

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

October 29, 1980

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
Attn: Mr. Steven A. Varga, Chief  
Operating Reactors Branch No. 1  
Division of Reactor Licensing  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Serial No. 869  
NO/SWB:jmj  
Docket Nos: 50-280  
50-281  
License Nos: DPR-32  
DPR-37

Dear Mr. Denton:

SURRY POWER STATION  
FIRE PROTECTION MODIFICATIONS

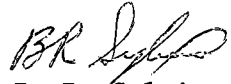
The Fire Protection Safety Evaluation Report of Surry Power Station dated September 19, 1979 required implementation of fire protection modifications. Thirty three of these modifications are required to be completed by October 31, 1980. Four of these modifications are associated with Unit 1 and will be completed prior to startup after the Steam Generator Replacement outage. The purpose of this letter is to report the general status of all fire protection items and specify in detail the status of the modifications required to be completed by October 31, 1980.

Attachment I details the status of modifications required to be completed October 31, 1980. Attachment II is a Project Status Summary of all fire protection modifications. Included by Attachment III is design information on the fire modifications.

We will submit on October 31, 1980 a report which will document completion of modifications listed in Attachment I and transmit all information as indicated by Attachment I.

If you have any questions or comments, please contact us.

Very truly yours,

  
B. R. Sylvia  
Manager - Nuclear  
Operations and Maintenance

Attachments

cc: Mr. James P. O'Reilly, Director  
Office of Inspection and Enforcement  
Region II

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A006  
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### 3.1.29 WATER SPRAY SHIELDS

#### DESCRIPTION

The component cooling water pump spray shields will be composed of deflection shields located to prevent direct water spray to the motor air intake and exhaust. Presently, the component cooling water pump motors are of the drip-proof type; therefore, shields installed to preclude moisture penetration to motor air intake and exhaust will meet the requirements of the FPSEER. The spray shields will prevent general area fire protection from disabling all four pump motors at one time.

The shields will have a minimal effect upon air flow to and from the pump motors. The shields will be mounted to the floor by anchor bolts for easy removal and will be designed to withstand an earthquake of the same magnitude as was designed for the component cooling water pump motors.

MODIFICATIONS WITH COMPLETION DUE  
DATE OF OCTOBER 31, 1980

A. Completed Modifications

- 3.1.1 Administrative Controls
- 3.1.2 Air Flow Detectors
- 3.1.3 Breathing Apparatus
- 3.1.6 Combustibles
- 3.1.7 Charcoal Filters
- 3.1.8 Emergency Lighting
- 3.1.11 Fire Doors
- 3.1.13 Fire Extinguishers
- 3.1.14 Fire Sadder
- 3.1.15(1)(2),(3) Floor Drains, Dikes
- 3.1.17 Hose Nozzles
- 3.1.19 Hydrogen Lines
- 3.1.20 Hose Foam Carts
- 3.1.21 Hydrants
- 3.1.22 Valve Supervision
- 3.1.26(2) Heat Collector Plates

B. Modifications In Progress and Anticipated Status As of 10/31/80

- 3.1.4 Cable Tray Covers  
Expected to be completed by 10/31/80.
- 3.1.5 Safe Shutdown Circuitry - Unit 1  
Design is being developed. Unit 1 modification will be completed prior to startup after steam generator replacement.
- 3.1.10 Fire Barriers  
Expected to be completed by 10/31/80.

3.1.12 Fire Dampers

A total of 31 fire dampers are being installed. All dampers are expected to be complete 10/31/80. However, fire dampers which were ordered in May 1980 had to be sent back to the factory for rework. The dampers are expected to be onsite and installed before October 31, 1980, however, late delivery could delay completion.

3.1.15(4) Reactor Coolant Pump Motor Oil Collection System - Unit 1

Construction of the enclosures are in progress. Unit 1 collection system will be installed prior to startup after steam generator replacement outage.

3.1.16(1)(2) Gas Suppression Systems

Since the NRC review, Surry Power Station has experienced problems with the pneumatic controls on the high pressure CO2 system due to moisture intrusion and leaks. The high pressure CO2 initiation system is now being changed to an electrical system. The new system will be operational by December 31, 1980. However, lockout annunciation in the control room required by the SER is incorporated in the smoke detection modification (3.1.9) and will be operational by startup following the steam generator replacement outage. The new system fulfills all the concerns of the NRC staff. A description of the system is included in Attachment III. The new system is expected to be completed by December 31, 1980.

3.1.16(3) Additional CO2 Nozzles. Expected to be completed by 10/31/80.

3.1.18 Hose Stations

All modifications required by this item are expected to be functional by 10/31/80 with the exception of 3.1.18(5) (Containment Dry Standpipe Unit 1) which will be complete prior to startup Unit 1 after steam generator replacement outage.

3.1.23 Monitoring Panels - Unit 1

Design is being developed. Unit 1 modification will be complete by Unit 1 startup after steam generator replacement outage.

3.1.24 Penetration

Penetration sealing is expected to be completed by 10-31-80.

### 3.1.25 Charging Pump Cross-Connect

If a fire occurs in the cable vault and tunnel, motor control center room area, it is possible that cables providing power and control to the charging pumps for one unit may be affected.

To nullify the effects of cable loss for the charging pumps, the Units 1 & 2 charging pump discharge lines will be cross-connected. The cross-connect would allow the charging pumps from the "unaffected" unit to supply borated water for both units to allow them to reach a cold shutdown condition. Power, instrument, and control associated with the charging pumps would be from the unaffected unit's power sources and routed completely outside the cable vault and tunnel of the affected unit.

As shown on the attached sketch, the cross-connect would be provided with two manual, normally locked closed isolation valves. Between the valves would be normally closed drain valves and a pressure switch with annunciation to indicate a pressure buildup within this space between the valves. The isolation valves would be opened only in the event of incapacitation of all of one unit's charging pumps due to a postulated fire. All valves and piping will be designed to Category I, Q2 requirements.

The intended operation of this system would be to use one or more of the pumps from the plant unaffected by a fire to supply borated water as needed to the affected plant to allow a cold shutdown. Manual control of boration and of the pumps would be used. Shutdown of the unaffected plant would also be performed. Component cooling water is available to both units. The reactor coolant pumps for the affected unit would be inoperable due to the fire.

This modification should be reviewed by Westinghouse for general concept and any comments it may have in regard to recommended flow paths (let-down and charging); requirements for seal water flow and suggested method of control or operation of the system.

3.1.26(1) Auxiliary Building Ventilation System New Filters

The auxiliary building ventilation system is presently being modified and is scheduled to be completed before startup after the steam generator replacement outage. The automatic sprinkler system will be in service when the new filter banks are operational.

3.1.26(3) Cable Vault and Tunnel Sprinkler System

The system is expected to be functional by 10/31/80.

3.1.28 Fire Detection System Power Supply

The modification is expected to be completed by 10/31/80.

3.1.29 Water Spray Shields

The modification is expected to be complete by 10/31/80.

3.1.30(1) Charging Pump Technical Specification

The charging pump cross connect will be operational after completion of the steam generator outage. The technical specification change addressing the charging pump cross connect will be submitted prior to the modification becoming operational.

3.2.1 Safe Shutdown Evaluation

3.2.2

3.2.3

3.2.4

The safe shutdown evaluation and verifications will be submitted on October 31, 1980.

### 3.1.26(3) CABLE VAULT AND TUNNEL SPRINKLER SYSTEM

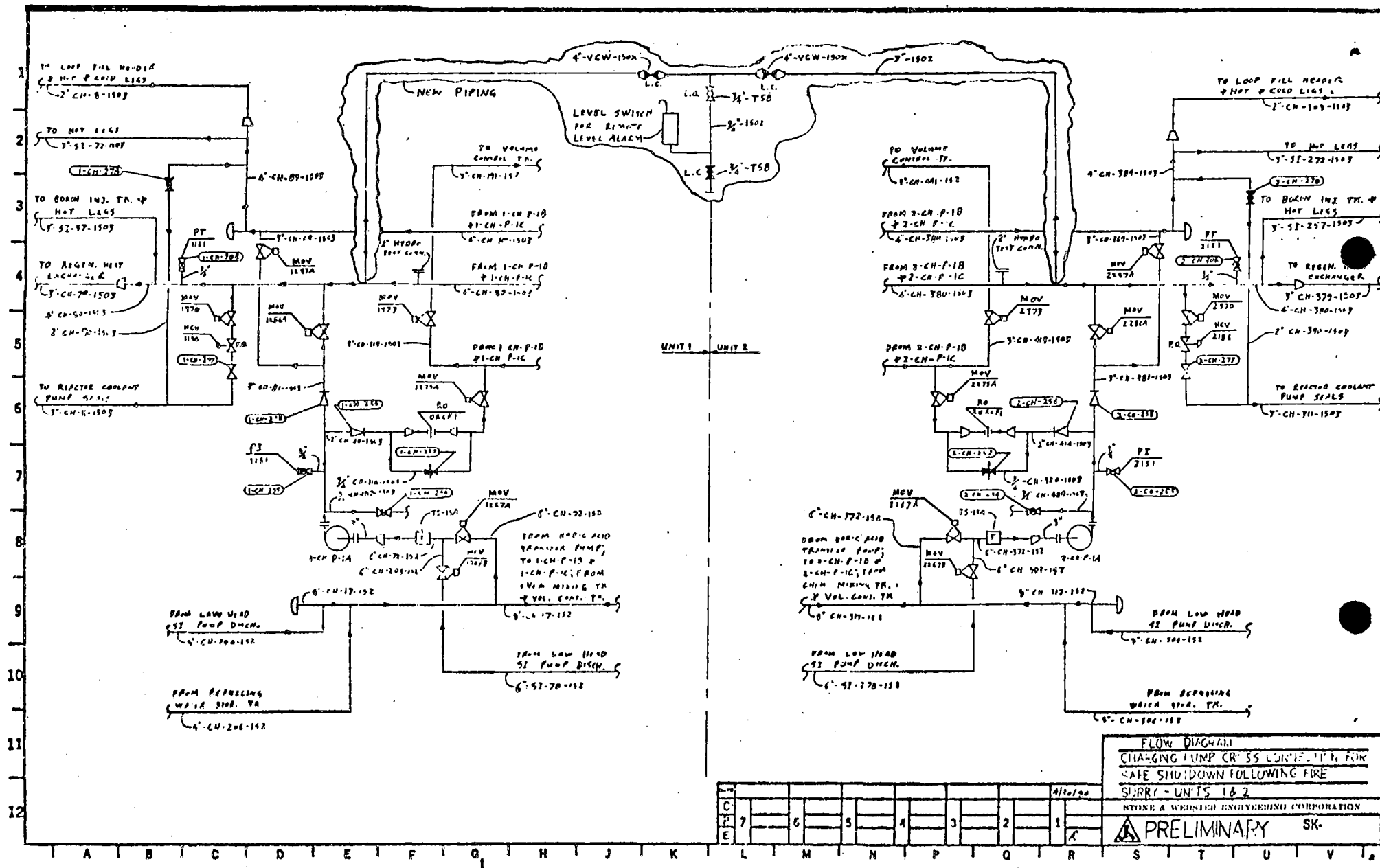
#### DESCRIPTION

The Surry Power Station cable vault and cable tunnel areas contain a large number of safety related cables, including control and power cables for equipment required for safe shutdown. An unmitigated fire in these areas could affect the station's safe shutdown capability. The NRC issued Fire Protection Safety Evaluation Report has identified the need to incorporate the following modifications to these areas:

- a. A manually actuated sprinkler system to be installed in the ceiling of the service building cable vault and cable tunnel. The sprinkler system in the vault will be an open head, dry pipe system, and the sprinkler system in the cable tunnel will be a closed head system located over the aisleway of the tunnel.
- b. A dry standpipe hose station to be installed in each service building cable vault. These hose stations will be provided with low capacity, variable gallonage fog nozzles with ball valve shutoff.

The fire protection sprinkler and hose rack systems for the cable vaults and tunnels will be supplied from the 4 in fire protection supply header on the 27 ft-6 in elevation of the auxiliary building. Water will flow from the existing 4 in supply header through a 4 in tee connection to an isolation valve. From the 4 in isolation valve, a 4 in pipe will be run along the 27 ft-6 in elevation of the auxiliary building and up to the 32 ft-6 in level where it will tie into the 2 1/2 in sprinkler and hose rack distribution manifold. Flow detectors will be installed downstream of each 2 1/2 in distribution valve to provide indication of system operation, or isolation valve leak-by, to the normally dry sections of pipe.

The fire protection sprinkler and hose rack systems for the cable vault and tunnels will have a redundant source of water provided by the fire protection piping which cross-connects the turbine building with the auxiliary building.



FLOW DIAGRAM  
 CHARGING LUMP CR SS CONTAINING  
 SAFE SHUTDOWN FOLLOWING FIRE

SHR - UNITS 1 & 2

RTINE & WESTERN ENGINEERING CORPORATION

PRELIMINARY SK

7	6	5	4	3	2	1	Alt 100



### 3.1.16 GAS SUPPRESSION SYSTEMS

The Surry Power Station cable vaults and cable tunnels contain a large number of safety-related cables, including control and power cables required for safe shutdown. An unmitigated fire in these areas could affect the Station's safe shutdown capability. The NRC issued Fire Protection Safety Evaluation Report has identified the need to incorporate the following modification to those areas:

"Additional nozzles will be provided for the Automatic Total Flooding Carbon Dioxide Fire Suppression System in the outside containment cable penetration vaults and the Service Building cable vaults and tunnels. The additional nozzles will be located in the highest elevations of these spaces to assure more effective coverage of all of the cables."

The modification shall be accomplished by adding a branch header in the "High Bay" area of the Service Building cable vaults at elevation 43 ft. An additional branch will be added in the outside containment cable penetration vault in the area extending under the motor control center. The discharge nozzles in the existing system will be replaced with 2 and 4 port radial discharge nozzles to direct the CO<sub>2</sub> discharge horizontally rather than downward. The Volume of CO<sub>2</sub> being discharged will not be increased but redistributed for a more effective dispersal pattern.

### HIGH PRESSURE CO2 SYSTEMS MODIFICATION

1. Replace pneumatic controls with appropriate electric controls as follows:

1. Fixed temperature rate of rise compensated detectors (190°F) shall be used in lieu of existing NAD's. (2 in each of 3 hazards)
2. An electrical manual pull station shall be mounted at the top of the stairs to each hazard (1 in each of 3 hazards) and at the cylinder banks (1 for each of 3 hazards).
3. Automatic, manual electric, or manual mechanical actuation of a system shall:
  - a. Sound a pre-discharge alarm.
  - b. Initiate a variable time delay of 3 seconds to 3 minutes.
  - c. Discharge system after delay completed.
  - d. Provide discharge alarm at entrance to hazard
  - e. Provide audio-visual alarm at cylinder bank.
  - f. Provide contacts for remote annunciation of actuation.

3.1.26(1) Auxiliary Building Ventilation System New Filters

The auxiliary building ventilation system is presently being modified and is scheduled to be completed before startup after the steam generator replacement outage. The automatic sprinkler system will be in service when the new filter banks are operational.

3.1.26(3) Cable Vault and Tunnel Sprinkler System

The system is expected to be functional by 10/31/80.

3.1.28 Fire Detection System Power Supply

The modification is expected to be completed by 10/31/80.

3.1.29 Water Spray Shields

The modification is expected to be complete by 10/31/80.

3.1.30(1) Charging Pump Technical Specification

The charging pump cross connect will be operational after completion of the steam generator outage. The technical specification change addressing the charging pump cross connect will be submitted prior to the modification becoming operational.

3.2.1 Safe Shutdown Evaluation

3.2.2

3.2.3

3.2.4

The safe shutdown evaluation and verifications will be submitted on October 31, 1980.

### SURRY POWER STATION FIRE PROTECTION MODIFICATIONS PROJECT STATUS SUMMARY

Modifications		MODIFICATIONS SCHEDULE AND STATUS																							
Item No.	Descriptions	9/79	10/79	11/79	12/79	01/80	02/80	03/80	04/80	05/80	06/80	07/80	08/80	9/80	10/80	11/80	12/81	1/81	2/81	3/81	4/81	5/81			
3.1.1	Administrative Controls	[Hatched bar from 9/79 to 12/79]																							
3.1.2	Air Flow Detectors	[Hatched bar from 10/79 to 12/79]																							
3.1.3	Breathing Apparatus	[Hatched bar from 10/79 to 12/79]																							
3.1.4	Cable Tray Covers	[Hatched bar from 10/79 to 06/80]																							
3.1.5	Safe Shutdown Circuitry	[Hatched bar from 03/80 to 09/80]																							
3.1.6	Combustibles	[Hatched bar from 9/79 to 10/79]																							
3.1.7	Charcoal Filters	[Hatched bar from 10/79 to 03/80]																							
3.1.8	Emergency Lighting	[Hatched bar from 10/79 to 04/80]																							
3.1.9	Fire Detection Systems	[Hatched bar from 03/80 to 09/80]																							
3.1.10	Fire Barriers	[Hatched bar from 02/80 to 09/80]																							
3.1.11	Fire Doors	[Hatched bar from 9/79 to 06/80]																							
3.1.12	Fire Dampers	[Hatched bar from 10/79 to 06/80]																							
3.1.13	Fire Extinguishers	[Hatched bar from 9/79 to 01/80]																							
3.1.14	Fire Ladder	[Hatched bar from 9/79 to 10/79]																							
3.1.15A	Floor Drains, Dikes	[Hatched bar from 9/79 to 02/80]																							
3.1.15B	Oil Collection Systems	[Hatched bar from 9/79 to 09/80]																							
3.1.16	Gas Suppression Systems	[Hatched bar from 10/79 to 10/80]																							
3.1.17	Hose Nozzles	[Hatched bar from 9/79 to 12/79]																							
3.1.18	Hose Stations	[Hatched bar from 10/79 to 07/80]																							
3.1.19	Hydrogen Lines	[Hatched bar from 10/79 to 04/80]																							
3.1.20	Hose Foam Carts	[Hatched bar from 9/79 to 04/80]																							
3.1.21	Hydrants	[Hatched bar from 9/79 to 10/79]																							
3.1.22	Valve Supervision	[Hatched bar from 10/79 to 12/79]																							
3.1.23	Monitoring Panels	[Hatched bar from 12/79 to 08/80]																							
3.1.24	Penetrations	[Hatched bar from 9/79 to 08/80]																							
3.1.25	Safe Shutdown	[Hatched bar from 10/79 to 09/80]																							
3.1.26	Water Suppression Systems	[Hatched bar from 02/80 to 10/80]																							
3.1.27	Ventilation System	[Hatched bar from 9/79 to 09/80]																							
3.1.28	Fire Detection System Power	[Hatched bar from 11/79 to 08/80]																							
3.1.29	Water Spray Shields	[Hatched bar from 12/79 to 07/80]																							
3.1.30	Technical Specifications	[Hatched bar from 12/79 to 01/80]																							
3.2.1	Auxiliary Boiler Room	[Hatched bar from 03/80 to 04/80]																							
3.2.2	Fire Dampers	[Hatched bar from 03/80 to 06/80]																							
3.2.3	Safe Shutdown	[Hatched bar from 01/80 to 04/80]																							
3.2.4	Charcoal Filter Hazard	[Hatched bar from 03/80 to 04/80]																							
3.2.5	In-Situ Testing	[Hatched bar from 03/80 to 04/80]																							

**KEY**

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|---|--|
| <ol style="list-style-type: none"> <li>1. Beginning of bar represents project start date.</li> <li>2. End of bar represents project target completion date.</li> <li>3. Shaded portion represents percent complete.</li> <li>4. Absence of block indicates project has not been started.</li> </ol> | <ol style="list-style-type: none"> <li>5. Asterisk * indicates the date of complete submittal of required information.</li> <li>6. Delta Δ indicates the date of partial submittal of required information.</li> </ol> |
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ISSUE DATE: 10-24-80

3.1.4 AND 3.1.10 - CABLE TRAY COVERS AND FIRE BARRIERSDESCRIPTION

Safety related cable trays at the Surry Power Station are provided with covers and fire barriers to prevent the initiation and spread of fires that could damage the safety related cables. The "Fire Protection Safety Evaluation Report" dated September 19, 1979, issued by the NRC, has determined the need to install solid metal tray covers and barriers on safety related cable trays, as indicated below, where the existing physical separation does not meet the minimum distances stipulated in the Regulatory Guide 1.75 guidelines.

Field Survey

A field survey was conducted at the Surry Power Station to identify cable tray sections that require covers and/or barriers. Fire barrier details were developed to comply with the requirements of the NRC Safety Evaluation Report. The raised-vented configuration of the existing tray covers was determined to be in compliance with the solid cover requirements of the above mentioned report. The results of the field survey are as follows:

Area No.	Unit No.	Description	Comply with NRC Safety Evaluation Report Requirements?	Modification
1	1	Containment Electrical Penetration and Cable Vault	Yes	none
2	1	Service Building Cable Vault & Tunnel	Yes	None
3	2	Service Building Cable Vault & Tunnel	Yes	None
4	2	Containment Electrical Penetration and Cable Vault	Yes	None
5	1	Relay Room	Yes	None
6	1	Emergency Switchgear Room 1H	Yes	None
7	1	Emergency Switchgear Room 1J	Yes	None
8	2	Relay Room	(Note 1)	(Note 2)
9	2	Emergency Switchgear Room 2H	(Note 1)	(Note 2)
10	2	Emergency Switchgear Room 2J	Yes	None
11	1&2	Auxiliary Building General Area	(Note 1)	(Note 2)

12	1	Containment Spray Pump Area	Yes	None
13	1	Main Steam Valve House	(Note 3)	(Note 4)
14	1	Main Steam Valve House Basement	Yes	None
15	2	Containment Spray Pump Area	Yes	None
16	2	Main Steam Valve House	Yes	None
17	2	Main Steam Valve House Basement	Yes	None
18	2	Cable Tray Room	Yes	None
19	1	Cable Tray Room	(Note 1)	(Note 2)
20	1	Safeguards Area	(Note 5)	(Note 6)
21	2	Safeguards Area	(Note 5)	(Note 6)

Note:

1. Cable Trays are generally in compliance with the NRC Safety Evaluation Report requirements, with the exception of specific locations where tray covers are needed.
2. Install appropriate cable tray covers at the locations identified in the reference drawing.
3. Dislocated cable tray covers in various locations
4. Rework cable tray covers throughout the whole area to ensure proper positioning and secure installation.
5. Generally in compliance with the NRC Safety Evaluation Report requirements, with the exception of specific locations where inadequate vertical separation distance exists between trays carrying redundant divisions of safety-related cables.
6. Fabricate and install fire barriers at locations identified in the referenced drawings.

2.2 Plant Inspection

In addition to the effort described above, a plant inspection will be conducted to confirm proper installation of cable tray covers in the areas identified above. This inspection will verify that all trays, with the exception of the top tray under a floor slab, have tray covers installed.

This plant inspection shall also identify areas:

- a. Where cable tray risers of one division are horizontally closer than 3 ft from stacked trays of another division.
- b. Where unprotected cables of one division are run across vertically stacked cable trays of another division.

Solid metallic shields or tray covers shall be installed, as necessary

#### Fire Barriers

Fire walls and barriers are used to sectionalize the Surry Power Station into "Fire" zones and are designed to prevent a postulated fire from spreading beyond the local zone barriers. Fire stops are installed in cable trays to prevent the propagation of fire along the tray run.

In order to prevent a postulated fire from spreading through the cable tray system between areas of high combustible material loading (cable insulation), silicone foam will be installed as fire stops as follows:

1. Cable trays passing from Unit No. 1 relay room to emergency switchgear room 1H
2. Cable trays passing from emergency switchgear room 1H to room 1J
3. Cable trays passing from Unit No. 2 relay room to emergency switchgear room 2H
4. Cable trays passing from emergency switchgear room 2H to room 2J

### 3.1.9 FIRE DETECTION SYSTEMS

The new fire detection and alarm system will be a multiplexed system. A new fire protection panel will be installed in the Control Room. It will contain the central processing unit for the system and the operator's console, alarm printer, and a lighted display. The detectors for each zone are connected to a multiplex panel; these multiplex panels are located throughout the plant and are connected in a single loop back to the CPU. All new detector zones as listed above will be Class A as defined in NFPA 72 D. Existing detector zones for both Units 1 and 2 which are Class B will be incorporated onto the new fire detection system and will be upgraded to supervised circuits.

The detectors will be installed in all areas identified by the Safety Evaluation Report.