



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30323

Report Nos.: 50-280/88-07 and 50-281/88-07

Licensee: Virginia Electric and Power Company  
Richmond, VA 23261

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: February 22-26, 1988

Inspector: J. R. Harris

MARCH 10, 1988  
Date Signed

Accompanying Personnel: D. C. Ward

Approved by: T. E. Conlon  
T. E. Conlon, Section Chief  
Engineering Branch  
Division of Reactor Safety

3/14/88  
Date Signed

SUMMARY

Scope: This routine, unannounced inspection was in the areas of fire protection/prevention and follow-up on previously identified inspection items.

Results: One violation was identified: Use of Fire Protection Equipment for Non-Fire Protection Activities, Paragraph 5.f.(2).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*L. Farinholt, Loss Prevention
- \*E. Grecheck, Assistant Station Manager
- \*G. Miller, Licensing Coordinator
- \*R. Morgan, Quality Assurance
- \*W. Robbins, Corporate Loss of Prevention
- \*C. Silcox, Administrative Services

Other licensee employees contacted included construction craftsmen, engineers, technicians, operators, mechanics, security force members, and office personnel.

#### NRC Resident Inspector

- \*L. Nicholson
- \*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on February 26, 1988, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. Dissenting comments were not received from the licensee. The following new item was identified during this inspection.

Violation Item (280, 281/88-07-01) - Use of Fire Protection Equipment for Non-Fire Protection Activities, Paragraph 5.f.(2).

The licensee did identify some material as proprietary during this inspection, but this material is not included in this inspection report.

### 3. Licensee Action on Previous Enforcement Matters

(Closed) Violation (280, 281/87-07-01), Improper Routing of Appendix R Related Cables

Control and power cabling for all onsite emergency diesel generators were located in Fire Area 2. A fire in the Unit 2 cable vault and tunnel could potentially disable Diesel Generators No. 2 and Nos. 1 and 3. Since the

Unit 1 charging pumps are powered by Diesel Generators No. 1 and No. 3, a fire in this area would result in loss of the charging pumps for either unit. Surry power station Deviation Report SI-87-278 was prepared on March 13, 1985 for this issue and a 10 CFR 50.73 Special Report, 87-010-00, was submitted to the NRC on April 10, 1987. The licensee indicated that compensatory measures for the area included a fire watch to inspect the area at least once each shift. Corrective actions are to relocate the Diesel Generator No. 3 cables out of Fire Area 2.

Design Change No. 87-14-3, Emergency Diesel Generator No. 3 cable reroute was issued April 30, 1987 to correct this discrepancy. The design change implementation was completed on May 29, 1987. During this inspection, the inspector did a walkdown and verified that the cable routing had been completed in accordance with the requirements of Design Change No. 87-14-3. This item is closed.

(Open) Unresolved Item (87-07-02), Correct Deficiencies in Fire Contingency Action (FCA) Procedures and Conduct a Detailed Review of All FCA Procedures. During this inspection, the inspector reviewed some of the corrections in the FCA procedures but was not able to verify that all the corrective actions had been implemented. This Unresolved Item remains open.

(Open) Unresolved Item (87-07-03), Provide Practical Shift Crew Training on Fire Contingency Actions (FCA) Procedures. Training will be completed for all shifts by March 11, 1988.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Fire Protection/Prevention Program (64704)

a. Fire Prevention/Administrative Control Procedures

The inspector reviewed the following Fire Prevention/Administrative Procedures:

<u>Procedure No.</u>	<u>Title</u>
FPP	Fire Protection Program
SUADM ADM-20	Special Processes Involving Ignition Source

Based on this review, it appears that the above procedures meet the NRC guidelines of the document entitled, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance," dated June 1977.

## b. Fire Protection Surveillance Procedures

The inspector reviewed the following fire protection system procedures:

<u>Procedure No.</u>	<u>Title</u>
1 PT-47 G	Emergency DC Lighting Self Contain Battery Test, Revision Date May 1, 1987, Monthly
PT-47 H	Emergency DC Lighting Self Contain Battery Test (Emergency Service Water Pump House) Revision Date May 1, 1987, Monthly
PT-47 F	Emergency DC Lighting Self Contain Battery Test (Technical Support Center) Revision Date May 1, 1987, Monthly
PT-47 J	Emergency DC Lighting Self Contain Battery Test (Emergency Diesel Generator Room), Revision Date May 1, 1987, Monthly
1-PT-47-K	Emergency Lighting 8 Hour Battery Discharge Test, Revision Date September 11, 1987, Refueling
PT-47.0	Emergency DC Lighting Test, Revision Date September 11, 1987, Semi-Annual
PT-47 A	Emergency DC Lighting Self Contain Battery Test, Revision Date May 1, 1987, Semi-Annual
PT-47 B	Emergency DC Lighting Self Contain Battery Test Service Building, Revision Date, September 11, 1987, Monthly
2 PT-47 C	Emergency DC Lighting Self Contain Battery Test Turbine Room - Mezzanine Floor, Revision Date May 1, 1987, Monthly
2 PT-47 D	Emergency DC Lighting Self Contain Battery Test, Turbine Room Ground Floor, Revision Date May 1, 1987, Monthly
2 PT-24-11 A	Fire Retardant Coatings and Cable Tray Fire Stops, Revision Date October 30, 1987, Refueling
1 PT-24-11B	Fire Retardant Coatings and Cable Tray Fire Stops, Revision Date January 14, 1988, Every Eighteen Months

<u>Procedure No.</u> (cont'd)	<u>Title</u>
PT-23.7 D	Emergency Driven Fire Pump Battery Test, Revision Date October 1, 1987, Weekly Check
1 PT-24.1	Fire Protection Water Pump Test, Revision Date August 1, 1987, Weekly
PT-24.1A	Fire Protection Testable Valves, Revision Date August 19, 1986, Annually
PT-24.2	High Pressure CO <sub>2</sub> Emergency Service Water Pump House, Revision Date April 13, 1986, Semi-Annually
PT-24.2A	High Pressure CO <sub>2</sub> Systems Fuel Oil Pump House, Revision Date April 11, 1986, Every Six Months
PT-24 4A	Fire Protection Extinguishers and Hose Stations, Revision Date October 9, 1986, Monthly
PT-24.4B	Fire Protection Systems Extinguishers and Hose Stations, Revision Date May 7, 1987, Monthly
PT-24-4D	Fire Protection Extinguishers and Hose Stations, Revision Date May 5, 1987, Monthly
PT-24.4H	Fire Protection Hose Houses and Hydrants, Revision Date August 19, 1986, Monthly
PT-24.5	Vital Area Smoke Detectors Functional Test, Revision Date May 6, 1986, Every Six Months
PT-24.56	Smoke and Thermal Detectors, Robertshaw System, Revision Date December 1, 1987, Every Six Months
1 PT-24.5D	Transformer Fire Protection Functional Test, Revision Date February 26, 1985, Annually
1 PT-24.7	Fire Protection Fixed Suppression Systems, Revision Date October 26, 1987, Quarterly
PT-24.8	Fire Protection Fire Lockers, Revision Date July 13, 1987, Monthly

<u>Procedure No.</u> (cont'd)	<u>Title</u>
PT-24.9	Fire Protection Fire Main Flush, Revision Date May 6, 1986, Every Six Months
PT-24.10	Fire Protection Fire Hose Station Inspection and Flow Test, Revision Date July 30, 1987, Every Eighteen Months
PT-24.11	Fire Barriers, Revision Date September 16, 1986, Every Eighteen Months
PT-24.11A	Fire Doors, Revision Date October 9, 1986, Monthly
PT-24.12	Fire Pump Flow Rate Test, Revision Date September 16, 1986, Annually
PT-24.18	Smoke Detection Power Supply Test, Revision Date August 18, 1987 Monthly
PT-24.19	Fire Protection Flammable Liquid Storage, Revision Date April 24, 1986, Monthly
PT-24.20	Flow Test of Fire Protection System, April 17, 1986, Every Three Years
PT-24.22	Fire Protection Training Services, Revision Date August 19, 1986, Monthly
PT-24.24	Fire Doors, Revision Date March 25, 1986, Daily
PT-24.30	Robertshaw Fire Detection System Test, Revision Date January 16, 1987, Semi-Annually
PT-24.33	Fire Protection Valve Position Surveillance, Revision Date January 28, 1988, Monthly
1 PT-24.31	Fire Protection Fire Hose Station Inspection and Flow Test, Revision Date May 6, 1986, Refueling
1 PT-24.32	Fire Protection Water Spray/Sprinkler Cable Vault and Tunnel, Revision Date April 24, 1986, Every Eighteen Months

<u>Procedure No.</u> (cont'd)	<u>Title</u>
1-PT-24.34	Fire Protection Water Spray/Sprinkler Cable Vault and Tunnel, Revision Date April 13, 1986, Every Three Years
PT-24.35	High Pressure CO <sub>2</sub> T. S. C. Vent Filters, Revision Date April 1, 1986, Every Six Months
PT-24.38	HVAC Fire Damper Operability, Revision Date July 30, 1987, Every Eighteen Months

The above surveillance procedures were reviewed to determine if the various test outlines and inspection instructions adequately implement the surveillance requirements of the plant's fire protection Technical Specifications. In addition, these procedures were reviewed to determine if the inspection and test instructions followed general industry fire protection practices, NRC fire protection programs guidelines and the guidelines of the National Fire Protection Association (NFPA) fire codes. Based on this review, it appears that the procedures are satisfactory.

c. Fire Protection System Surveillance Inspections and Tests.

The inspector reviewed the following surveillance inspections and test records for the dates indicated:

PT 23.7D - Emergency Service Water Pump Battery Weekly Check. Reviewed Weekly Check performed January 5, 11, 28, 25 and February 1, 1988

PT-24-2A - High Pressure CO<sub>2</sub> Pump House, Surveillance Performed Every Six Months. Reviewed surveillances performed April 7, 1987 and October 27, 1987

PT-24.2 - High Pressure CO<sub>2</sub> Emergency Service Water Pump House Check, Six months check of weight of high pressure CO<sub>2</sub> Fire Protection Bottles. Reviewed surveillances performed April 7 and October 13, 1987

1PT 24.1 - Fire Protection Water Pump, Weekly Check. Reviewed weekly checks performed on January 8, 14, 21, 28 and February 4, 1988

PT-24-4A - Fire Protection Extinguishers and Hose Stations Monthly Inspection. Reviewed Inspections performed January 1987 through December 1987

PT-24.5C - Smoke and Thermal Detectors Robertshaw System Inspections performed every six months. Reviewed inspections performed during June and December 1987

1PT 24.7 - Fire Protection Fixed Suppression System, Inspection Performed Quarterly. Reviewed Inspections performed February 24, May 31, August 25 and November 24, 1987

PT-24.8 - Fire Protection Fire Lockers, Monthly Surveillance. Reviewed surveillances performed on January 5, February 6, March 5, April 2, May 7, July 6, July 27, September 2, October 8, November 5 and November 30, 1987

PT-24.9 - Fire Protection - Fire Main Flush, Surveillance performed every six months. Reviewed Surveillances performed April 4 and May 10, 1987

PT 24.12 - Fire Pump Flow Rate Test. Test performed annually. Reviewed test results performed on March 23-26, June 1 and October 23, 1987

PT-24.23 - Fire Protection - Valve Position, Surveillance performed monthly. Reviewed Surveillances performed January through December 1987

PT-24.38 - HVAC Fire Damper Operability, Surveillance performed every Eighteen months. Reviewed Surveillances performed on January 9, 1987

1 PT-24.45 - Emergency Switchgear Room Halon Check, Surveillance performed monthly. Reviewed monthly surveillances performed February through December 1987

PT-24.4B - Extinguishers and Hose Stations, Monthly. Reviewed Surveillances performed between January 1987 and December 1987

PT-24.4H - Hose Houses and Hydrants, Monthly. Reviewed Surveillances performed between January 1987 and February 1988

The surveillance test data and testing frequency associated with the above fire protection system surveillance test/inspections were found to be satisfactory with regard to meeting the requirements of the plant's Fire Protection Technical Specifications. However, during the review of the results associated with PT 24.4H, Hose Houses and Hydrants, the inspector noted additional examples of Violation Item 50-280, 281/88-07-01. See Paragraph 5.f.(2) for a description of this violation.



d. Fire Protection Audit

The most recent audit reports of the fire protection program were reviewed these audits were:

Triennial Fire Protection Audit performed by TERA Corporation,  
November 17-20, 1986

Annual Audit RIS-10-2, of October 20-22 and November 17, 1987

These audits identified several fire protection program discrepancies and recommended several program improvements. The licensee has either implemented the corrective actions associated with these audit findings or a scheduled date for completion of the corrective actions has been established. The licensee appears to be taking the appropriate corrective actions on these audit findings.

e. Fire Brigade

(1) Organization

The total station fire brigade is composed of approximately 70 personnel from the operations and security staff. The on duty shift fire brigade leader is normally one of the operators. The inspector reviewed the on duty shifts for February 1988 and verified that sufficient qualified fire brigade personnel were on duty to meet the provisions of the plant's Technical Specification.

In addition, the inspector verified that sufficient personnel were assigned to each shift to meet the minimum operating and fire brigade staff requirements of the Technical Specifications. Therefore, it appears based on the review of the duty rosters associated with the above dates, that there was sufficient manpower on duty to meet both the operational and the fire brigade requirements of the plant's Technical Specifications.

(2) Training

The inspector reviewed the training and drill records for nine brigade leaders and seven brigade members for 1986 and 1987. The records reviewed indicated that each of these leaders and members had received an annual medical review, attended the required training and participated in the required number of drills. The inspector also verified that a fire brigade drill had been conducted every 92 days for each shift for 1986 and 1987. The fire brigade training records which were inspected were found satisfactory.

(3) Fire Brigade Firefighting Strategies

The inspector reviewed plant and firefighting strategies for the Auxiliary and Containment Building. Firefighting strategies reviewed were Strategy Numbers 143, 144, 145, 146, 147, 156, 157, 158, 159, and 160. The firefighting strategies are presently preliminary and are scheduled to be approved by the plant review committee in March 1988. Training on the strategies is scheduled for the quarter following their approval.

Based on this review, the inspector determined that the preliminary firefighting strategies adequately addressed the fire hazards in the area, the type of fire extinguishants to be utilized, the direction of attack, systems in the room/area to be managed in order to reduce fire damage, heat sensitive equipment in the room/area, and specific fire brigade duties with regard to smoke control and salvage.

(4) Fire Brigade Drill

During this inspection, the inspector witnessed an unannounced fire brigade drill. The drill fire scenario was a fire in the Component Cooling Water (CCW) pump area which was apparently caused by an electrical fault resulting in an oil fire at the A CCW pump.

Six fire brigade members responded to the pending fire emergency. The brigade assembled outside the CCW pump area in full protective firefighting turnout clothing and self contained breathing apparatus. An initial size-up of the fire condition was made by the fire brigade leader and a 1-1/2 inch fire attack hose line and portable extinguishers were advanced into the area. The fire attack hose line was placed in service on the fire and the fire was placed under control in 20 minutes. In addition, the fire brigade initiated fire victim search and rescue, smoke control, and water control operations.

The fire brigade utilized proper manual firefighting methods and reacted to the fire drill scenario in an effective and efficient manner.

f. Plant Tour and Inspection of Fire Protection Equipment

(1) Inspection of Fire Brigade Manual Firefighting Equipment

The inspector performed an inspection of the fire brigade equipment lockers at the fire brigade equipment response location located in the truckbay of the Turbine Building.

A total of four lockers were inspected which contained eight sets of turnout gear (coats, boots, helmets, etc.), eight sets of self contained breathing apparatus, and 24 spare air cylinders are stored just outside the control room in the Turbine Building.

Based on this inspection, the designated fire brigade equipment appeared to be properly maintained and stored in a ready condition.

(2) Outside Fire Protection Walkdown

The inspector verified that the two fire pumps were in service with all essential valves properly aligned. The diesel fuel tank for the diesel driven fire pump was approximately three quarters full of fuel which met the requirements of the Technical Specifications. In addition, the low pressure CO<sub>2</sub> tank was verified to be at least 75% full as required by Technical Specifications.

The following sectional control valves in the outside fire protection water supply system were inspected and verified to be properly aligned and locked in position:

<u>Valve Number</u>	<u>Valve Number</u>
1-FP-35	1-FP-80
1-FP-46	1-FP-81
1-FP-47	1-FP-85
1-FP-48	1-FP-86
1-FP-49	1-FP-87
1-FP-55	1-FP-88
1-FP-56	1-FP-89
1-FP-56A	1-FP-90
1-FP-79	

All fire hydrants and fire hydrant hose houses within the protected area were inspected.

The inspector found that three hose houses (6, 8, and 9) did not contain the minimum equipment required to be maintained in the hose house by Procedure PT 24.4H, Fire Protection Hose Houses and Hydrants. In addition, Hose House 9 is a Technical Specification hose house identified in Section 3.21.A.0. This Technical Specification requires the minimum equipment to be in the hose house for the hose house to be operable.

The inspector followed up on this finding by reviewing the monthly surveillances results associated with PT 24.4H for 1987 and 1988. This review revealed ten additional occurrences where equipment had been removed from Technical Specification hose

houses. Discussions with plant personnel revealed that emergency firefighting equipment was often being removed from the hose houses for non-fire protection uses. This was the case for the three hose houses found missing equipment by the inspector.

The site fire protection organization took immediate corrective action to restock the missing equipment in the three hose houses. However, the plant Fire Protection Program in Section 3.5.1 specifically limits the use of fire protection equipment to preventing, detecting, extinguishing fire or to perform scheduled testing or training unless approved in writing by the Loss Prevention Coordinator. This is identified as Violation Item 50-280, 281/88-07-01, Use of Fire Protection Equipment for Non-Fire Protection Activities.

A tour of the exterior of the plant indicated that sufficient clearance was provided between permanent safety-related buildings and structures and temporary buildings, trailers, and other transient combustible materials. The general housekeeping of the area adjacent to the permanent plant structures was satisfactory.

(3) Permanent Plant Fire Protection Features

A plant tour was made by the inspector. During the plant tour, the following safe shutdown related plant areas and their related fire protection features were inspected:

<u>Fire Area</u>	<u>Description</u>
6	Emergency Diesel Generator Room 1
7	Emergency Diesel Generator Room 2
8	Emergency Diesel Generator Room 3
19	Unit 1 Safeguards
20	Unit 2 Safeguards

The fire/smoke detection systems, manual firefighting equipment (i.e., portable extinguishers, hose stations, etc.) and the fire area boundary walls, floors and ceiling associated with the above plant areas were inspected and verified to be in service or functional.

The CO<sup>2</sup> (Halon) system installed in the three Diesel Generator rooms were inspected and found to be in service.

Based on this inspection, it appears that the fire protection features associated with the above plant areas are satisfactorily maintained.

The plant tour also verified the licensee's implementation of the fire prevention administrative procedures. The control of

combustibles and flammable materials, liquids and gases, and the general housekeeping were found to be very good in the areas inspected.

Two welding operations in the Turbine Building and Service Building were observed. An approved "Hot Work" permit had been issued for each of the welding operations and the work practices met the licensee's fire prevention control procedures.

(4) Appendix R Fire Protection Features

The inspector visually inspected the fire rated raceway fire breaks required for compliance with Appendix R, Section III.G.2 in the following plant areas:

Turbine Building Walkway 40'-6" Elev.  
 Unit 1 Emergency Switchgear and Relay Room  
 Unit 1 cable Vault Tunnel  
 Unit 2 Emergency Switchgear and Relay Room  
 Auxiliary Building 13'-0 Elevation

Based on the inspectors observations of the above raceway fire breaks, it appears that the fire breaks are being properly maintained in a satisfactory condition.

The total flooding CO<sub>2</sub> systems protecting the Unit 1 and 2 Cable Vaults and Tunnels and the total flooding Halon systems protecting the Unit 1 and 2 emergency switchgear and relay rooms were inspected and found to be in service.

The following eight-hour emergency lighting units were inspected:

<u>Unit No.</u>	<u>Location</u>
2ELT 84B	Unit 1 Emergency Switchgear Room
1ELT 74	Unit 1 Cable Vault
1ELT 153	Unit 1 Cable Vault
1ELT 118	Auxiliary Building
2ELT 90	Auxiliary Building

These units were in service, the lamps were properly aligned and appeared to be properly maintained.

The inspector verified that equipment required for operator actions described in the plant Fire Contingency Action procedures was stored in it's designated location in the Service Building. All the required equipment was available at the time of the inspection. In addition, the inspector verified that the equipment needed to facilitate replacement of the CCW pumps, if they were damaged in a fire, was being maintained in the site

warehouse. This equipment is described in Procedure EEMP-C-CC-153, Emergency Installation of Temporary Component Cooling Water Pump Motors. The equipment was found to be maintained and readily available in a designated area of the warehouse.

Except as noted above, within the areas inspected, no additional violations or deviations were identified.

6. Inspector Follow-up Items

(Open) IFI 280, 281/85-37-01, Firefighting Preplans Lack Brigade Guidance in Smoke Control, Fire Damage Control and Fire Suppression Water Runoff Control:

The revised firefighting preplans developed to resolve this IFI were completed by a fire protection contractor in January 1988. These preplans contain the required information to resolve this item; however, at the time of this inspection they had not been approved by the plant review committee. Therefore, this item will remain open.