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NUCLEAR REGULATORY COMMISSION
REGION II
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Report Nos.: 50-280/91-25 and 50-281/91-25

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: August 26 - 30, 1991

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Radiological Protection and Emergency
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SUMMARY

Scope:

This routine, announced inspection involved the observation and evaluation of the annual emergency preparedness exercise. Emergency organization activation and response were selectively observed in the Simulator Control Room (SCR), Technical Support Center (TSC), Operational Support Center (OSC), and Local Emergency Operations Facility (LEOF). The inspection also included a review of the exercise scenario and observation of the licensee's post exercise critique. This exercise was held in conjunction with an ingestion pathway exercise which included emergency response demonstrations by the Commonwealth of Virginia and several local governments.

In the areas inspected, violations or deviations were not identified. Licensee performance as observed was timely and sufficient to mitigate offsite consequences of the simulated accident. Demonstrated program strengths included: good emergency response command and control; prompt activation of emergency facilities; timely event

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classification, declarations, and initial notifications; high levels of staff proficiency, evidence of strong training; good response to assess and mitigate plant damage; good transition from the primary operational support center to it's backup facility; a lead controller communications network that provided efficient exercise control; and effective management of damage control teams. An area needing additional management attention concerned Radiological Control Area (RCA) access process timeliness during emergency conditions.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. Allen, Emergency Operations Director
*W. Benthall, Nuclear Safety and Licensing
*M. Biron, Alternate Radiological Assessment Director
R. Blount II, Emergency Procedures Coordinator
*M. Bowling, Licensing Manager
*D. Christian, Site Emergency Manager
*J. Collins, Drill Manager
*J. Costello, Emergency Preparedness
*J. Curling, Security Lead Controller
*J. Downs, Outage and Planning Superintendent
*D. Erickson, Radiological Assessment Director
*A. Fletcher, Design Supervisor
*A. Friedman, Nuclear Training Superintendent
*R. Gwalthney, Maintenance Superintendent
M. Haduck, Emergency Maintenance Director
*S. Harrison, TSC Lead Observer
*R. Lee, Corporate Nuclear Engineering
*J. Lusher, TSC Lead Controller
*W. Madison, Lead Controller
*G. Marshall, Operations
*A. Meekings, Administrative Services Supervisor
*W. Neidermeyer, Simulator Lead Controller
*J. Ogren, OSC Lead Controller
*J. Price, Assistant Station Manager
*R. Saunders, Alternate Recovery Manager
I. Seybold, Health Physics Lead Observer
K. Sloane, Alternate Emergency Operations Director
*D. Snoody, OSC Director
*T. Sowers, Emergency Technical Director
A. Wheeler, Simulator Control Room Shift Supervisor
*S. Wood, Training
R. Yizzi, Simulator Control Room Senior Reactor Operator

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

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's Emergency Plan 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. The scenario was adequate to exercise fully the onsite and offsite emergency organizations of the licensee and provide sufficient emergency information to the State and local government agencies for their participation in the exercise.

The licensee's controller communication network was effective and enabled all lead controllers to be aware of current activities in each of the other emergency facilities. The communication system was an effective scenario tool that was utilized to keep the scenario moving as planned.

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 have been specifically established and that adequate staff was available to respond to an emergency as required by 10 CFR 50.47(b)(1), 10 CFR 50, Appendix E, Paragraph IV.A, and specified criteria in NUREG-0654, Section II.A.

The inspector observed that specific emergency assignments and responsibilities were made for the licensee's onsite emergency response organization, and that adequate staff was available to respond to the simulated emergency. It should be noted that a transportation accident involving radioactive material in route from the licensee's facility to a vendor occurred during the exercise. Licensee response to that accident created additional demands on key emergency personnel including the various emergency directors. However, the alternates performed well throughout the organization, indicating good organizational planning and training.

No violations or deviations were identified.

4. Onsite Emergency Organization (82301)

The licensee's on-shift emergency organization was observed to determine that the responsibilities for emergency response were unambiguously defined, that adequate staffing was provided to insure initial facility accident response in key functional areas at all times, and that the interfaces were specified as required by 10 CFR 50.47(b)(2), 10 CFR 50, Appendix E, Paragraph IV.A, and specific criteria in NUREG-0654, Section II.B.

The inspector observed that the initial on-shift emergency organization was well defined; the responsibility and authority for directing actions necessary to respond to the emergency were clear; and that staff were available to fill key functional positions within the organization.

The inspector observed the activation, staffing, and operation of the emergency organizations in the SCR, TSC, OSC, and LEOF. The licensee was able to staff and activate the above Emergency Response Facilities (ERFs) within approximately 30 minutes.

The initial response organization was augmented by designated licensee representatives on-shift. Because of the scenario scope and conditions, long term or continuous staffing of the emergency response organization was not required.

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.

Emergency Plan Implementing Procedures (EPIP)-1.01, Emergency Action Level Table, provided for off-normal events to be classified into one of the four emergency classification categories. The designated Station Emergency Manager (SEM) in the SCR promptly and correctly used the procedure to identify and classify the Notification of Unusual Event and the Alert as did the SEM in the TSC to classify the Site Area Emergency and General Emergency.

No violations or deviations were identified.

6. Notification Methods and Procedures (82301)

This area was observed to assure that procedures were established for notification of State and local response organizations and emergency personnel by the licensee, and that the content of initial and followup messages to response organizations was established. This area was further observed to assure that means to provide early notification to the population within the plume exposure pathway were established pursuant to 10 CFR 50.47(b)(5), Paragraph IV.D of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.E of NUREG-0654.

Notifications to offsite authorities were established in EPIP-2.01, Notification of State and Local Governments, and EPIP-2.02, Notification of NRC. The inspector observed that notification methods and procedures were used promptly to provide information concerning the simulated emergency conditions to Federal, State, and local response organizations and to alert the licensee's augmented emergency response organization.

Notifications of the Commonwealth of Virginia and local offsite organizations were completed within the 15 minutes following the classification and declaration of the emergency event.

The Early Warning System, consisting of sirens located throughout the 10 mile Emergency Planning Zone (EPZ) that can be used to alert the public within the EPZ, was not activated during the exercise due to a concern that the public may be confused over appropriate response given the ongoing transportation accident.

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 specific criteria in NUREG-0654, Section II.F.

The inspector observed that adequate communications existed among the licensee's emergency organizations, and between the licensee's emergency response organization and offsite authorities.

No violations or deviations were identified.

8. 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 key Emergency Response Facilities (ERFs), including the SCR, TSC, OSC, and LEOF. In addition, the inspector observed the emergency medical drill.

a. Emergency Medical Drill

This area was observed to determine whether first aid to a potentially contaminated injured individual is effectively provided and to assure appropriate actions are taken to transport the worker to the offsite hospital.

An inspector observed the response of the first aid and HP team to the simulated contaminated injured worker. Efforts were properly directed to the life-threatening injury.

Contamination monitoring and control were provided, but in a manner not to impede the first aid treatment. The simulated contaminated injured worker was transported to an offsite hospital in the licensee's emergency vehicle. The licensee observer noted several areas for improved coordination between the first aid and Health Physics (HP) response staff.

The licensee's handling of the simulated contaminated injured worker was effective.

No violations or deviations were identified.

b. Simulator Control Room

The Shift Supervisor (SS) demonstrated excellent command and control throughout the exercise and classifications and notifications were accomplished efficiently and in a timely manner. Both reactor operators and supervisors demonstrated good use of the normal, abnormal, emergency operating procedures, and the EPIPs throughout the exercise. The operations staff worked extremely well as a team. The turnover briefing from the SS to the SEM was effective.

There were some minor communication problems in the SCR that were identified by the licensee. However these problems did not impede the exercise time line. They included:

- The GaiTronics announcing system in the SCR was difficult to hear and required the operators on several occasions to request information/report repeat backs on other communication sources.

- The SS did not inform Security that the injured man was contaminated even though he spoke to Security three times after he was aware of the contamination problem. The three calls included requesting outside assistance and an ambulance and requests for status reports on the ambulance.

- At time 0952, the SS received data confirming an Operation Basis Earthquake had occurred. The SS then spent nine minutes discussing the data with the Senior Reactor Operator before he declared an Alert at time 1001. When he did declare the Alert he declared it as of 0952.

There were some access problems for operations personnel attempting to enter the RCA during the emergency exercise. These included:

- At 1218 the Loss Of Coolant Accident occurred requiring the operators to enter Emergency Procedure 1-E-0. Immediate action Step 12 of 1-E-0 requires valve 1-CW-117 to be opened locally. According to a plant safety analysis conducted by the Nuclear Analysis and Fuel Group, valve CW-117 was required to be opened within 29 minutes from Safety Injection (SI) initiation. The operator directed to open CW-117 was delayed 33 minutes at HP checkpoint prior to entering the RCA.

- During the controller critique, it was also identified that an operator directed to investigate the "Boric Acid Flats" was delayed 42 minutes at HP checkpoint prior to entering the RCA. Discussion with the facility controller indicated the operator left the annex at 0911 and reached the "Boric Acid Flats" one hour later at 1011. Several factors contributed to the delay including:

  - HP discussion on dress out requirements,
  - Waiting for the results of air samples,
  - The operator became contaminated (simulated) when he entered a contaminated area that had not been identified, and
  - The operator waited for AP-37 inspection forms.

Licensee representatives reported that operations personnel were processed into the RCA as normal damage control personnel and did not receive any emergency prioritization.

Inability to dispatch operations personnel in a timely manner and process them through radiation protection program access requirements for entry into the RCA during emergency conditions in a timely manner is an NRC concern when delayed operator actions may affect the safety of the reactor. Therefore, corrective action for this problem area will be carefully examined during the next exercise. The inspector indicated to the licensee that this area will be tracked as an Inspector Followup Item (IFI) (50-280/91-25-01: RCA Access Timeliness For Operators and Damage Control Teams During Emergency Conditions).

No violations or deviations were identified.

c. Technical Support Center

The TSC was activated and staffed promptly upon notification by the SEM of the Alert classification. The facility layout provided for a good interface between the SEM and his Emergency Directors. Command and control in the TSC was good specifically considering a majority of the TSC directors

were alternates. TSC status boards were kept current and the information provided was used to facilitate decision making. Technical assessment and mitigation activities were aggressively and properly pursued by the technical, maintenance and operations staffs.

The following communication problems were observed by the inspector.

- During the first 15 minutes after TSC activation it was difficult to carry on voice conversation in the TSC because of elevated noise levels partly due to extensive GaiTronics system administrative announcements. The SEM directed an announcement be made restricting use of GaiTronics for drill comments and emergency announcements only.

- The SEM thought the Alert had been declared at 0930. He had 0930 written in this turnover information and this is the time of declaration he announced when he conducted his initial TSC staff briefing. Although the Emergency Operations Director (EOD) and the EPC had recorded the correct Alert declaration time as 0952 they did not correct the SEM.

- Beginning approximately one hour after TSC activation one or two of the TSC directors were not attentive to the SEM's periodic staff update briefings.

- At time 1225, the SEM initially recommended Protective Action Recommendation (PAR) 3 to the Recovery Manager (RM) based on misinterpretation a block on the PAR matrix. Upon further discussion with the Radiological Assessment Director (RAD) and the Emergency Preparedness Coordinator (EPC) the error was noted and at time 1236 the correct PAR recommendation or PAR 2 was made to the RM.

The TSC facilities were well equipped and organized to support simulated plant emergency conditions.

No violations or deviations were identified.

d. Operational Support Center

Activation of the OSC, which was located in the licensee's maintenance building, was initiated by the declaration of an Alert in accordance with EPIP 3.03, Activation of Operational Support Center. The inspector observed that, upon Alert declaration, personnel responded promptly to staff the facility. The OSC was declared activated with minimum staffing, within 10 minutes of the Alert

classification. The OSC Director promptly organized the staff and opened and maintained good communication with the TSC.

In accordance with the exercise scenario a earthquake caused damage to the maintenance building such that the OSC had to be evacuated and reestablished at it's alternate location. The alternate OSC was activated about 15 minutes after the primary OSC was damaged. The evacuation and relocation was made in an orderly fashion. The alternate OSC was located in the Unit 1 emergency switchgear room.

Several problems concerning the alternate OSC were noted by the inspector including the following:

- The majority of tools used by the craft were available at the primary OSC, however, following the move to the alternate OSC the OSC Director recognized that tools were no longer readily available. The OSC Director dispatched a team to the primary OSC to obtain some basic tools that may be needed. The inspector determined that EPIP 3.03 needed to address the availability tools at the alternative OSC.

- The OSC Director set up command in the area near the telephone. That area was not well lighted and did not have a work table or chair. There were also no tables or chairs for any of the staff needing to complete paperwork or read a procedure.

  Prior to moving to the alternate OSC facility, voice communication environment for all players and participants was good. The OSC Director's orders and instructions that were spoken in a normal voice could be heard by all participants in the immediate area. After moving to the alternate OSC the communication environment was significantly degraded due to the noise of operating equipment in the area. The Director's voice communication was reduced to a one on one basis. Hand held phone communications between the OSC Director and other participants was considered good. However, GaiTronics messages could not be heard at the alternate OSC phone location, where the Director was stationed.

- Routine verbal staff briefings were not possible because of the noise levels in the area and emergency status information was not posted in an area where most of the staff could see it.

The OSC Director and his staff maintained effective control of damage control teams dispatched out of the OSC. In addition to logs and various paperwork, a status board was used by the OSC Director to keep track of the location and status of damage control teams after they were dispatched from the alternate OSC for various work activities.

Observation, operation, and repair teams coordinated with the TSC and HP before dispatch to the RCA entry. At the RCA entry, teams were briefed on potential radiological conditions and protective measures. Radiological conditions were monitored by HP technicians who accompanied OSC teams. The coordination between damage control teams and HP was considered good, in that, no holdups were reported in this area for teams working out of the OSC.

The OSC was effective in providing support in response to simulated events. However, the alternative OSC facilities were poor.

No violations or deviations were identified.

e. Local Emergency Operations Facility

The LEOF was promptly staffed and activated with qualified personnel. The Interim Recovery Manager and RM provided timely and accurate status updates to the LEOF staff. Dose assessment personnel performed timely offsite dose calculations using computer models. The inspector also noted good command and control of the field monitoring teams. The teams were dispatched early from the site and were positioned at logical projected plume path monitoring points.

No violations or deviations were identified.

9. Accident Assessment (82301)

This area was observed to determine whether 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 simulated accident. During the exercise, the engineering accident assessment team functioned effectively in analyzing the plant status so as to make recommendations to the SEM concerning mitigating actions to reduce damage to plant equipment; to

prevent release of radioactive materials; and to terminate the emergency condition.

Onsite and offsite radiological monitoring teams were dispatched to determine the level of radioactivity in those areas within the influence of the simulated plume. The teams effectively demonstrated their capability to collect those data points and relay those data to the emergency response facilities.

No violations or deviations were identified.

10. 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.

The inspector verified that the licensee had and used emergency procedures for formulating PARs for offsite populations within the 10 mile EPZ. The RM in the LEOF provided timely and accurate PARs to Commonwealth of Virginia personnel. PARs were routinely reevaluated for accuracy and status updates were provided to the offsite authorities. Protective actions were initiated for onsite personnel following the Alert declaration by conducting a personnel accountability of those personnel inside the protected area. The site accountability process was achieved and reported within 30 minutes.

No violations or deviations were identified.

11. Exercise Critique (82301)

The licensee's critique of the emergency exercise was observed to determine whether shortcomings in the performance of the exercise were brought to the attention of management and documented for corrective action pursuant to 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Paragraph IV.E, and specific criteria in NUREG-0654, Section II.N.

The licensee conducted facility critiques with exercise players immediately following the exercise termination. Licensee controllers and observers conducted additional critiques prior to the formal critique to management on August 29, 1991. The critique process including the critique to management was well organized and thorough and included a review of the objectives that had been established for demonstration during the exercise. Issues identified during the exercise were thoroughly discussed by licensee representatives during the critique. Licensee action

on identified findings will be reviewed during subsequent NRC inspections. The licensee's critique addressed both substantive deficiencies and improvement areas. The conduct of the critique was consistent with the regulatory requirements and guidelines cited above and considered a program strength.

No violations or deviations were identified.

12. Previous Inspection Findings (92701)

(Closed) IFI 50-338/90-31-01: Failure to direct damage control teams in accordance with the procedures. The item is closed based on inspection team observations of, good management control of damage assessment teams and the performance demonstrated by the damage assessment teams.

13. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 29, 1991. The inspector summarized the scope and findings of the inspection including the IFI. Propriety information is not contained in this report. Dissenting comments were not received from the licensee.

Item Number	Description and Reference
50-280/91-25-01	IFI - Access Timeliness For Operators and Damage Control Teams Entering RCA During Emergency Conditions (Paragraph 8).

Attachments:
Exercise Objectives, Narrative Summary, and Time Line

VIRGINIA POWER

SURRY POWER STATION

AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

OBJECTIVES

VIRGINIA POWER
SURRY POWER STATION
AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

OBJECTIVES SUMMARY

The purpose of this exercise is to demonstrate the adequacy of the Surry Power Station Emergency Plan, the Corporate Emergency Response Plan, and associated implementing procedures.

The objectives of this Emergency 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. The event will include a simulated off-site radiological release and ground deposition to support a combined plume and ingestion pathway exercise.

The attached objectives, as numbered in the Virginia Power Nuclear Emergency Preparedness Six Year Plan, will be demonstrated as applicable to the schedule provisions of this plan.

As applicable to the events developed by the exercise scenario, the Surry Power Station and Corporate Emergency Response Facilities (ERF) will be activated. Each ERF staff will demonstrate functions described in the implementing procedures. Emergency response functions which are impractical to demonstrate will be simulated.

A matrix is provided which indicates the objectives and the Virginia Power Emergency Response Facilities/Groups where they will be demonstrated. The Control Room Simulator will be used in lieu of the actual Station Control Room.

The following is a list of Corporate and Station Facilities and Groups with their names or acronyms:

(1) Control Room Simulator (CRS)
(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)
(8) Health Physics (HP)
(9) Security
(10) Chemistry

VIRGINIA POWER
SURRY POWER STATION
AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

OBJECTIVES

The following objectives establish the scope of the August 27, 28, and 29, 1991 Emergency Exercise. The objectives ensure that required events are included in the exercise scenario and establish appropriate exercise evaluation criteria.

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

   The CRS and TSC ERO will demonstrate this objective by initiation and use of EPIP-1.01 and appropriate operational procedures.

   Status forms detailing radiological monitor and operational data may be issued at periodic intervals to facilitate conduct of the scenario. The ability to acquire data using the Emergency Response Computer System (ERCS) or by back-up methods will be demonstrated in appropriate facilities.

2. Demonstrate the ability to notify, mobilize, and sustain the Surry Power Station and Corporate Emergency Response Organizations.

   The CRS staff, Station Security, and Corporate Security will notify and mobilize the Emergency Response Organizations. Station ERO notification will be conducted in accordance with the appropriate Station EPIP's. Corporate Security will initiate their Emergency Notification Procedure to call out the corporate ERO.

   Sustain continuous response capability will be demonstrated by the TSC, LEOF, CERC, and JPIC by formulating shift relief rosters. In addition, the process for obtaining logistical and technical support for the Emergency Response personnel may be demonstrated.

3. Demonstrate the ability to notify the state and local governments and the NRC within established time constraints.

   The CRS, TSC, and LEOF ERO will demonstrate this objective by providing up-to-date information to federal, state, and local governments within required time limits.

a. State and Local Government Notification

Information for these notifications will be identified and recorded by an 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) or the Recovery Manager (RM), the EC will transmit the information to the state and/or local governments.

The start time for completing the 15-minute initial notification will commence when the SEM declares the emergency classification. Follow-up communications will be maintained using EPIP-2.01, Attachment 1, and will occur at about 30 minute intervals or as conditions change.

As conditions warrant, the ability to transmit Protective Action Recommendations (PARs) to the State will be demonstrated in accordance with EPIP-1.05 and appropriate notification procedures.

The EC will transmit the initial Report of Radiological Conditions (EPIP-2.01, Attachment 2) to the state following data assimilation, recording, and approval. Follow-up notifications on radiological conditions will occur at about 30 minute intervals or as conditions change.

The SEM retains responsibility for state and local government notifications until the LEOF is activated. Following LEOF activation, responsibility for notification is transferred to the Recovery Manager (RM).

b. NRC Notification

Information for these notifications will be identified and recorded by the EC on EPIP-2.02, Attachment 1 (NRC Event Notification Worksheet), Attachment 2, (NRC Emergency Communicator Log), and EPIP-4.03, Attachment 1 (HPN Communications). Upon approval by the SEM, the ECs will transmit the information to the NRC.

The start time for completing the 1-hour initial notification commences when the SEM declares the emergency classification. The initial notification will be performed from the CRS. Following initial notification and unless directed otherwise, the EC will maintain continuous communications with NRC Operations to transmit plant condition changes. Communication dialogue highlights will be documented.

Responsibility for NRC Notifications in accordance with EPIP-2.02 will remain with the TSC ERO. Responsibility for Health Physics Network (HPN) communications will be transferred to the LEOF following activation of that facility.

4. Demonstrate the ability to conduct assembly and accountability of personnel within the Protected Area.

   The Station Security Staff will demonstrate this objective in accordance with EPIP-5.09 and EPIP-5.03. Also, to support the overall accountability process, the Assembly Area Leaders will perform area accountability in accordance with EPIP-5.03, Attachment 1 (Personnel Accountability).

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

   As appropriate, the CRS, TSC, and OSC staffs will demonstrate this objective by dispatching and controlling teams in response to scenario events within the Station Protected Area. Also, the ability to brief emergency teams and establish appropriate protective measures and communications will be demonstrated.

   Prior to Emergency Response Facility activation, the CRS staff will demonstrate this objective by initiating applicable procedures. Following facility activation, the TSC and OSC staffs will demonstrate this objective by implementing EPIP-3.02, EPIP-3.03, and EPIP-5.08.

6. Demonstrate the ability to assess conditions and implement appropriate protective measures for emergency response personnel, including site access control, contamination control, exposure control, use of protective devices and, as appropriate, the process for authorization of potassium iodide (KI) administration.

   This objective will be demonstrated through an interface among the CRS, TSC, and OSC ERO in which the TSC staff will monitor and authorize protective measures for site access, contamination control, and exposure control.

   The TSC organization, via the Radiation Protection Supervisor (RPS) located in the Health Physics area, will dispatch and direct monitoring teams within the bounds of the site property per EPIP-4.01 and EPIP-4.02 and associated procedures to assess radiological conditions. Protective measures appropriate for conditions will be developed and/or implemented for emergency response personnel.

   Security will implement access control measures in accordance with EPIP-5.09 and EPIP-5.04.

The OSC Staff and other site personnel will implement any necessary actions associated with protective equipment requirements and in-plant access control.

If necessary, in response to scenario events, the CRS and/or TSC and OSC staffs will demonstrate the process for requesting and authorizing exposure extensions, to include emergency exposure authorization in accordance with EPIP-4.01, EPIP-4.04, and EPIP-5.06. Also, if necessary, the TSC staff will demonstrate the KI authorization process per EPIP-4.01 and EPIP-5.07.

If necessary, in response to scenario events, the TSC will demonstrate the planning and notification processes for protective measures and evacuating non-essential personnel in accordance with EPIP-4.07 and EPIP-5.05.

7. Demonstrate the ability to develop appropriate Off-site Protective Action Recommendations (PARs) based on assessment of plant conditions and off-site dose projections and/or measurements.

   As appropriate, this objective will be demonstrated by the SEM from the TSC or by the RM in the LEOF. The TSC and LEOF organizations will monitor plant conditions and perform off-site dose projections to support formulation of PARs. Responsibility for PAR development is transferred to the LEOF following activation of that facility.

   Radiological parameter data generated during the development of this scenario may be artificially elevated and may not represent the degree of fuel failure and radiological release commensurate with the plant dynamic events. This may be necessary to demonstrate this exercise objective.

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

   As appropriate, this objective will be demonstrated by the TSC and LEOF staffs. The ability to perform initial dose assessment will be demonstrated through the implementation of EPIP-4.01 and associated dose assessment procedures.

   Field monitoring teams will be dispatched per EPIP-4.01, EPIP-4.02, and associated procedures to support the dose assessment effort. As appropriate, these teams will be directed by the RPS and/or the TSC and LEOF staffs.

9. As appropriate, demonstrate the ability of Health Physics and Chemistry to conduct radiological monitoring activities, including exposure rate surveys, 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. Post Accident Sampling activities may be performed in accordance with EPIP-4.22 and EPIP-4.23. The field monitoring teams will perform radiological monitoring activities in accordance with EPIP-4.03, EPIP-4.15 and EPIP-4.16.

Reactor coolant and/or containment samples may be obtained utilizing the High Radiation Sampling System (HRSS). Radiological data necessary to test response and monitoring capabilities will be provided by the controller during sample collection. Isotopic analysis data will be provided following demonstration of proper sample preparation and upon expiration of spectrum collection and analysis times.

10. Demonstrate the ability to effectively activate the emergency response facilities and associated emergency response processes.

    Activation of facilities and emergency processes by the TSC, OSC, LEOF, CERC, JPIC, and the LMC, will be demonstrated in accordance with the appropriate procedures.

    OSC evacuation and relocation will be demonstrated.

    As appropriate, activation of emergency processes will be demonstrated by Health Physics, Chemistry and Security.

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

    This objective will be demonstrated in the CRS, TSC, OSC, LEOF, CERC, JPIC, and LMC.

    In addition, Security, Health Physics and Chemistry facilities will demonstrate this objective.

12. Demonstrate the ability to establish and maintain effective communications.

    The CRS, TSC, OSC, LEOF, CERC, JPIC, LMC staffs, and Field Teams will demonstrate this objective.

    In addition, Security, Health Physics and Chemistry facilities will demonstrate this objective.

    Use of backup communications systems will only be demonstrated if primary communications fail.

13. Demonstrate the ability to maintain command and control of the emergency response effort.

The SEM will demonstrate on-site emergency response command and control from the CRS and TSC. The RM will demonstrate command and control of the emergency response effort associated with the LEOF upon activation of that facility.

The SEM will ensure personnel within the Protected Area are informed of emergency event status by the use of emergency alarms and the plant paging system (Gai-tronics). Remaining site personnel will be notified by other verbal communication methods. All announcements should be preceded and terminated with the phrase: "This is a drill."

The CRS, TSC, and LEOF ERO will demonstrate the ability to transfer appropriate command and control functions.

a. The CRS functions that will transfer to the TSC include:

   (1) Notifications to the state, local governments, and NRC.
   (2) Determining the emergency classification.
   (3) Authorizing emergency exposures.

b. The TSC functions that will transfer to the LEOF are:

   (1) Notifications to the state and local governments and to the NRC via the HPN.
   (2) Developing and transmitting PARs to the state.

14. Demonstrate the ability to coordinate preparation, review and release of timely and accurate information to the public.

The CERC, JPIC, LEOF, and LMC staffs will demonstrate this objective.

Press releases will be prepared and edited at the CERC and transmitted to the LEOF for technical review. Following approval by the RM and/or the Corporate Response Manager, the process for issuing press releases will be demonstrated.

The JPIC Director will be cognizant of all press releases and make them available to the media in the JPIC and LMC.

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

Public Affairs will demonstrate this objective by establishing an emergency hotline in accordance with CPIP-2.1. Questions will be called into the Public Information Room requiring response.

16. Demonstrate the ability to provide basic life support and to 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 victim's level of injury and by Radiological Protection employing the necessary radiological controls in accordance with EPIP-5.01 and EPIP-4.20 to remove the victim from the accident scene.

As necessary, Station Security will implement applicable sections of EPIP-5.01 to summons off-site support.

An off-site rescue unit will demonstrate the ability to respond to the station.

The contaminated injured person will be transported to an off-site facility.

17. Demonstrate the ability to respond to, control and mitigate the consequences of a fire.

This objective will not be demonstrated during this exercise.

18. Demonstrate the ability to establish a Recovery Organization and to develop a Recovery Plan.

This objective will be demonstrated by the SEM and RM by implementing EPIP-6.01 to develop both a Recovery Organization and Plan to return the Plant to a normal status.

19. Demonstrate the ability to conduct a self-critique and to identify areas for improvement.

The CRS, TSC, OSC, LEOF, CERC, JPIC, LMC, Security, Chemistry, and Health Physics will conduct a self-critique to identify weaknesses and improvement items.

SURRY POWER STATION

AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

OBJECTIVES DEMONSTRATION MATRIX

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CRS	X	X	X	X	X	X				X	X	X	X			X	*		X
OSC				X	X	X				X	X	X				X	*		X
TSC	X	X	X	X	X	X	X	X		X	X	X	X			X	*		X
LEOF		X	X				X	X		X	X	X	X	X			*	X	X
CERC		X								X	X	X		X		X	*		X
JPIC		X								X	X	X		X	X		*		X
LMC										X	X	X		X			*		X
SECURITY		X		X		X				X	X	X				X	*		X
HP				X	X	X			X	X	X	X				X	*		X
CHEMISTRY				X					X	X	X	X					*		X

* DENOTES NON-DEMONSTRATION

VIRGINIA POWER

SURRY POWER STATION

AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

NARRATIVE

VIRGINIA POWER
SURRY POWER STATION
AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

SCENARIO NARRATIVE

A full scale PLUME and INGESTION pathway exercise is scheduled to be conducted at the Surry Power Station on August 27, 28, and 29, 1991. For the purposes of the exercise, Unit 1 is designated as the affected unit.

Unit 1 is operating at 100 % full power equilibrium near end of life.

Unit 2 is operating at 100% full power equilibrium conditions with no equipment out of service.

The exercise initiates at 0830. At 0841 an individual is injured and contaminated in the Auxiliary Building. The necessity to transport the individual to an off-site facility requires the declaration of **Notification Of Unusual Event (NOUE).**

At 0931 an OBE earthquake occurs. This earthquake is greater than OBE levels which requires the declaration of an **Alert.**

At 1032 another earthquake occurs which is smaller in magnitude than an OBE earthquake. One minute later a loose parts alarm is received. Then a ten (10) gpm Reactor Coolant System leak begins and applicable radiation readings start to increase.

At 1117 a DBE earthquake occurs causing RCS leakage to increase to 400 gpm. The reactor and turbine trip also safety injection commences with phase "1" isolation. In addition the loss of the 1J1 480v bus occurs. The RCS leak and/or the earthquake necessitates the declaration of a **Site Area Emergency.**

A major LOCA occurs at 1218, containment pressure increases and CLS is initiated. At initiation of CLS containment spray pump, 1-CS-P-1A, trips. Then high containment pressure causes a penetration failure allowing an atmospheric release into the Aux Building and to the environs through the Ventilation Vent system.

A **General Emergency** is declared based on the loss of three (3) fission product barriers, as indicated by the release and/or actual or projected site boundary doses exceeding 2 Rem whole body or 12 Rem thyroid.

The escalation through the applicable emergency classifications will provide activities designed to exercise both on-site and off-site response organizations. Sufficient time will be permitted to allow the response organizations to perform the required assessment and appropriate response actions.

The release will terminate when the applicable repairs are made to the spray systems and the containment is sprayed down to sub-atmospheric conditions.

On-site Recovery meeting will commence.

Day 1 activities will terminate and area critiques will follow after which Day 1 is completed.

Day 2 activities will commence at 0830. Off-site recovery planning will commence. Sampling data will be provided to support the process of establishing the environmental sample plan. Other activities include : initiating the environmental sample plan and updating the sampling plan.

Day 3 activities will commence at 0800. Cohesive analysis results will be provided of the plan promulgated on Day 2. Other Day 3 activities include : revising the sample plan ,as necessary, updating protective action recommendations, responses being implemented by ingestion local governments, field sampling, analyzing samples, "Hot Spots" being discovered, recovery and re-entry commencing off-site.

Area critiques are scheduled to commence at 1700, and Day 3 activities are to be completed at 1800.

Virginia will provide services, as requested, by the Commonwealth of Virginia to support the activities of the ingestion pathway scenario.

VIRGINIA POWER

SURRY POWER STATION

AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

TIME LINE

VIRGINIA POWER
SURRY POWER STATION
AUGUST 27, 28, AND 29, 1991 EMERGENCY EXERCISE

TIME LINE

NOTE: TIMES ARE APPROXIMATE

TIME	EVENT
DAY 1	
0800 -	Lead Controllers and Lead Observers positioned.
-	Operations Department participants positioned in the Control Room Simulator.
-	Selected controllers perform necessary participant briefings.
0830 -	Simulator run started.
0841 -	An individual is contaminated and injured performing maintenance in the Aux Building.
0910 -	**NOUE** (Tab F-1), declared due to the transportation of a contaminated injured person to an off-site facility.
0931 -	OBE earthquake occurs (0.09g horizontal motion).
-	Strong motion accelerograph alarm.
0951 -	**ALERT** (Tab L-2) declared due to earthquake greater than OBE levels.
1032 -	Minor earthquake occurs (0.06g horizontal motion).
-	Strong motion accelerograph alarm.
-	Loose parts alarm is received for the lower vessel.
-	Letdown radiation levels start to increase.
-	RCS leak of approximately 10 gpm begins.
1033 -	Hi - Hi Letdown Radiation Monitor Alarm is received.
1034 -	Letdown reading indicates off scale high.
1059 -	Unit starting to be ramped off the line.

1117 - Earthquake greater than DBE level (0.2g horizontal motion).

- Strong motion accelerograph alarm.

- Loss of 1J 480v bus.

- RCS leak increases to 400 gpm.

- Instrument failure causing loss of steam dumps.

- Damage to the Maintenance Building.

1120 - Reactor and turbine trips.

1121 - Safety Injection and Phase "1" isolation occur.

1134 - Source Range energizes.

1137 - **SITE AREA EMERGENCY** declared based on (Tab L-1) earthquake greater than DBE level and/or (Tab B-2), RCS leak rate exceeding makeup capacity of operating charging/SI pumps as indicated by pressurizer level.

1218 - LOCA occurs on "C" RC Loop Hot Leg.

- HI HI CLS is initiated.

- 1-CS-P-1A starts, however there is no flow due to impeller malfunction.

- The following pumps will trip upon auto or manual start: 1-RS-P-2A, 1-RS-P-1A.

- High containment pressure causes penetration failure, release commences into the Auxiliary Building.

- Release commences to atmosphere through the Ventilation Vent system.

1238 - **GENERAL EMERGENCY** declared due to (Tab B-10), the loss of 2 of 3 fission product barriers with potential loss of 3rd barrier and/or (Tab E-1), projected or actual site boundary dose exceeding 2 Rem whole body or 12 Rem thyroid.

1445 - Repairs are such that a portion of the containment spray or recirc spray systems are back in service to reduce containment pressure to sub-atmospheric.

- **NOTE : INFORM THE LEAD CONTROLLER PRIOR TO EQUIPMENT BEING BROUGHT BACK INTO SERVICE, SO PROPER COORDINATION IS ACHIEVED.**

1515 - Terminate emergency on-site, restore Emergency Response Facilities.

1530 - Start On-site Recovery Meeting.

1600 - Commence Area Critiques for all participants except those in Recovery

1630 - Complete On-site Recovery Meeting, start Area Critique for Recovery Staff.

1730 - Area critiques complete, participants break until Day 2.

DAY 2

0830 - Controllers and Observers are positioned.

0900 - Ingestion pathway exercise participants are positioned. Participants brief, as necessary.

1000 - Commence off-site recovery planning.

The following are anticipated actions for Day 2

- Receive AMS scanning flyover data (Gross activity footprint).
- Establish Environmental Sampling Plan to refine/characterize off-site plume deposition footprint.
- Update and revise sampling plan, as necessary, when receiving key sample results through out day 2 activities.

1400 - Terminate Day 2 activities.

DAY 3

0800 - Controllers and observers are positioned.

0830 - Controllers brief participants on plant and off-site conditions.

- Controllers provide participants the comprehensive analysis results of the SAMPLE PLAN performed on **DAY 2.**

0900 - The following are anticipated actions for Day 3

- Laboratory samples analyzed.
- Field sampling completed.
- CLS reports sample analyses results to Bureau of Radiological Health.
- Bureau of Radiological Health redefines Environmental Sampling Plan.

- Protective Actions recommended for Ingestion Pathway.

- Selective re-entry begins in risk area local governments.

- Ingestion local governments (Coordinator, PIO's, Extension Agents, Communication Centers) respond in accordance with plan and scenario messages.

- Hot Spots discovered in evacuated/sheltered areas.

- Environmental Sampling Plan revised.

- Relocation considered for "Hot Spots" areas: Recovery begins off-site.

1700 - Recovery terminates off-site, commence area critiques.

1800 - Exercise terminates off-site.

INSPECTOR'S REPORT
Office of Inspection and Enforcement

Reviewer: W RANKIN

Inspectors: F. DWIGHT, W. RANKIN, S. [illegible]K, [illegible] FIFF, T. GUILFORD

Licensee Vendor: VEPCO, SURRY

Transaction type: 1 - INSERT (Y); 2 - MODIFY; 3 - DELETE; 4 - REPLACE

Docket No. (8 digits) or License No. (by product)	Report No.	Seq.	Next Inspec. Date Mo	Yr
50000280	9125			
50000281	9125			

Period of Investigation/Inspection: From 08 26 91 To 08 30 91

Inspection performed by: 1 - Regional Office Staff; 2 - Resident Inspector; 3 - Performance Appraisal Team; Other

Organization code of region/HQ conducting activity: 2 4 1

Regional Action: 1 - NRC Form 591; 2 - Regional Office Letter

Type of activity conducted: 01 - Safety; 02 - Incident; 03 - Enforcement; 04 - Mgmt. Audit; 05 - Mgmt. Visit; 06 - Special; 07 - Vendor; 08 - Mat. Acct.; 09 - Plant Sec.; 11 - Invent. Ver.; 12 - Shipment/Export; 13 - Import; 14 - Inquiry; 15 - Investigation

Inspection status of categories: A, B — 1 - Clear (checked); 2 - Violation; 3 - Deviation; 4 - Violation & Deviation

Total number of violations and deviations: A 0, B 0

Enforcement conference held: 1 - Yes

Report contains 2.790 information: 1 - Yes

Letter or report transmittal date: NRC Form 591 or Reg. Letter Issued; Report sent to HQ for action

Module Information

Type	Module Number	Percentage Completed To Date	Status
0	58[illegible]01	60 100	C
		60 100	C
0	58[illegible]03	6 100	C
		6 100	C

● Circle sequence # violation or deviation

OUTSTANDING ITEMS LIST (OIL)

CLOSEOUT FORM

DOCKET NO.(S): 50-280, 50-281

RESPONSIBLE INDIVIDUAL: FWRIGHT

FACILITY: SURRY

ITEM NUMBER	CLOSEOUT ACTION
90-31-01	91-025

SEE REVERSE FOR EXAMPLES