the Surry Power Station Units Nos. 1 and 2, by letter dated April 5, 1977. This program is under detailed review by the NRC. In the interim, until we complete our detailed review, we have concluded that it is appropriate to amend the facility licenses by incorporating into the Technical Specifications operability and surveillance requirements for the existing fire protection equipment and systems. In addition, the amendments would include administrative requirements for the implementation of the fire protection program.

By letter dated September 30, 1976, we requested the licensee to submit Technical Specifications for the presently-installed fire protection equipment at this facility. The licensee responded by letter of December 31, 1976. By letter of June 16, 1977, we issued sample Technical Specifications and reiterated that these specifications were for existing systems only.

Subsequently, the licensee proposed Technical Specifications by letter dated August 1, 1977. Based on our review and consideration of that response and the responses of other licensees, we modified certain action statements and surveillance frequencies in order to provide more appropriate and consistent specifications which we subsequently discussed with the licensee. The licensee has agreed to all modifications. However, it will be necessary to provide a period of time to modify procedures to conform with the details of the modifications to the Technical Specifications and to provide time to complete the required personnel training where necessary, therefore the amendments would become effective 30 days after the date of issue.

#### DISCUSSION AND EVALUATION

The guidelines for Technical Specifications that we developed and sent to all licensees are based on assuring that the fire protection equipment currently installed for the protection of safety related areas of the plant is operable. This assurance is obtained by requiring periodic surveillance of the equipment and by requiring certain corrective actions to be taken if the limiting conditions for operation cannot be met. These guidelines also include administrative features for the overall fire protection program such as interim fire brigade requirements, training, procedures, management review and periodic independent fire protection and loss prevention program inspections.

The equipment and components existing at this facility and included in the scope of these Technical Specification requirements are fire detectors, the fire suppression systems, the hose stations, and penetration fire barriers for piping and cabling penetrations. Operability of the fire detection instrumentation provides warning capability for the prompt detection of fires, to reduce the potential for damage to safety related equipment by allowing rapid response of fire suppression systems.

In the event that the minimum coverage of fire detectors cannot be met, hourly fire patrols are required in the affected area until the inoperable instrumentation is restored to operability. The operability of the fire suppression systems provides capability to confine and extinguish fires. In the event that portions of the fire suppression systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is returned to service. In the event that the fire suppression water system becomes inoperable, a backup fire protection water system is required within 24 hours and a report to the NRC is required within 24 hours to provide for prompt evaluation of the acceptability of the corrective measures for adequate fire suppression capability. The functional integrity of the penetration fire barriers provides protection to confine or retard fires from spreading to adjacent portions of the facility. During periods of time when a fire barrier is not functional, a continuous fire watch is required to be maintained in the vicinity of the affected barrier to provide fire prevention methods and prompt detection and suppression in the event of a fire.

We have reviewed the licensee's proposed interim Technical Specifications against our requirements as implemented in the sample Technical Specifications. We have made some modifications to the Specifications that were proposed by the licensee in order to make them conform to our requirements. One of the proposed specifications that we changed involves the minimum size of the on-site fire brigade. In our previous sample Technical Specifications we did not identify the number of members on a fire brigade that we would find acceptable. We have now concluded that minimum number for a typical commercial nuclear power plant to be five (5). The basis for this conclusion is presented in an attachment to this SER entitled "Staff Position Minimum Fire Brigade Shift Size."

In the report of the Special Review Group on the Browns Ferry Fire (NUPEG-0050) dated February 1976, consideration of the safety of operation of all operating nuclear power plants pending the completion of our detailed fire protection evaluation was presented. The following quotations from the report summarize the basis for our conclusion that the operation of the plants, until we complete our review, does not present an undue risk to the health and safety of the public.

"A probability assessment of public safety or risk in quantitative terms is given in the Reactor Safety Study (WASH-1400). As the result of the calculation based on the Browns Ferry fire, the study concludes that the potential for a significant release of radioactivity from such a fire is about 20% of that calculated from all other causes analyzed. This indicates that predicted potential accident risks from all causes were not greatly affected by consideration of the Browns Ferry fire. This is one of the reasons that urgent action in regard to reducing risks due to potential fires is not required. The study (WASH-1400) also points out that 'rather straight-forward measures, such as may already exist at other nuclear plants, can significantly reduce the likelihood of a potential core melt accident that might result from a large fire.' The Review Group agrees.

"Fires occur rather frequently; however, fires involving equipment unavailability comparable to the Browns Ferry fire are quite infrequent (see Section 3.3 [of NUREG-0050]). The Review Group believes that steps already taken since March 1975 (see Section 3.3.2) have reduced this frequency significantly.

"Based on its review of the events transpiring before, during and after the Browns Ferry fire, the Review Group concludes that the probability of disruptive fires of the magnitude of the Browns Ferry event is small, and that there is no need to restrict operation of nuclear power plants for public safety. However, it is clear that much can and should be done to reduce even further the likelihood of disabling fires and to improve assurance of rapid extinguishment of fires that occur. Consideration should be given also to features that would increase further the ability of nuclear facilities to withstand large fires without loss of important functions should such fires occur."

Subsequent to the Browns Ferry fire and prior to the Special Review Group's investigation, the Office of Inspection and Enforcement took steps with regard to fire protection. Special bulletins were sent to all licensees of operating power reactors on March 24, 1975, and

April 3, 1975, directing the imposition of certain controls over fire ignition sources, a review of procedures for controlling maintenance and modifications that might affect fire safety, a review of emergency procedures for alternate shutdown and cooling methods, and a review of flammability of materials used in floor and wall penetration seals. Special inspections covering the installation of fire stops in electrical cables and in penetration seals were completed at all operating power reactors in April and May 1975. Inspection findings which reflected non-compliance with NRC requirements resulted in requiring corrective action by licensees. Follow-up inspections have confirmed that licensees are taking the required corrective actions and that administrative control procedures are in place.

Since these inspection activities and the subsequent Special Review Group recommendations in the 1975 to 1976 time period, there has been no new information to alter the conclusions of the Special Review Group, and the ongoing fire protection program flowing from those conclusions is still adequate.

Therefore, we have found these specifications acceptable on an interim basis until such time that our overall review is complete, required equipment is installed and operable, and final specifications have been developed and issued.

#### ENVIRONMENTAL CONSIDERATION

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

#### CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: November 30, 1977

## Staff Position

### Minimum Fire Brigade Shift Size

#### INTRODUCTION

Nuclear power plants depend on the response of an onsite fire brigade for defense against the effects of fire on plant safe shutdown capabilities. In some areas, actions by the fire brigade are the only means of fire suppression. In other areas, that are protected by correctly designed automatic detection and suppression systems, manual fire fighting efforts are used to extinguish: (1) fires too small to actuate the automatic system; (2) well developed fires if the automatic system fails to function; and (3) fires that are not completely controlled by the automatic system. Thus, an adequate fire brigade is essential to fulfill the defense in depth requirements which protect safe shutdown systems from the effects of fires and their related combustion by-products.

#### DISCUSSION

There are a number of factors that should be considered in establishing the minimum fire brigade shift size. They include:

- 1) plant geometry and size;
- 2) quantity and quality of detection and suppression systems;
- 3) fire fighting strategies for postulated fires;
- 4) fire brigade training;
- 5) fire brigade equipment; and
- 6) fire brigade supplements by plant personnel and local fire department(s).

In all plants, the majority of postulated fires are in enclosed windowless structures. In such areas, the working environment of the brigade created by the heat and smoke buildup within the enclosure, will require the use of self-contained breathing apparatus, smoke ventilation equipment, and a personnel replacement capability.

Certain functions must be performed for all fires, i.e., command brigade actions, inform plant management, fire suppression, ventilation control, provide extra equipment, and account for possible injuries. Until a site specific review can be completed, an interim minimum fire brigade size of five persons has been established. This brigade size should provide a minimum working number of personnel to deal with those postulated fires in a typical presently operating commercial nuclear power station.

If the brigade is composed of a smaller number of personnel, the fire attack may be stopped whenever new equipment is needed or a person is injured or fatigued. We note that in the career fire service, the minimum engine company manning considered to be effective for an initial attack on a fire is also five, including one officer and four team members.

It is assumed for the purposes of this position that brigade training and equipment is adequate and that a backup capability of trained individuals exist whether through plant personnel call back or from the local fire department.

### POSITION

1. The minimum fire brigade shift size should be justified by an analysis of the plant specific factors stated above for the plant, after modifications are complete.
2. In the interim, the minimum fire brigade shift size shall be five persons. These persons shall be fully qualified to perform their assigned responsibility, and shall include:

One Supervisor - This individual must have fire tactics training. He will assume all command responsibilities for fighting the fire. During plant emergencies, the brigade supervisor should not have other responsibilities that would detract from his full attention being devoted to the fire. This supervisor should not be actively engaged in the fighting of the fire. His total function should be to survey the fire area, command the brigade, and keep the upper levels of plant management informed.

Two Hose Men - A 1.5 inch fire hose being handled within a window-less enclosure would require two trained individuals. The two team members are required to physically handle the active hose line and to protect each other while in the adverse environment of the fire.

Two Additional Team Members - One of these individuals would be required to supply filled air cylinders to the fire fighting members of the brigade and the second to establish smoke ventilation and aid in filling the air cylinder. These two individuals would also act as the first backup to the engaged team.

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKETS NOS. 50-280 AND 50-281VIRGINIA ELECTRIC AND POWER COMPANYNOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY  
OPERATING LICENSES

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendments Nos. 34 and 33 to Facility Operating Licenses Nos. DPR-32 and DPR-37, issued to Virginia Electric and Power Company (the licensee), which revised Technical Specifications for operation of the Surry Power Stations, Units Nos. 1 and 2 (the facilities) located in Surry County, Virginia. The amendments become effective 30 days after the date of issuance.

The amendments incorporate fire protection Technical Specifications on the existing fire protection equipment and add administrative controls related to fire protection at the facilities. This action is being taken pending completion of the Commission's overall fire protection review of the facilities.

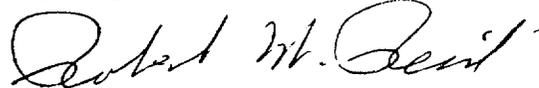
The application for the amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the application for amendments dated December 31, 1976, as revised August 1, 1977, (2) Amendments Nos. 34 and 33 to Licenses Nos. DPR-32 and DPR-37, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Swem Library, College of William and Mary, Williamsburg, Virginia. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 30th day of November 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert W. Reid, Chief,  
Operating Reactors Branch #4  
Division of Operating Reactors