



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

Report Nos.: 50-280/89-33 and 50-281/89-33

Licensee: Virginia Electric and Power Company
Glen Allen, VA 23060

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: November 13-17, 1989

Inspector: E. D. Tuttle for
W. M. Sartor, Jr.

12/21/89
Date Signed

Accompanying Personnel: D. Collins, NRC
B. Haagensen, Sonalysts, Inc.
F. Kantor, NRR
L. Nicholson, NRC
R. Schin, NRC
R. Serbu, NRR

Approved by: E. D. Tuttle for
W. H. Rankin, Chief

12/21/89
Date Signed

Emergency Preparedness Section
Emergency Preparedness and Radiological
Protection Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, unannounced inspection was the observation and evaluation of the annual emergency exercise. State and local governments participated fully in this exercise.

Results:

In the areas inspected, violations or deviations were not identified.

Based upon the scenario used and the response observed thereto, the licensee fully demonstrated the capability to perform in accordance with the Emergency Plans and Procedures to adequately provide for the health and safety of the public.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *W. Benthall, Supervisor, Licensing
- *W. Cartwright, Vice President, Nuclear Operations
- *D. Christian, Assistant Station Manager, Operations and Maintenance
- *J. Costello, Coordinator, Emergency Planning
- *D. Erickson, Radiation Protection Superintendent
- *A. Friedman, Superintendent, Nuclear Training
- *E. Greckeck, Assistant Station Manager, Nuclear Safety and Licensing
- *J. Higgins, Director, Nuclear Security
- *M. Kansler, Station Manager
- *J. McCarthy, Superintendent, Operations
- *J. Ogren, Superintendent, Maintenance
- *J. O'Hanlon, Vice President, Nuclear Services
- *R. Saunders, Manager, Licensing and Programs
- *W. Stewart, Senior Vice President

Other licensee employees contacted during this inspection included engineers, operators, mechanics, security force members, technicians, and administrative personnel.

NRC Resident Inspector

- *W. Holland
- *L. Nicholson

*Attended exit interview

2. Exercise Scenario (82302)

The scenario for the emergency exercise was reviewed to determine that provisions had been made to test the integrated capability and a major portion of the basic elements existing within the licensee, State, and local Emergency Plans and organization as required by 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Paragraph IV.F, and specific criteria in NUREG-0654, Section II.N.

The scenario was reviewed in advance of the scheduled exercise date and was discussed with licensee representatives on several occasions. The scenario developed for the exercise fully exercised the onsite and offsite emergency organizations of the licensee and provided sufficient emergency information to the State and local government agencies for their full participation in the exercise. The scenario was both challenging and innovative with message inputs that exercised damage control teams with repair activities that were not directly related to accident mitigation. The better than average scenario package was also reflected in exercise

control as the complete and accurate data provided for a consistent player response to the simulated accident.

No violations or deviations were identified.

3. Assignment of Responsibility (82301)

This area was observed to determine that primary responsibilities for emergency response by the licensee had been specifically established and that adequate staff was available to response to an emergency as required by 10 CFR 50.47(b)(1), 10 CFR 50, Appendix E, Paragraph IV.A, and specific criteria in NUREG-0654, Section II.A.

The inspector observed that specific emergency assignments had been made for the licensee's emergency response organization and there were adequate staff available to respond to the simulated emergency.

As the Technical Support Center (TSC) and Emergency Operations Facility (EOF) were established, responsibility and authority were transferred effectively. Priorities for equipment repair and other corrective actions were well-formulated and communicated effectively to repair teams or appropriate plant staff.

No violations or deviations were identified.

4. Emergency Response Support and Resources (82301)

This area was observed to determine that arrangements for requesting and effectively using assistance resources had been made, that arrangements to accommodate State and local staff at the licensee's near-site EOF had been made, and that other organizations capable of augmenting the planned response had been identified as required by 10 CFR 50.47(b)(3), 10 CFR 50, Appendix E, Paragraph IV.A, and specific criteria in NUREG-0654, Section II.C.

State and licensee staff were accommodated at the Local Emergency Operations Facility (LEOF). The licensee included in the exercise, monitoring of the Safety Perimeter Display System (SPDS) status (which was showing actual plant status) in addition to status sheets which contained exercise information. This effort to consult SPDS was to provide a level of reality to licensee response not available using only scenario data sheets. When the SPDS experienced a failure during the exercise, the Controller group took effective action to minimize the disruption to players in the exercise. Licensee contact with offsite organizations was prompt and assistance resources from various agencies were prepared to assist in the simulated emergency.

No violations or deviations were identified.

5. Emergency Classification System (82301)

This area was observed to determine that a standard emergency classification and action level scheme was in use by the nuclear facility licensee as required by 10 CFR 50.47(b)(4), 10 CFR 50, Appendix E, Paragraph IV.C, and specific criteria in NUREG-0654, Section II.D.

An inspector observed that the emergency classification system was in effect as stated in the Radiological Emergency Plan and in the Implementing Procedures. The system appeared to be adequate for the classification of the simulated accident and the emergency procedures provided for initial and continuing mitigating actions during the simulated emergency. A flow chart for classification of events was posted in the EOF and effectively used by EOF support staff. The classifications of each event up to and including the General Emergency were timely.

No violations or deviations were identified.

6. Notification Methods and Procedures (82301)

This area was observed to determine that procedures had been established for notification by the licensee of State and local response organizations and emergency personnel, and that the content of initial and followup messages to response organizations had been established; and means to provide early notification to the populace within the plume exposure pathway had been established as required by 10 CFR 50.47(b)(5), 10 CFR 50, Appendix E, Paragraph IV.D, and specified criteria in NUREG-0654, Section II.E.

An inspector observed that notification methods and procedures had been established and were used to provide information concerning the simulated emergency conditions to Federal, State, and local response organizations and to inform the licensee's augmented emergency response organization.

The licensee used a phone system consisting of direct "ring down" phones to notify offsite authorities of plant status. After the EOF was established, and the State staff was in place in the EOF (approximately 12:30 p.m.), the State representatives in the EOF requested that verbal notifications to the State of licensee recommendations be made to him rather than over the direct phone system. The licensee accommodated this request, but also transmitted copies of the notification forms to the State EOF. The State representative in the EOF assumed the responsibility of communicating verbally the licensee's recommendations to the State. The State representative noted an error on the licensee's notification form Number 9, which showed the licensee had made a protective action recommendation (PAR) of evacuation 360° out to two miles, when in fact the recommendation had been to shelter this area. Notification form 8 also contained this error.

Periodic meetings were held between the licensee and the State representatives in the EOF to discuss in detail the plant status, projected plant status, and the status of State protective response.

No violations or deviations were identified.

7. Emergency Communications (82301)

This area was observed to determine that provisions existed for prompt communications among principal response organizations and emergency personnel as required by 10 CFR 50.47(b)(6), 10 CFR 50, Appendix E, Paragraph IV.E, and specified criteria in NUREG-0654, Section II.F.

Communications among the licensee's emergency response facilities and emergency organization and between the licensee's emergency response organization and offsite authorities appeared adequate. No communications related problems were identified during this exercise.

No violations or deviations were identified.

8. Public Education and Information (82301)

This area was observed to determine that information concerning the simulated emergency was made available for dissemination to the public as required by 10 CFR 50.47(b)(7), 10 CFR 50, Appendix E, Paragraph IV.D, and specific criteria in NUREG-0654, Section II.G.

Information was provided to the media and the public in advance of the exercise. The information included details on how the public would be notified and what initial actions they should take in an emergency. A rumor control program was in place. A Local Media Center was established and appeared adequately equipped and coordinated.

No violations or deviations were identified.

9. Emergency Facilities and Equipment (82301)

This area was observed to determine that adequate emergency facilities and equipment to support an emergency response were provided and maintained as required by 10 CFR 50.47(b)(8), 10 CFR 50, Appendix E, Paragraph IV.E, and specific criteria in NUREG-0654, Section II.H.

The inspector observed the activation, staffing, and operation of selected emergency response facilities. No equipment deficiencies were observed during the exercise.

No violations or deviations were identified.

10. Accident Assessment (82301)

This area was observed to determine that adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition were in use as required by 10 CFR 50.47(b)(9), 10 CFR 50, Appendix E, Paragraph IV.B, and specific criteria in NUREG-0654, Section II.I.

The accident assessment program included both an engineering assessment of plant status and an assessment of radiological hazards to both onsite and offsite personnel resulting from the accident. Both programs appeared effective during this exercise in analyzing the plant status so as to make recommendations to the Station Emergency Manager concerning mitigating actions to reduce damage to plant equipment, to prevent release of radioactive materials and to terminate the emergency condition.

No violations or deviations were identified.

11. Protective Responses (82301)

This area was observed to determine that guidelines for protective actions during the emergency, consistent with Federal guidance, were developed and in place, and protective actions for emergency workers, including evacuation of nonessential personnel, were implemented promptly as required by 10 CFR 50.47(b)(10), and specific criteria in NUREG-0654, Section II.J.

An inspector verified the licensee had emergency procedures for formulating PARs for offsite populations within the 10-mile emergency planning zone (EPZ). Following the General Emergency declaration, the Station Emergency Manager and the Recovery Manager had difficulty determining the applicable PARs within the time requirements to make the recommendation to the offsite authorities. Despite this difficulty, the PAR was made appropriately within 15 minutes of identification of conditions warranting a General Emergency declaration. The major reason for the difficulty appeared to be the licensee's PAR procedure, EPIP-1.05, which differs from the simple flow chart of I&E Notice 83-26 and was confusing to follow. During the critique, the licensee identified the cumbersomeness of EPIP-1.05 for determination of PARs as needing corrective action as well as identifying a need for enhanced training on the use of EPIP-1.05 in determining PARs. The licensee's corrective action to enhance PAR decision making will be tracked via inspector followup item (IFI) 50-280, 281/89-33-01.

The protective actions instituted for onsite emergency workers included periodic radiation surveys, exposure control, and contamination control as required. The licensee also demonstrated the ability to conduct assembly and accountability of personnel within the protected area.

No violations or deviations were identified.

12. Exercise Critique (82301)

The licensee's critique of the emergency exercise was observed to determine that deficiencies identified as a result of the exercise and weaknesses noted in the licensee's emergency response organization were formally presented to licensee management for corrective actions as required by 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Paragraph IV.E, and specific criteria in NUREG-0654, Section II.N.

A licensee critique of the emergency exercise was held on November 17, 1989, with exercise controllers, key exercise participants, licensee management, and NRC personnel attending. The critique was the best one observed to date by the team leader. It was well organized and addressed each of the exercise objectives. Those areas that required either corrective action or further evaluation had been grouped into functional areas for followup. The critique was presented from a viewpoint of securing emergency preparedness program enhancements rather than taking credit for those areas that went well.

No violations or deviations were identified.

13. Federal Evaluation Team Report

The report by the Federal Evaluation Team (Regional Assistance Committee and Federal Emergency Management Agency, Region II staff) concerning the activities of offsite agencies during the exercise will be forwarded by separate correspondence.

14. Action on Previous Inspection Findings (92701)

- a. (Closed) IFI 50-280, 281/87-29-04: Provide security at the LENC during exercises and/or events. The relocated LENC on licensee property provides for security with the road blocks established to control access to the site during an emergency.
- b. (Closed) IFI 50-280, 281/87-29-10: Assure that offsite monitoring teams conduct environmental monitoring in accordance with EPIP-4.16. Licensee evaluation of offsite monitoring teams indicated procedural adherence.
- c. (Closed) IFI 50-280, 281/89-07-01: Failure to demonstrate the ability to augment the onsite emergency organization in a timely and effective manner. The licensee had revised personnel assignments to its emergency organization to make timely and effective staffing of its emergency organization as observed during this exercise.
- d. (Closed) IFI 50-280, 281/89-07-02: Failure to establish radiological access control to Control Room, TSC, and LEOF following an onsite radiological release. The licensee documented radiological access control to these facilities during the exercise.

15. Exit Interview

The inspection scope and results were summarized on November 17, 1989, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

Item NumberDescription and Reference

50-280, 281/89-33-01

IFI: Review and revise as necessary
PAR procedure EPIP 1.05 to enhance
decisionmaking (Paragraph 11).

Attachment:
Scope, Objectives, and Scenario
Timeline

VIRGINIA POWER
SURRY POWER STATION
NOVEMBER 1989 EMERGENCY EXERCISE

EXERCISE SCOPE

On November 15, 1989, Virginia Electric and Power Company will demonstrate its ability to implement the Surry Power Station Emergency Plan. The purpose of this exercise is to activate and evaluate major portions of the Emergency Plan, associated implementing procedures, and selected portions of the Corporate Emergency Response Plan in accordance with 10CFR50.47(b) (14), and to support the implementation of state and local government emergency response plans as required by the Federal Emergency Management Agency.

This exercise will be held in conjunction with emergency response demonstrations by the Commonwealth of Virginia, the counties of James City, Isle of Wight, Surry, and York, as well as the cities of Newport News and Williamsburg. The exercise will demonstrate that those individuals and agencies assigned responsibilities in a radiological emergency are capable of providing the necessary protective measures to ensure the health and safety of the public in the event of an accident at the Surry Power Station.

The exercise will demonstrate responses to the four emergency classes established by NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans Preparedness in Support of Nuclear Power Stations. A scenario will be prepared to accomplish a successive escalation through these emergency classes. Free play is encouraged and controllers will only interfere with participant's response if the exercise lags behind schedule, if emergency response personnel take inappropriate actions to carry them to the next event, or if action is taken that would correct the expected simulated response earlier than scheduled by the scenario. At no time will the exercise be permitted to interfere with the routine safe operation of the station. Station management may, at their discretion, suspend the exercise for any period of time necessary to ensure this goal. Exercise participants will not have prior knowledge of the simulated incident or any parts thereof.

VIRGINIA POWER
SURRY POWER STATION
NOVEMBER 1989 EMERGENCY EXERCISE

OBJECTIVES SUMMARY

The objectives of this exercise are to demonstrate by actual performance a number of key emergency preparedness functions as they relate to the Surry Power Station Emergency Plan. The simulated accident will involve: emergency classification, notifications of company and off-site organizations, simulated actions to correct the emergency condition, and initiation of accident assessment and protective actions as necessary to cope with the event, which will include a simulated off-site radiological release. The intent of this effort is to demonstrate the adequacy of the Surry Power Station Emergency Plan, the Emergency Plan Implementing Procedures (EPIPs), the Corporate Emergency Response Plan, and the Corporate Plan Implementing Procedures (CPIPs). Simulations of some aspects of emergency preparedness, without actual demonstrations by the Station or Corporate entities, may occur where it is impractical to call for personnel involvement.

The following objectives have been developed in order to establish the scope of the 1989 Surry Emergency Exercise. The objectives ensure that required events are included in the exercise scenario, and establish criteria to be evaluated by controllers and observers during the conduct of the exercise.

**VIRGINIA POWER
SURRY POWER STATION
NOVEMBER 1989 EMERGENCY EXERCISE**

OBJECTIVES

1. Demonstrate the ability of the emergency response organization to activate the Surry Power Station and Corporate Emergency Plans and use the appropriate associated implementing procedures.

The Surry Power Station and Corporate emergency response organizations will demonstrate this objective. The initial activation will start in the Control Room.

All Surry Power Station and Corporate response facilities will be manned and perform prescribed functions in accordance with implementing procedures as appropriate to the development of the exercise scenario.

The following Surry Power Station and Corporate emergency response organizations located within the following facilities will participate in this exercise:

- (1) Control Room (CR)
- (2) Technical Support Center (TSC)
- (3) Operational Support Center (OSC)
- (4) Local Emergency Operations Facility (LEOF)
- (5) Corporate Emergency Response Center (CERC)
- (6) Joint Public Information Center (JPIC)
- (7) Local Media Center (LMC)

Other emergency response personnel, not located within the listed facilities, will also participate in this exercise including Security, Chemistry, and Health Physics.

2. Demonstrate the ability to analyze station conditions, assess Emergency Action Level (EAL) parameters and correctly classify the emergency.

The Control Room and the TSC will demonstrate this objective by initiation and use of appropriate operational procedures and EPIP-1.01.

The use of the Emergency Response Facility Computer System (ERFCS) will be simulated during the exercise. Status sheets detailing radiological monitor and operational trend data will be issued on a periodic time interval. The ability to access the ERFCS or to acquire the data by back-up methods will be demonstrated in each facility.

During the conduct of this exercise, the Station Emergency Manager might choose to escalate the emergency classification to a higher level than prescribed by the EALs. If this situation occurs, the controller will block this escalation to conform to state timeline requirements.

3. Demonstrate the ability to assemble, dispatch and control on-site emergency teams to perform response activities.

As appropriate, the Control Room, TSC and OSC will demonstrate this objective by dispatching and controlling teams necessary to respond to events within the Surry Power Station protected area. The ability to brief emergency teams and establish appropriate protective measures, and appropriate communications will be demonstrated.

Prior to activation of the emergency response facilities, this objective will be demonstrated by the Control Room through the use of appropriate procedures. After activation of the TSC and OSC, the TSC and OSC will demonstrate this objective by implementing the requirements of EPIP-3.03 and 5.08.

4. Demonstrate the ability to notify and mobilize the Surry Power Station and Corporate emergency response organizations.

The Control Room and Security will demonstrate this objective by making appropriate notifications per EPIP-1.03 and the Surry Power Station Emergency Telephone Directory. Corporate Security will demonstrate this objective by making the appropriate notifications to corporate personnel.

5. Demonstrate the ability to notify the state, local governments and the NRC within the required time limits.

As appropriate, the Control Room, TSC and LEOF will demonstrate this objective.

The Control Room, TSC and LEOF will demonstrate the ability to provide accurate up-to-date information to the federal, state and local governments.

- a. State and Local Government Notification

Information for these notifications will be identified and recorded by the Emergency Communicator (EC) on EPIP-2.01, Attachment 1 (Report of Emergency to State and Local Governments) and Attachment 2 (Report of Radiological Conditions to the State). Upon approval by the Station Emergency Manager (SEM), the EC will transmit the information, as appropriate, to the state and/or local governments.

The 15-minute clock for completing the initial notification will begin when the SEM declares the emergency classification. After initial notification, the EC will perform follow-up communications approximately every 30 minutes or as conditions change using EPIP-2.01, Attachment 1.

As conditions warrant, the ability to transmit protective action recommendations (PARs) to the state will be demonstrated in accordance with appropriate procedures.

The initial Report of Radiological Conditions to the State (EPIP-2.01, attachment 2) will be transmitted when the data is gathered and recorded. Follow-up notifications regarding radiological conditions will be performed by the EC approximately every 30 minutes or as radiological conditions change.

The State may waive or alter any follow-up reporting requirements.

The responsibility for making State and local government notifications will remain with the SEM, either in the Control Room or TSC, until the LEOF is activated. This notification responsibility will then transfer to the Recovery Manager (RM) located in the LEOF.

b. NRC Notification

Unless otherwise directed, the NRC will be contacted for the initial classification, within one hour, and once again when the exercise terminates. The initial notification will be made by the EC from the Control Room using EPIP-2.02, attachment 1 (NRC Event Notification Worksheet). The termination notification will be made by the EC from the TSC using EPIP-2.02, attachment 2 (NRC Emergency Communicator Log). After initial notification, the EC will maintain the NRC Emergency Communicator Log as plant conditions change to simulate maintaining continuous phone contact.

Unless required to be maintained through contact with the NRC during the initial notifications, the Health Physics Network (HPN) phone contact will be simulated from the TSC and LEOF.

The responsibility for making NRC notifications will remain with the SEM, either in the Control Room or TSC. Once the LEOF is activated, the RM will assume the responsibility for notifications via the HPN.

Maintaining contact with the NRC via the Emergency Notification System (ENS) and the HPN will be simulated by controllers.

6. Demonstrate the ability to conduct assembly and accountability of personnel within the protected area.

The Control Room and Security will demonstrate this objective in accordance with EPIP-1.03 and 5.03. Additionally, the Assembly Area Leaders will perform area accountability to support the overall accountability process.

7. Demonstrate the ability to perform assessments of on-site and off-site conditions to support the formulation of Protective Action Recommendations (PARs).

As appropriate, this objective will be demonstrated by the Control Room, TSC and the LEOF. The Control Room and TSC will monitor plant conditions to support the formulation of PARs, and will transfer the responsibility to the LEOF upon activation.

Radiological data generated during the development of this exercise ensures the level of response commensurate with the exercise objectives. However, certain radiological parameters may be artificially elevated and do not necessarily reflect actual plant dynamic data.

8. Demonstrate the ability to formulate protective actions for emergency response personnel, including area access control, contamination control, exposure control, use of protective devices and, if appropriate, the process for administration of potassium iodide (KI).

This objective will be demonstrated through an interface among the Control Room, TSC and OSC where the TSC will monitor and authorize protective actions for site access, contamination control and exposure control. The TSC, via the Radiation Protection Supervisor (RPS) located in the Health Physics area, will dispatch and direct teams within the bounds of the site property per EPIP-4.01 and 4.02 and associated procedures to monitor radiological conditions and provide protective measures for site emergency response personnel. When directed by the SEM, Security will implement access control measures in accordance with EPIP-5.04. The OSC staff and other site personnel will implement any necessary actions associated with protective equipment requirements, in-plant access control and, if appropriate, simulate KI administration.

As necessary, on-site Surry Power Station emergency response personnel shall don appropriate protective clothing within the plants' radiological control area (RCA). When outside a plant RCA, the wearing of protective clothing will be simulated. The ability to don and verify proper fit of respiratory protection equipment will be initially demonstrated and simulated thereafter.

If necessary, the Control Room and/or TSC and the OSC will demonstrate the process for authorizing exposure extensions, to include emergency exposure authorization in accordance with EPIP-5.06 and 4.04.

If required, the TSC will direct evacuation of designated non-essential personnel from the site per EPIP-5.05, and Health Physics will demonstrate the ability to monitor the evacuees in accordance with EPIP-4.21.

9. Demonstrate the ability to perform off-site dose assessment.

As appropriate, this objective will be demonstrated by the Control Room, TSC and LEOF. The ability to perform initial dose assessment will be demonstrated through the implementation of EPIP-4.08 and followup assessments through the use of other associated implementing and station procedures.

Field monitoring teams will be dispatched per EPIP-4.01 and 4.02 to support the dose assessment effort. These teams will perform their functions in accordance with EPIP-4.15 and 4.16. These teams will be dispatched by the RPS and, as appropriate, directed by the RPS, TSC or LEOF.

With the exception of hand protection, the use of protective clothing and respiratory protection equipment will be simulated.

10. As appropriate, demonstrate the ability of Health Physics and Chemistry to conduct radiological monitoring activities, including dose rates, sample collection and sample analysis.

As required, radiological monitoring, sampling and analysis for in-plant and/or on-site activities will be initiated in accordance with EPIP-4.02. If necessary, post accident sampling activities will be performed in accordance with EPIP-4.22 and 4.23. The field monitoring teams will perform radiological monitoring activities in accordance with EPIP-4.15 and 4.16. Simulated radiological, sample collection and analyses data will be provided by controllers upon completion of appropriate actions.

Simulated reactor coolant and/or containment sump/air samples may be obtained utilizing the High Radiation Sampling System (HRSS). Radiological data necessary to adequately test response and monitoring capabilities will be provided by the controller during sample acquisition. Isotopic analysis data will be provided upon demonstration of proper sample preparation and counting delay times.

11. Demonstrate the ability to effectively activate the emergency response facilities.

The Control Room, TSC, OSC, LEOF, CERC, JPIC and LMC will demonstrate this objective in accordance with appropriate procedures.

12. Demonstrate that facility layout and equipment adequately support emergency response activities in each facility.

The Control Room, TSC, OSC, LEOF, CERC, JPIC and LMC will demonstrate this objective.

13. Demonstrate the ability to communicate with appropriate locations, organizations, and field personnel.

Communications will be demonstrated among the Control Room, TSC, OSC, LEOF, CERC, JPIC, LMC and field teams. The field monitoring teams shall implement the requirements of EPIP-4.19.

Backup communication systems will be demonstrated only if primary communications systems fail.

14. Demonstrate the ability of the Station Emergency Manager (SEM) to maintain control of the emergency response effort on-site and the Recovery Manager (RM) to maintain overall control of the emergency response effort once the LEOF is activated.

The SEM will demonstrate on-site emergency response control from the Control Room and TSC. The RM will demonstrate overall control of the emergency response effort from the LEOF and the Protective Action Recommendation process.

The SEM keeps the personnel within the protected area informed through the use of emergency alarms and the site Gai-Tronics (plant paging) system. Remaining site personnel will be notified by other verbal communication methods. All announcements must be preceded with "This is a drill."

Also the Control Room, TSC and LEOF will demonstrate the ability to transfer appropriate command functions.

The Control Room functions that will transfer to the TSC include:

- (1) Notifications to the State and local governments and the NRC
- (2) Providing PARs to the State
- (3) Determining the emergency classification
- (4) Authorizing emergency exposures

The TSC functions that will transfer to the LEOF are:

- (1) Notifications to the State and local governments and communication to the NRC via the HPN.
- (2) Providing PARs to the State.

15. Demonstrate the ability to provide continuous emergency response capability.

The emergency response organizations within the emergency response facilities will demonstrate this objective by formulating a shift relief roster; however, an actual shift turnover will not be performed.

As appropriate, the ability to provide logistical support for emergency response personnel will also be demonstrated/simulated.

16. Demonstrate the ability to provide basic life support, package and transport a contaminated injured person to an off-site medical facility.

This objective will be demonstrated by the First Aid Team implementing procedures appropriate for the level of injury incurred by the victim and Health Physics employing the necessary radiological controls to remove the contaminated victim from the accident scene. An off-site rescue unit will demonstrate the ability to respond to Surry Power Station. The injured victim will be transported to an off-site medical facility. The off-site medical facility will demonstrate the ability to treat a contaminated injured person.

When the contaminated injured person is transported, the station emergency response organization will perform the requirements of EPIP-4.20 and 5.01.

17. Demonstrate the ability to coordinate preparation, review and release accurate information to the public in a timely manner.

The CERC, JPIC and LEOF will demonstrate this objective by the implementation of CPIP-1.0 and the CPIP-2 series procedures.

Press releases shall be prepared at the CERC until the LEOF is prepared to assume the responsibility. Once the LEOF is activated, the LEOF shall prepare the press releases and transmit them to the CERC for editing. Press releases shall be issued after approval by the Recovery Manager and/or the Corporate Response Manager.

The initial press release will be transmitted to the Associated Press and United Press International.

All press releases shall be brought to the attention of the Chief Technical Spokesman. The Chief Technical Spokesman shall then make the press releases available to the media in the JPIC and LMC. For the purposes of this exercise, personnel impersonating media correspondents will be available to ask questions.

18. Demonstrate the ability to establish and operate rumor control functions.

This objective will be demonstrated by the establishment of a special emergency hotline by Public Affairs personnel in accordance with CPIP-2.1 and 2.3. The personnel staffing the emergency hotline will be periodically contacted by a controller to determine their response to various questions related to the accident

19. Demonstrate the establishment of a recovery organization and the initiation of recovery actions.

The Station Emergency Manager and Recovery Manager will demonstrate this objective by implementing EPIP-6.01 and/or CPIP-6.5.

The recovery aspects of the exercise will be to establish a recovery plan and organization to return the station to a normal status.

20. Demonstrate the ability of the emergency response organization to conduct a self-critique and identify improvement areas.

The Control Room, TSC, OSC, LEOF, CERC, JPIC, LMC and field monitoring teams will conduct a self-critique to identify weaknesses and improvement items.

OBJECTIVES DEMONSTRATION MATRIX

FACILITY ORGANIZATION/ OBJECTIVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CONTROL ROOM	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X				X
OPERATIONAL SUPPORT CENTER	X		X			X		X			X	X	X		X	X				X
TECHNICAL SUPPORT CENTER	X	X	X		X	X	X	X	X		X	X	X	X	X	X			X	X
LOCAL EMERGENCY OPERATIONS FACILITY	X				X		X		X		X	X	X	X	X		X		X	X
CORPORATE EMERGENCY RESPONSE CENTER	X										X	X	X		X		X	X		X
JOINT PUBLIC INFORMATION CENTER	X										X	X	X		X		X	X		X
LOCAL MEDIA CENTER	X										X	X	X		X					X
SECURITY	X			X		X		X					X		X	X				X
HEALTH PHYSICS AND CHEMISTRY	X					X		X	X	X			X		X	X				X

EVENT SUMMARY
FORWARD

Any emergency exercise must have a significant effort put forth in research and development to ensure that the events depicted are as realistically possible as can be simulated through the use of cue cards, signs, etc. For discussion purposes, these events can generally be broken down into two categories:

1. Human Error, and
2. Equipment Malfunction.

The first, human error, is the easiest and more flexible of the two categories to identify in a scenario; however, no one likes to assume that they will make mistakes, especially of the magnitude to cause significant plant damage or off-site consequences. This does not, however, preclude using this means to provide input into the scenario, since the possibility for human error does exist based on the amount of human judgement involved in implementing emergency response actions for off-normal plant events.

The second category, equipment malfunction, is much harder to incorporate into a scenario, especially where it is needed to cause plant damage that creates a serious problem to the off-site environment. This is true because of the tremendous effort placed on equipment reliability and redundancy during design, fabrication and installation of systems at nuclear power facilities. The Safety Analysis Report, written for all nuclear facilities, including the Surry Power Station, analyzes the capabilities of plant systems to maintain control over radioactive material within the plant during all types of off-normal plant incidents. Thus, in order to incorporate equipment-related problems into the scenario, some unrealistic assumptions must be made.

Additionally, the public's perception of the exercise scenario often times leads them to believe that these events may very well be probable. However, it should be known that if the events in the exercise scenario presented within were at all possible, an unanswered safety question would exist and actions would be taken to rectify the situation.

Thus, in order to achieve a sequence of events that will lead to a significant plant problem, the exercise scenario must contain an incredible plant situation, and unlikely series of equipment failures, or an improbable operator error combined with equipment failures.

VIRGINIA POWER
SURRY POWER STATION
NOVEMBER 1989 EMERGENCY EXERCISE
SCENARIO NARRATIVE

A full scale emergency exercise is scheduled to be conducted at the Surry Power Station on November 15, 1989. For the purposes of the exercise, Unit 1 has been designated as the affected unit.

Unit 1 is operating at 100% full power equilibrium conditions with some known fuel leakage present. 1-SI-P-1A, "A" Low Head Safety Injection Pump, is in the "Alert" range due to high pump vibrations. Plans are to bring the unit to Cold Shutdown conditions to replace the failed fuel during the upcoming Thanksgiving holiday.

Unit 2 is operating at 100% full power equilibrium conditions with one Charging Pump out of service. A small Steam Generator tube leak of 0.06 gallons per day exists in the "A" Steam Generator.

The exercise will be initiated by a Unit 1 turbine blade failure that does not penetrate the turbine casing but results in turbine vibrations increasing above the setpoint requiring unit trip. A "NOTIFICATION OF UNUSUAL EVENT" will be declared.

Shortly after the turbine trip/reactor trip, increased fission product release from the leaking fuel assemblies will cause primary coolant system activity to rise. Conditions requiring the declaration of an "ALERT" will then be achieved.

Following unit stabilization and evaluation of conditions, a normal plant cooldown will commence. Approximately 3 hours after the unit trip, Unit 1 will experience a Reactor Coolant System leak from the pressurizer surge line. This leak will rapidly propagate into a complete surge line failure and a large Loss of Coolant Accident (LOCA) which is confined to the Containment Building. Plant conditions will require declaration of a "SITE AREA EMERGENCY."

Approximately 45 minutes following the LOCA, automatic Recirculation Mode Transfer will realign the Safety Injection System to cold leg recirculation. Following alignment to the Recirculation Mode, one of the Low Head Safety Injection (LHSI) pumps will experience a seal failure which results in a loss of reactor coolant to the LHSI pump cubicle. This reactor coolant system leak outside of the Containment Building will result in an offsite release through the Ventilation Vent System. A "GENERAL EMERGENCY" will be declared based on a breach of the three fission product barriers.

The escalation through the emergency classifications will provide activities designed to exercise both onsite and offsite response organizations. Sufficient time will be permitted to allow the response organizations to perform the required assessment and appropriate response actions.

VIRGINIA POWER
SURRY POWER STATION
NOVEMBER 1989 EMERGENCY EXERCISE

SCENARIO CHRONOLOGY

NOTE: TIMES ARE APPROXIMATE

<u>TIME</u>	<u>EVENT</u>
0700	- Initial conditions distributed.
0800	- Controllers/observers positioned. Controllers perform any necessary participant briefings (i.e., exemptions).
0845	- Operations Department participants positioned in the Main Control Room.
0900	- Unit 1 Main Turbine experiences a thrown blade. - Annunciator J-E-5 (ROTOR ECCENTRICITY VIBRATION). - Main turbine vibration recorder indicates 14.6 mils on #4 turbine bearing. - #4 Bearing red alarm light lit on Turbine Supervisory Panel Vibration Alarm Module.
0903	- Manual reactor and turbine trips performed in accordance with AP-8.00. - Annunciator E-B-8 (MANUAL RX TRIP). - Annunciator F-B-1 (MANUAL TURBINE TRIP). - Annunciator F-A-1 (TURBINE TRIPPED BY REACTOR TRIP). - Annunciator E-A-9 (RX TRIP BREAKERS OPENED). - EP-1.00, Reactor Trip / Safety Injection, implemented. - All other expected annunciators for a normal reactor trip received. - All plant parameters trending as expected for a normal reactor trip.
0906	- Procedure transition made to EP-1.01, Reactor Trip Recovery. - Operators dispatched to inspect in the Turbine Building for equipment damage. - EPIP-1.01, Station Emergency Manager Controlling Procedure, implemented.
0915	- Initiate 1-OP-3.1, Unit Shutdown from 2% to HSD. - Letdown radiation monitor (RM-CH-118 & RM-CH-119) indications begin to increase.
0918	- Source Range NIS detectors automatically re-energize.
0920	- NOTIFICATION OF UNUSUAL EVENT declared (Tab K-13) based on Turbine rotating component failure without casing penetration resulting in unit trip.

TIMEEVENT

- 0920 - Annunciator RM-E-7 Upper Window (RX COOLANT LETDOWN LOW ALERT)
(RM-CH-118 reading 1×10^4 cpm).
- AP-5.12, Reactor Coolant Letdown Monitors, initiated.
- 0923 - Annunciator RM-E-7 Lower Window (RX COOLANT LETDOWN LOW HIGH).
- Annunciator RM-E-8 Upper Window (RX COOLANT LETDOWN HIGH ALERT)
- (RM-CH-118 & RM-CH-119 reading 1×10^5 cpm).
- 0927 - Annunciator RM-E-8 Lower Window (RX COOLANT LETDOWN HIGH HIGH).
- RM-CH-118 & RM-CH-119 indicate 6×10^5 cpm.
- 0930 - Commence establishing conditions to perform unit cooldown.
- RM-CH-118 & RM-CH-119 stabilize at 7×10^5 cpm.
- 0956 - Annunciator D-A-1 (BORIC ACID TANK 1A HI-LO LEVEL CH-1).
- Annunciator D-B-1 (BORIC ACID TANK 1A HI-LO LEVEL CH-2).
- 0957 - ALERT declared (Tab C-2) based on primary system activity RM-CH-118
increase within 30 minutes and remains greater than 5×10^5 cpm for 15
minutes).
- 0958 - Annunciator D-A-2 (BORIC ACID TANK 1A LO-LO LEVEL CH-1).
- Annunciator D-B-2 (BORIC ACID TANK 1A LO-LO LEVEL CH-2).
- 1000 - Boric Acid Transfer Pump (1-CH-P-2B) fails.
- Operator dispatched to investigate pump failure and lineup 1-CH-P-2C
to recirculate the "B" Boric Acid Storage Tank.
- 1020 - First Aid Drill commences.
- 1030 - Cold Shutdown boration completed.
- Chemistry requested to verify Cold Shutdown Boron concentration.
- 1055 - Chemistry confirms CSD boron concentration.
- 1059 - Secure 1-RC-P-1B.
- Annunciator E-A-3 (RX COOL LOOP 1B LOW FLOW CH-1).
- Annunciator E-C-3 (RX COOL LOOP 1B LOW FLOW CH-3).
- Annunciator E-D-3 (RX COOL LOOP 1B LOW FLOW CH-2).
- Annunciator H-B-2 (dT DEVIATION LOOP 1B >/< LOOP 1C).
- RVLIS dynamic head indication goes from 107% to 61%.
- 1101 - Secure 1-RC-P-1A.
- Annunciator E-A-2 (RX COOL LOOP 1A LOW FLOW CH-1).
- Annunciator E-B-2 (RX COOL LOOP 1A LOW FLOW CH-2).
- Annunciator E-C-2 (RX COOL LOOP 1A LOW FLOW CH-3).
- Annunciator H-A-2 (dT DEVIATION LOOP 1A >/< LOOP 1B).
- Annunciator H-C-2 (dT DEVIATION LOOP 1A >/< LOOP 1C).
- RVLIS dynamic head indication goes from 61% to 41%.

TIMEEVENT

- 1103 - Begin primary plant cooldown and depressurization.
- 1105 - Annunciator E-B-4 (AMERTAP PIT HIGH LEVEL).
 - Operator dispatched to investigate Amertap Pit alarm.
- 1145 - Small RCS leak develops in the Pressurizer Surge Line.
- 1147 - Annunciator RM-C-7 Upper Window (CONTAINMENT GAS ALERT).
 - Annunciator RM-C-7 Lower Window (CONTAINMENT GAS HIGH).
- 1150 - Annunciator RM-C-8 Upper Window (CONTAINMENT PART ALERT).
 - Annunciator RM-C-8 Lower Window (CONTAINMENT PART HIGH).
- 1154 - Annunciator C-D-8 (PRZ LO LEVEL).
- 1156 - Manual Safety Injection due to decreasing pressurizer level.
 - EP-1.00, Reactor Trip / Safety Injection initiated.
 - RI-RM-161, Cont Hi Rng Gamma, reading 2 x E2 mR/Hr.
 - RI-RM-162, Manipulator Crane, reading 1 x E3 mR/Hr.
 - RI-RM-159, Containment Particulate, reading > 1 x E6 cpm.
 - RI-RM-160, Containment Gaseous, reading > 1 x E6 cpm.
 - Victoreen Vent-Vent RM indicates a "Flow Fault" condition.
- 1200 - Pressurizer Surge Line ruptures causing a large-break LOCA.
 - High-High Consequence Limiting Safeguards actuation occurs due to increasing containment pressure.
 - Annunciator A-A-4 (ACCUM TK 1A HI-LO LV).
 - Annunciator A-A-5 (ACCUM TK 1B HI-LO LV).
 - Annunciator A-A-6 (ACCUM TK 1C HI-LO LV).
 - Annunciator A-B-4 (ACCUM TANK 1A HI-LO PRESS).
 - Annunciator A-B-5 (ACCUM TANK 1B HI-LO PRESS).
 - Annunciator A-B-6 (ACCUM TANK 1C HI-LO PRESS).
 - Annunciator A-A-8 (RWST CHEM ADD TK LO LEVEL).
 - Annunciator A-F-4 (SIS INITIATED).
 - Annunciator B-B-4 (CLS HI TRAIN A).
 - Annunciator B-B-5 (CLS HI TRAIN B).
 - Annunciator B-B-7 (CONT PARTIAL PRESS +0.1 PSI CH-2).
 - Annunciator B-A-7 (CONT PARTIAL PRESS +0.1 PSI CH-1).
 - Annunciator B-C-2 (RCP FRAME ALERT).
 - Annunciator B-C-4 (CLS HI-HI TRAIN A).
 - Annunciator B-C-5 (CLS HI-HI TRAIN B).
 - Annunciator B-C-6 (CONT PARTIAL PRESS +0.25 PSI CH-1).
 - Annunciator B-D-6 (CONT PARTIAL PRESS +0.25 PSI CH-2).
 - Annunciator B-E-4 (RCP FRAME DANGER).
 - Annunciator B-F-6 (CTMT INST AIR HDR LO PRESS).
 - Annunciator B-H-1 (RTD BYPASS LINE 1C LOW FLOW).
 - Annunciator C-A-1 (RCP 1A CC RETURN LO FLOW).
 - Annunciator C-A-5 (RCP 1A SEAL WATER RETURN LO d-PRESS).
 - Annunciator C-B-1 (RCP 1B CC RETURN LO FLOW).

TIMEEVENT

- 1200 - Annunciator C-B-5 (RCP 1B SEAL WATER RETURN LO d-PRESS).
- Annunciator C-B-8 (PRZ LO PRESS).
- Annunciator C-C-1 (RCP 1C CC RETURN LO FLOW).
- Annunciator C-C-5 (RCP 1C SEAL WATER RETURN LO d-PRESS).
- Annunciator C-D-4 (RCP 1A SEAL LEAKOFF LO FLOW).
- Annunciator C-E-4 (RCP 1B SEAL LEAKOFF LO FLOW).
- Annunciator C-E-8 (PRZ LO LEVEL HTRS OFF & LETDOWN ISOLATION).
- Annunciator C-F-4 (RCP 1C SEAL LEAKOFF LO FLOW).
- Annunciator C-G-1 (PRZ NDT OVERPRESS SYSTEM REQ'D).
- Annunciator C-G-8 (PRZ SURGE LINE LO TEMP).
- Annunciator E-A-1 (HI-HI CONT PRESS CLS CH-1).
- Annunciator E-A-4 (RX COOL LOOP 1C LOW FLOW CH-1).
- Annunciator E-B-1 (HI-HI CONT PRESS CLS CH-2).
- Annunciator E-B-9 (CONT HI PRESS).
- Annunciator E-C-1 (HI-HI CONT PRESS CLS CH-3).
- Annunciator E-C-4 (RX COOL LOOP 1C LOW FLOW CH-3).
- Annunciator E-D-1 (HI-HI CONT PRESS CLS CH-4).
- Annunciator E-D-4 (RX COOL LOOP 1C LOW FLOW CH-2).
- Annunciator E-E-2 (HI CONT PRESS CLS CH-1).
- Annunciator E-F-1 (HI CONT PRESS CLS CH-2).
- Annunciator E-F-7 (PRZ LO PRESS SI CH-1).
- Annunciator E-G-1 (HI CONT PRESS CLS CH-3).
- Annunciator E-G-7 (PRZ LO PRESS SI CH-2).
- Annunciator E-H-1 (HI CONT PRESS CLS CH-4).
- Annunciator E-H-7 (PRZ LO PRESS SI CH-3).
- Annunciator G-B-1 (APPROACH TO SATURATION TEMP ALARM).
- Annunciator H-A-8 (STM LINE ISO TRIP VLVS CLOSED).
- Annunciator VSP-C-2 (AUX VENT SYSTEM SAFETY MODE INITIATED).
- Annunciator VSP-J-2 (UNIT 1 AUTO START BLOCK).
- 1201 - Secure 1-RC-P-1C.
- RVLIS Dynamic Head indication goes off-scale low.
- RVLIS Full Range indication on-scale bouncing between 96 and 105%.
- RVLIS Upper Range indication on-scale bouncing between 79 and 113%.
- 1205 - Transition made to EP-2.00, Loss of Reactor or Secondary Coolant.
- 1210 - Containment pressure restored to subatmospheric.
- Annunciator B-D-4 (CLS TRAIN A RESET PERMISSIBLE).
- Annunciator B-D-5 (CLS TRAIN B RESET PERMISSIBLE).
- 1214 - Containment Total pressure 10.0 psia.
- Containment Partial Pressure 9.00 psia.
- Reset Consequence Limiting Safeguards signals.
- Secure 1-RS-P-2B.
- Annunciator A-H-8 (RECIRC SPRAY PP 2B LOCKOUT OR OL TRIP).
- 1215 - High Head Safety Injection realigned to redundant flowpaths in accordance with EP-2.00, Loss of Reactor or Secondary Coolant.

TIMEEVENT

- 1216 - Annunciator J-F-6 (TURB GEAR ZERO SPEED).
- 1220 - SITE AREA EMERGENCY declared (Tab B-2) based on RCS leak rate exceeding makeup capability or (Tab D-2) based on high Containment radiation, pressure and temperature.
- 1235 - Annunciator VSP-B-5 (#3 EMER DIESEL GEN TROUBLE).
- Operator dispatched to check #3 EDG local panel indications.
- 1236 - Annunciator A-A-7 (RWST TANK LOW LEVEL).
- 1237 - RWST level at 19% causes SI system realignment to Recirc Mode.
- Annunciator A-D-4 (SI VLVS OUT OF POSITION).
- Transition to EP-2.03, Transfer to Cold Leg Recirculation.
- 1300 - 1-SI-P-1A develops a seal leak of approximately 50 gpm.
- 1310 - Low Head SI pump, 1-SI-P-1A, trips.
- Annunciator A-G-4 (LO HD SI PP 1A LOCKOUT OR OL TRIP).
- High-Head Safety Injection Pump amp indications begin fluctuating.
- 1311 - 1-CH-P-1B secured in order to stop HHSI pump cavitation.
- 1-CH-P-1A amp indication steady at normal amperage reading.
- 1315 - MOV-1864A breaker thermals when closure attempt made.
- Operator dispatched to reset MOV-1864A breaker (LH1-2101).
- 1320 - MOV-1864A breaker fails when operator resets thermal overload.
- 1330 - GENERAL EMERGENCY declared (Tab B-10) based on breaching all three fission product barriers or (Tab E-1) based on actual or projected Site Boundary Doses of 2 R W.B. or 12 R Thyroid.
- 1345 - 1-RS-P-2A, "A" Outside Recirculation Spray Pump, loses indicating lights due to a blown control power fuse.
- 1400 - FI-1496, "B" LHSI discharge flow, power supply module fails.
- FI-1496 indication goes to 0 gpm.
- 1430 - MOV-1864A breaker repaired.
- MOV-1864 closed, release terminated.
- 1700 - Terminate emergency on-site, commence area critiques.
- 1730 - Commence recovery planning phase.
- 1800 - Terminate exercise on-site.
- 1900 - Terminate exercise off-site.