U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/94003(DRSS); 50-457/94003(DRSS)

Dockets No. 50-456; 50-457 Licenses No. NPF-72; NPF-77

Licensee: Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Braidwood Nuclear Generating Station, Units 1 and 2

Inspection At: Braidwood Site, Braceville, Illinois
Corporate Office, Downers Grove, Illinois

Inspection Conducted: March 2-4, 1994

Inspectors: J. Foster for — 3/21/94
T. Reidinger Date

J. Foster — 3/21/94
J. Foster Date

J. Foster for — 3/21/94
D. Shepard Date

Accompanying Personnel: K. Erickson
J. Bumgardner
J. O'Brien

Approved By: M. A Kunowski for — 3-21-94
J. W. McCormick-Barger, Chief Date
Radiological Programs Section 1

Inspection Summary

Inspection on March 2-4, 1994 (Reports No. 50-456/94003(DRSS); 50-457/94003(DRSS))
Areas Inspected: Routine, announced inspection of the Braidwood Station's emergency preparedness exercise involving review of the exercise scenario (IP 82302), and observations by six NRC representatives of key functions and locations during the exercise (IP 82301).

Results: No violations or deviations were identified; however, one weakness was identified in the Operational Support Center (OSC) due to the staff's failure to adequately demonstrate the ability to provide protective clothing or respirators for controlling radiological exposures or contamination for teams dispatched to obtain a gas sample from the plume. This weakness is discussed in Section 4.c. Exercise performances in the control room simulator and the Technical Support Center were very good. Exercise performances in the Emergency Operations Facility, the Operational Support Center, and the Corporate Emergency Operational Facility were good. Concerns identified regarding the staff's failure to inform the relevant emergency response facilities of the status of key decisions of the emergency response will be tracked as an Inspection Followup Item (Section 4.d). A concern was identified regarding the staff's failure to properly conduct radiological contamination control in the OSC and will be tracked as an Inspection Followup Item (Section 4.c). A concern was identified regarding the staff's failure to properly implement Emergency Operating Procedures (EOP's) and will be tracked as an Inspection Followup Item (Section 4.a).

DETAILS

1. NRC Observers and Areas Observed

D. Shepard, Control Room Simulator (CRS)
T. Reidinger, Operational Support Center (OSC)
J. Foster, Technical Support Center (TSC)
K. Erickson, Emergency Operations Facility (EOF)
J. O'Brien, Corporate Emergency Operations Facility (CEOF)
J. Bumgardner, Operational Support Center (OSC)

2. Persons Contacted

K. Kofron, Station Manager
D. Miller, Technical Services Superintendent
E. Roche, Health Physics Supervisor
K. Alshire, Emergency Planning (EP) Coordinator
S. Hess, EP Trainer
L. Holden, Corporate Onsite EP Supervisor
P. Sunderland, Lead Scenario Developer
J. Lewand, Regulatory Assurance
R. Flessner, Station Quality Verification (SQV) Director
S. Butler, Station Quality Verification (SQV) Inspector
K. Kaup, Production Superintendent

The personnel listed above attended the NRC exit interview on March 4, 1994.

The inspectors also contacted other licensee personnel during the inspection.

3. General Observations

An announced, daytime exercise of the licensee's Generating Stations Emergency Plan (GSEP) was conducted at Braidwood Station on March 2, 1994. The exercise tested the licensee emergency response organization's capabilities to respond to an accident scenario resulting in a simulated release of radioactive effluent. Attachment 1 describes the scope and objectives of the exercise. Attachment 2 summarizes the exercise scenario.

The licensee's response was coordinated, orderly, and timely. The exercise demonstrated that the licensee's emergency plan and associated procedures were adequate. The licensee demonstrated that it was capable of implementing these plans and procedures.

4. Specific Observations (IP 82301)

a. Control Room Simulator

Overall CRS performance was very good.

The acting Station Director's initial public address announcement stated that all designated TSC Directors should report to the TSC and OSC Directors should report to the OSC. Although the procedure governing activation of the OSC and TSC does not require additional information to be passed, it could be helpful to include the current emergency classification and the basis for the classification. This could alleviate phone requests for additional status impacting the control room.

Management and control of the CRS was excellent. The Shift Engineer (SE) kept his staff informed and focused on priority tasks. Briefings were frequent, well organized and ensured that all the operators were kept informed of the emergency classifications, priority tasks, and plant status as plant conditions changed. The SE requested and accepted input from all the operators.

The CRS staff was proactive in identifying degraded plant conditions, attempting to correct the equipment malfunctions, and mitigating the accident. For example, the CRS staff successfully lined up a Refueling Water Storage Tank flow path to the reactor vessel via the Residual Heat Removal system when primary system pressure was low.

Event detection and classification by the CRS staff was good. They correctly declared the Alert based on emergency action level (EAL) MA1 (power to ESF buses reduced to a single source for greater than or equal to 15 minutes).

Communications to and from the CRS were excellent. Dedicated communicators arrived promptly in the CRS to support offsite notifications. Notifications were performed within the regulatory time requirements. The CRS staff was excellent in updating and responding to the State inquiries.

Abnormal and emergency procedural usage was excellent with one exception. While in emergency operating procedure, ECA 0.0, "Loss of All AC Power," the CRS staff incorrectly transitioned in the procedure which delayed energizing either the Containment Spray Pumps (CSPs) or Reactor Containment Fan Coolers (RCFCs) after bus power was available. As a result, the duration of the offsite release was extended for approximately one hour. Starting this equipment sooner would have initially reduced containment pressure thereby reducing the magnitude of the offsite release through the leaking containment equipment hatch seal.

The failure to properly implement Emergency Operating Procedures (EOP's) will be tracked as a Inspection Followup Item (No. 50-456/94003-01(DRSS); 50-457/94003-01(DRSS)).

No violations or deviations were identified.

b. Technical Support Center

Overall TSC performance was very good.

Personnel began arriving at the TSC, without being pre-staged, shortly following the initial plant public address announcement. TSC personnel promptly began assuming their tasks, activating equipment, reviewing procedural checklists, and establishing communications. Additionally, the simulated Emergency Response Data System (ERDS) was activated in the TSC.

The Station Director and key staff held excellent periodic staff briefings. Overall command and control in the TSC was excellent. Briefings were held approximately each hour, or when appropriate due to changing plant status. Briefings were thorough and well-detailed.

Logs of TSC activities were adequately maintained. Current forecasts of weather information were posted continually throughout the exercise. "Priority Board" usage for task priorities assigned to the OSC was excellent. This status board was frequently updated and priorities were revised as plant status changed. The Plant Parameter Trends bo[illegible] was not utilized, although plant parameters were available for many relevant parameter points even after loss of both Essential Safety Functions buses.

Environmental monitoring teams (EMTs) were promptly dispatched at the Alert declaration. TSC direction and communications with the field teams were outstanding. Teams were kept apprised of changing weather conditions, current emergency classification, and overall plant status. Radio checks between the EMTs and the EOF were coordinated prior to the EOF assuming EMT control.

A health physics technician with appropriate survey equipment monitored radiological habitability of the facility.

The EALs were continuously reviewed to determine whether an emergency classification change was warranted. Classifications were very proactive. At one point, the Station Director's decision for a General Emergency classification (based largely on declining plant status) was placed on "hold" by controllers to preserve the scenario timeline.

The Operations Director, Technical Director, and Maintenance Director maintained an excellent overview of plant conditions, providing the Station Director with recommendations for task priorities and response options. Dose assessment personnel in the TSC initiated onsite and offsite sampling and monitoring to confirm, assess, and track the release.

The Station Director initiated discussions with CEOF personnel regarding the CEOF status in assuming command and control from the TSC. The Station Director unrealistically expected the EOF to become operational in approximately 20 minutes, and concluded that having the CEOF assume command and control for a short time period would lead to confusion. In actuality, the EOF command and control transfer was accomplished approximately one hour later. However, the CEOF was not kept informed, in a timely manner, regarding the status of the transfer of command and control from the TSC to the EOF. The failure to inform the CEOF in a timely manner of the status of the command and control decision will be tracked as an Inspection Followup Item (Section 3.d).

Transfer of command and control to the CEOF was an option per the Generating Stations Emergency Plan. The potential for confusion was justified if assumption of command and control by the CEOF would be for a very short time period. The Manager of Emergency Operations (MEO) and Station Director discussions culminated in not having the CEOF assume command and control. However, considerations for CEOF assumption of command and control should have been anticipated when the expected time of EOF operational activation had elapsed. Subsequent discussions with the licensee resulted in the licensee committing to review CEOF command and control transfer procedures and including more specific criteria for allowing lead plant personnel to delay transfer of command and control.

The TSC's initial recovery plans were good and included items discussed in the recovery procedure. The plans and procedure addressed the need to evaluate root causes for the numerous equipment failures and the need to quarantine equipment for investigative purposes. However, the current Recovery/Reentry procedure did not address various needs which exist in the post-accident timeframe, i.e., a revised station organization, station liaison to the Federal Radiological Management and Analysis Center (FRMAC), and accident investigation by the NRC.

No violations or deviations were identified.

c. Operational Support Center

Overall performance by the OSC was very good.

Activation of the OSC was accomplished in an orderly and timely manner. The OSC Director was effective in directing resources to aid in the activation. He provided a good initial briefing and explained the basis of the emergency declaration.

Team dispatch from the OSC was timely. During activation, three teams were requested by the Shift Engineer. The OSC Director ensured that these initial teams and the subsequent OSC teams were provided with briefings and dispatched in a timely manner. When

resources constrained the requested activities, the OSC Director contacted the appropriate individuals in the TSC to assure the highest priority jobs were completed first.

Communications with and from the OSC were excellent. All significant plant parameters regarding the accident were transmitted to the OSC and posted on large sheets of paper for information. Communication with the inplant teams was very good.

The processing of the teams departing from and returning to the OSC was accomplished in an organized and expedient manner. All teams were closely tracked, with the personnel dispatched from the OSC clearly noted and promptly updated on the team tracking status board. Team briefing and debriefing were generally very good, with the exception of the radiological concerns discussed below.

10 CFR 50.47 (b) requires a means for controlling radiological exposures, in an emergency, for emergency workers. Two concerns were identified related to contamination control and respirator usage:

(1) Radiological conditions were not properly evaluated, and appropriate radiological protective equipment was not assigned for personnel dispatched from the OSC. On two occasions, no discussions were conducted in the OSC regarding precautions either to minimizing a team's uptake of radionuclides or controlling contamination prior to dispatching the team to investigate an unmonitored release through a leaking containment equipment hatch seal. No consideration was given regarding respirator usage for potential airborne contamination or the use of a portable survey meter for field contamination control or administrating Potassium Iodine (KI) tablets when a team was sent to obtain the requested gas grab sample and report survey results. The lack of protective equipment could have resulted in a significant internal exposure.

(2) Because of poor contamination control, when the first team returned from investigating the release and conducting an onsite survey in the plume area, portions of the Unit One and Unit Two trackways for a distance of approximately 150 feet were potentially contaminated. Several diesel repair technicians who crossed the potentially contaminated trackway to perform emergency repair work could have become contaminated prior to the contaminated area being posted.

The two above concerns above related to internal exposure control protection and contamination control are an Exercise Weakness (No. 50-456/94003-02(DRSS); 50-457/94003-02(DRSS)).

The radiological control point at the OSC entrance was not adequately maintained. A monitoring station was promptly set up when the OSC was being manned, but it was not effectively used. Deficiencies observed include:

- Personnel were observed to cross the stepoff pad without frisking, or bypass the monitoring station completely by using a unsecured door to the OSC.

- More than half of the personnel who were observed to frisk used frisk speeds and distances that would not have detected contamination had any been present, e.g., a team member was observed to perform a complete hand and foot frisk in 8 seconds.

- Generally, most of the personnel observed placed unmonitored hands, feet, or material over the stepoff pad prior to frisking.

Concerns regarding the staff's failure to properly conduct radiological contamination control at the OSC will be tracked as Inspection Followup Item (No. 50-456/94003-03(DRSS); 50-457/94003-03(DRSS)).

No violations or deviations were identified. One exercise weakness was identified.

d. Corporate Emergency Operations Facility

Overall performance by the CEOF staff was good.

The CEOF staff was preselected and pre-staged in a nearby conference room prior to activation. Therefore, the timeliness of the staffing was not demonstrated during this exercise.

After the Alert declaration, the CEOF staff activated the facility in an orderly manner. The Corporate Manager of Emergency Operations (CMEO) effectively managed his staff. The CMEO actively encouraged the staff to make recommendations and to forward any questions or concerns. The CEOF staff were kept well informed of plant status, associated equipment repair priorities, and other response actions. However, the CEOF was not kept informed, in a timely manner, regarding the status of key decisions made by the TSC or EOF, i.e., the transfer of command and control from the TSC to the EOF, the declaration of the General Emergency, and protective actions taken by the State. The staff's failure to inform the CEOF in a timely manner of the status of key decisions of the emergency response will be tracked as an Inspection Followup Item (No. 50-456/94003-04(DRSS); 50-457/94003-04(DRSS)).

Twenty minutes after the Site Area Emergency declaration, the CMEO informed the Station Director at the TSC that the CMEO was ready to assume command and control. The Station Director, in discussions with the CMEO, elected not to transfer command and control to the CEOF, as the EOF was expected to assume command and control in a approximately 20 minutes. Approximately one hour later, after the Site Area Emergency declaration, command and control was transferred to the EOF.

Since the CEOF did not assume command and control of the emergency response, the CEOF staff did not have responsibility for offsite notifications and, therefore, corrective actions associated with the exercise weakness related to offsite notifications identified at the CEOF during the 1993 exercise was not demonstrated.

The technical staff actively monitored the progression of the accident and emergency response efforts. Dose assessments were performed to estimate the source term from the field monitoring data. The CEOF staff reviewed the EALs and correctly identified the specific EAL which resulted in the Site Area Emergency declaration, i.e., EAL MS1 "Loss of Power to ESF Busses."

No violations or deviations were identified.

e. Emergency Operations Facility

Overall performance of the EOF was good.

The EOF staff were preselected and pre-staged in Morris (within 10 miles of the Mazon EOF), and were released from the pre-staging area on a staggered basis to simulate a normal EOF arrival. Supervisory personnel were the first to arrive, which might not be expected. The exercise did not adequately assess the licensee's ability to adequately staff the EOF in a realistic manner.

The EOF's Manager of Emergency Operations (MEO) assumption of command and control occurred before the correct declaration of the General Emergency (GE) which caused temporary confusion in the EOF, i.e., the MEO did not make any announcement in the EOF stating who was in charge. Additionally, after the GE was announced in the EOF, no one was directed to inform the other emergency facilities. The CRS, TSC, and OSC were not notified about the GE declaration for another 20 minutes.

The failure to inform all emergency response organizations in a timely manner of the GE declaration will be tracked as an Inspection Followup Item (Section 3.d).

The EOF staff issued the Nuclear Accident Reporting System (NARS) and State Accident Update Checklist (SAUC) forms in a timely manner. However, the NARS form with the GE declaration was issued without the MEO's approval. Since the State had already

implemented Protective Action Recommendations (PARs) in excess of what the EOF staff were going to recommend, the PARs on the NARS form reflected the State's PAR's.

Plant status boards were updated promptly, and the method of displaying information was very observable to the staff. The Technical Support Director and other key directors gave detailed briefings to the EOF staff with an acceptable frequency and after major events or decisions were made.

The EOF technical groups were not coordinated in providing assistance when responding to technical issues, i.e., the Station SRO could not diagnose the primary Loss of Coolant Accident (LOCA) and the control room had to complete the LOCA diagnosis. There was early confusion regarding core damage and whether a steam generator tube leak existed. The suspected tube leak prompted the State to escalate the PARs that were implemented.

No violations or deviations were identified.

5. Exercise Objectives and Scenario Review (IP 82302)

The exercise scope and objectives and the exercise scenario were submitted to NRC within the proper timeframes. The licensee adequately responded to the lead inspector's questions pertaining to the scenario. However, it is noted that the licensee's performance to satisfy some objectives were judged as marginal, i.e.,:

OSC

- Ability to collect, document, and use radiological surveys (Objective 3a).
- Ability to evaluate radiological conditions for scenario conditions (Objective 3b).
- Ability to provide appropriate radiological protection for onsite personnel (Objective 3c).
- Ability to establish and maintain Emergency Response Facility radiological controls (Objective 3g).

EOF

- Use of NARs and SAUC forms (Objective 2a).
- Transfer of data and event classification to in-plant facilities (Objective 4j).

No violations or deviations were identified.

6. Exercise Control

The control of the scenario resulted in problems with conduct of the exercise. Some problems noted in the CRS were that the 1B Emergency Diesel Generator could not be paralleled to the vital bus, and DC ground annunciators were received after bus 142 was reenergized.

Some data in the exercise scenario was incorrect.

- A dose rate of 60 millirem/hour (0.6 milliSievert/hour) was reported at the MSIVs at a point when no core damage had occurred and the reactor was shut down. This led to confusion in the CRS as the operators were looking for a Steam Generator Tube Rupture when one did not exist.

- The RCS hot leg and cold leg temperatures were given on the plant status message sheets as dropping from about 600 degrees F with the core covered, to 207 and 265 degrees F when the core uncovered. Temperatures expected under these conditions with the upper part of the core being cooled by steam would be well in excess of 600, and probably in excess of 1000 degrees F.

No violations or deviations were identified.

7. Exercise Control and Critiques (IP 82301)

Exercise control was very good. There were adequate controllers to control the exercise. No noteworthy instances of controllers prompting participants to initiate actions, which they might not otherwise have taken, were observed.

The licensee's controllers held initial critiques in each facility with participants immediately following the exercise. These critiques were adequate. The licensee provided a summary of its preliminary strengths and weaknesses prior to the exit interview which were in strong agreement with the inspectors' preliminary findings.

8. Exit Interview

The inspectors held an exit interview on March 4, 1994, with the licensee representatives identified in Section 2 to present and discuss the preliminary inspection findings. The licensee indicated that none of the matters discussed were proprietary in nature.

Attachments:
1. Exercise Scope and Objectives
2. Exercise Scenario Summary

BRAIDWOOD NUCLEAR POWER STATION
1994 GSEP EXERCISE
SCOPE OF PARTICIPATION

STANDARD OBJECTIVES FOR EXERCISES Rev 3 (1/26/93)

PRIMARY OBJECTIVE:

Commonwealth Edison will demonstrate the ability to implement the Generating Stations Emergency Plan (GSEP) to provide for protection of the public health and safety in the event of a major accident at one of its Nuclear Power Stations.

SUPPORTING OBJECTIVES:

NOTE: An EOF designation includes all EOFs and the CEOF if activated as a Backup EOF. A CEOF designation is for activation of the CEOF as an initerim EOF only.

	Weight Factor	Raw Score	Weighted Score
** Denotes critical objectives			
1) Assessment and Classification			
a. Demonstrate the ability to assess conditions which warrant declaring a GSEP Classification within fifteen (15) minutes. - (CR, TSC, EOF, CEOF)	4	_____	_____
b. Demonstrate the ability to determine the highest Emergency Action Level (EAL) applicable for assessed conditions within fifteen (15) minutes. ** (CR, TSC, EOF, CEOF)	5	_____	_____
c. Demonstrate the ability to determine the most appropriate EAL(s) for assessed conditions within fifteen (15) minutes. - (CR, TSC, EOF, CEOF)	3	_____	_____
2) Notification and Communications			
a. Demonstrate the ability to correctly fill out the NARS form for conditions presented in the scenario. - (CR, TSC, EOF, CEOF)	4	_____	_____
b. Demonstrate the ability to notify appropriate State and local organizations within fifteen (15) minutes of an Emergency classification or significant changes in NARS information. ** (CR, TSC, EOF, CEOF)	5	_____	_____
c. Demonstrate the backup means of offsite notifications if the NARS network fails. ** (CR, TSC, EOF, CEOF)	5	_____	_____

	Weight Factor	Raw Score	Weighted Score
d. Demonstrate the ability to notify the NRC immediately after the State notifications and within one (1) hour of the Emergency classification using the Event Notification Worksheet as appropriate. - (CR, TSC, EOF)	4	____	____
e. Demonstrate the ability to provide information updates to the States at least hourly and within thirty (30) minutes of significant changes in conditions reported on the State Agency Update Checklist. - (CR, TSC, EOF, CEOF)	4	____	____
f. Demonstrate the ability to contact appropriate support organizations such as INPO, ANI, General Electric or Westinghouse, the Fuel Vendor, or Teledyne, for assistance during the Exercise. - (TSC, EOF)	1	____	____
g. Demonstrate the ability to maintain an open-line of communication with the NRC on the Emergency Notification System (ENS) upon request. - (CR, TSC, EOF)	3	____	____
h. Demonstrate the ability to maintain an open-line of communication with the NRC on the Health Physics Network (HPN) upon request. - (TSC, EOF)	3	____	____
i. Demonstrate the ability to provide information updates using the Event Notification Worksheet as appropriate to the NRC within thirty (30) minutes of changes in reportable conditions when an open-line of communication (ENS) is not maintained. - (CR, TSC, EOF)	3	____	____
3) <u>Radiological Assessment and Protective Actions</u>			
a. Demonstrate the ability to collect, document and use radiological surveys for conditions presented in the scenario. - (OSC)	3	____	____

	Weight Factor	Raw Score	Weighted Score
b. Demonstrate the ability to evaluate onsite radiological information for conditions presented in the scenario. - (TSC, OSC)	3	____	____
c. Demonstrate the ability to provide appropriate radiological protection (including clothing and respiratory equipment) for onsite personnel in accordance with procedures and policies. ** (TSC, OSC)	4	____	____
d. Demonstrate the ability to prepare and brief personnel for entry into a High Radiation Area in accordance with procedures and policies. - (OSC)	4	____	____
e. Demonstrate the ability to issue and administratively control dosimetry in the OSC in accordance with procedures and policies. - (OSC)	3	____	____
f. Demonstrate the ability to perform habitability surveys in the Emergency Response Facilities in accordance with procedures and policies. - (CR, TSC, OSC)	2	____	____
g. Demonstrate the ability to establish and maintain radiological controls in the Emergency Response Facilities in accordance with procedures and policies. - (CR, TSC, OSC)	3	____	____
h. Demonstrate the ability to control personnel exposure per 10CFR20 emergency exposure limits in accordance with procedures and policies. -(CR, TSC, EOF, CEOF)	4	____	____
i. Demonstrate the ability to monitor, track and document radiation exposure to inplant operations and maintenance teams in accordance with procedures and policies. - (TSC, OSC)	3	____	____

	Weight Factor	Raw Score	Weighted Score
k. Demonstrate the ability to identify appropriate Protective Action Recommendations (PARs) in accordance with procedures and policies within fifteen (15) minutes. ** (CR, TSC, EOF, CEOF)	5	____	____
l. Demonstrate the ability to determine the magnitude of the source term of a release. - (TSC, EOF, CEOF)	3	____	____
m. Demonstrate the ability to calculate Offsite Dose Projections in accordance with emergency procedures. - (TSC, EOF, CEOF)	4	____	____
o. Demonstrate the ability to obtain a meterological forecast. - (TSC, EOF, CEOF)	3	____	____
q. Demonstrate the ability to calculate release rate/projected doses with primary assessment instrumentation offscale or inoperable. - (TSC, EOF, CEOF)	3	____	____
r. Demonstrate the ability to collect and analyze RCS and Containment Atmosphere samples using High Radiation Sampling System equipment in accordance with HRSS procedures and health physics controls. - (CR, TSC, OSC)	3	____	____
s. Demonstrate the ability to estimate core damage in accordance with emergency procedures. - (TSC, EOF)	3	____	____
t. Demonstrate the ability of the Environs Director to initially brief the Field Teams and keep them aware of critical information. - (TSC, EOF)	3	____	____

	Weight Factor	Raw Score	Weighted Score
u. Demonstrate the ability to develop effective sampling strategy and effectively direct the Field Teams to assess the components of a radioactive release to the environment. - (TSC, EOF)	3	____	____
v. Demonstrate the ability to collect and count field samples in accordance with Environmental Sampling procedures. - (OSC/FIELD TEAMS)	3	____	____
w. Demonstrate the ability to document field samples in accordance with Environmental Sampling procedures. - (OSC/FIELD TEAMS)	3	____	____
x. Demonstrate the ability to perform dose rate measurements in the environment. - (OSC/FIELD TEAMS)	3	____	____
y. Demonstrate the ability to evaluate field sample results in accordance with procedures and policies. - (TSC, EOF)	3	____	____
z. Demonstrate the ability to dispatch the Field Teams within forty-five (45) minutes of determination of the need for field samples. - (TSC, OSC)	3	____	____
aa. Demonstrate the ability to monitor and direct Field Team activities in accordance with procedures and policies. - (TSC, EOF)	3	____	____
bb. Demonstrate the ability to monitor Field Team activities. - (CEOF)	3	____	____
cc. Demonstrate the ability to transfer control of Field Team activities in accordance with procedures and policies. - (TSC, EOF)	3	____	____
4. <u>Emergency Facilities</u>			
a. Demonstrate the ability to establish minimum staffing in the TSC and OSC within thirty (30) minutes of an Alert or higher Classification during a daytime event [within sixty (60) minutes of an Alert or higher Classification during an off hours event] in accordance with GSEP Section 4. ** (CR, TSC, OSC)	4	____	____

	Weight Factor	Raw Score	Weighted Score
d. Demonstrate the ability to augment the Control Room staff within thirty (30) minutes of an Alert or higher Emergency Classification in accordance with GSEP Section 4. - (CR)	3	____	____
e. Demonstrate the ability to transfer Command and Control authority from the Control Room to the TSC in accordance with procedures and policies. -(CR, TSC)	3	____	____
f. Demonstrate the ability to transfer Command and Control authority from the TSC to the EOF/CEOF in accordance with procedures and policies. - (TSC, EOF, CEOF)	3	____	____
g. Demonstrate the ability to transfer Command and Control authority from the CEOF to the EOF in accordance with procedures and policies. - (EOF, CEOF)	3	____	____
h. Demonstrate the ability to maintain current and accurate information on Status Boards by updating at least every thirty (30) minutes. - (TSC, OSC, EOF)	2	____	____
i. Demonstrate the ability to maintain information on the Electronic Status Board in accordance with procedures and policies. - (TSC, EOF)	1	____	____
j. Demonstrate the ability to exchange data and technical information between the Emergency Response Facilities in accordance with procedures and policies. - (CR, OSC, TSC, EOF, CEOF, JPIC, OSC/FIELD TEAMS)	3	____	____
5) <u>Emergency Direction and Control</u>			
a. Demonstrate the ability of the Directors and Managers to provide leadership in their respective areas of responsibility as specified in GSEP and position-specific procedures. (CR, TSC, OSC, EOF, CEOF, JPIC)	4	____	____

	Weight Factor	Raw Score	Weighted Score
b. Demonstrate the ability to prioritize resources for Inplant Team activities in accordance with Station procedures. - (CR, TSC)	3	____	____
c. Demonstrate the ability to assemble, dispatch and brief Inplant Teams in accordance with Station procedures. - (OSC)	4	____	____
d. Demonstrate the ability of in-plant teams to perform their assigned functions. - (OSC)	4	____	____
e. Demonstrate the ability of the OSC Staff and team members to conduct a thorough debriefing following the completion of assigned tasks. - (OSC)	3	____	____
f. Demonstrate the ability to acquire and transport Emergency equipment and supplies necessary to mitigate or control unsafe or abnormal plant conditions. - (CR, TSC, OSC, EOF)	3	____	____
g. Demonstrate the ability of the Acting Station Director, Station Director, OSC Director and MEO to provide briefings and updates concerning plant status, event classification, and activities in progress at least every sixty (60) minutes. - (CR, TSC, OSC, EOF, CEOF)	3	____	____
h. Demonstrate the ability to provide access for the NRC Site Team in accordance with Access Control procedures. - (TSC, EOF)	3	____	____
i. Demonstrate the ability to provide an initial briefing to the NRC Site Team. - (CR, TSC)	3	____	____
j. Demonstrate the ability to provide the NRC Site Team with adequate and timely information pertaining to critical emergency response activities. - (CR, TSC, EOF)	3	____	____
k. Demonstrate the ability of individuals in the Emergency Response Organization to use position specific procedures. - (CR, TSC, OSC, EOF, CEOF, JPIC, OSC/FIELD TEAMS)	3	____	____

	Weight Factor	Raw Score	Weighted Score
1. Demonstrate the ability to assemble and account for on-site personnel within thirty (30) minutes of announcing the assembly. ** (CR, TSC, OSC)	5	____	____
n. Demonstrate the ability to identify and designate non-essential personnel within thirty (30) minutes after completion of Site Accountability. - (TSC)	3	____	____
p. Demonstrate the ability to explain the evacuation route, brief personnel and arrange for traffic control prior to initiating site evacuation. - (TSC, EOF)	3	____	____
6) Recovery			
a. Demonstrate the ability to identify the criteria to enter a Recovery classification in accordance with procedures and policies. - (TSC, EOF)	3	____	____
b. Demonstrate the ability to generate a Recovery Plan which will return the plant to normal operations in accordance with procedures and policies. - (TSC, EOF)	3	____	____
c. Demonstrate the ability to determine long-term recovery staffing requirements. - (TSC, EOF)	1	____	____
d. Demonstrate the ability to coordinate recovery actions with the State. - (TSC, EOF)	3	____	____
7) Security			
a. Demonstrate the ability of the Security force to respond to an emergency situation in accordance with procedures and policies. - (TSC, EOF)	3	____	____

	Weight Factor	Raw Score	Weighted Score
b. Demonstrate the ability of the Security Director/ Safeguards Specialist to coordinate actions per the Nuclear Station Security Plan with the GSEP. - (TSC, EOF)	3		
c. Demonstrate the ability to establish access control to Emergency Response Facilities. - [(TSC, EOF, JPIC (remote only)]	3		
d. Demonstrate the ability of the Safeguards Specialist/Security Director to coordinate emergency response action with appropriate offsite agencies. (e.g., evacuation routes with County Sheriff, NRC Safeguards personnel). - (TSC, EOF)	3		
8) Public Information			
a. Demonstrate the ability to activate the Joint Public Information Center (JPIC) within sixty (60) minutes of EOF activation. - (JPIC)	3		
b. Demonstrate the ability to respond to Media requests within sixty (60) minutes in accordance with policies and procedures. - (JPIC)	3		
c. Demonstrate the ability to prepare accurate Press Releases within ninety (90) minutes of a significant event while in a Site or General Emergency. ** (JPIC)	4		
d. Demonstrate the ability to present accurate media briefings within ninety (90) minutes of significant events while in a Site or General Emergency. - (JPIC)	3		
e. Demonstrate the ability to use visual aides to support media briefings in accordance with procedures and policies. - (JPIC)	2		
f. Demonstrate the ability to maintain a CECo representative in the JPIC at all times. - (JPIC)	3		
g. Demonstrate the ability to coordinate information with Non-CECo JPIC representatives for media briefings in accordance with procedures and policies. - (JPIC)	4		

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NARRATIVE SUMMARY

INITIAL CONDITIONS

UNIT 1

Unit 1 is at full power on a 125 day power run. The Loop 1D Temperature instrument failed this morning at 0530 and is Out of Service (OOS). The appropriate bistables have been tripped and the OOS package and LOCAR have been written. IMD is ready to commence troubleshooting the instrument when the scenario starts. A monthly surveillance on the 1B Diesel Generator was started at 0722 this morning because Bus 242 was removed from service for cubicle cleaning and inspection. The 1A Diesel Generator passed it's monthly surveillance at 0400 this morning. Scaffolding is being erected in the vacinity of the 1A Main Steam Isolation Valve (MSIV) for a lagging repair job that will start tomorrow. The scaffolding plan has been reviewed and verified to not interfere with any valve movements in the vacinity of the MSIV.

UNIT 2

Unit 2 is in a 52 day Refueling Outage. The core is off-loaded for risk assessment. Bus 242 was removed from service yesterday for cubicle cleaning and inspection. DC Bus 212 is cross-connected with DC Bus 112 and cross-tie surveillances have been performed. The Unit 2 SAC is running. The following equipment is Out of Service:

- Main Condenser for water box cleaning and inspection.
- 2B Main Feed Pump for turbine maintenance and cleaning.
- 2A Containment Spray Pump for seals inspection and motor cleaning.
- Unit 2 RM-11 down to repair video display (Unit 1 RM-11 still shows Unit 2 data)

PLANT OPERATIONS AT POWER (0730-0802)

At 0742, the 1B Diesel Generator trips due to a broken cable on the mechanical overspeed governor.

Expected Response

IMD should start troubleshooting the failed temperature instrument. The problem should be narrowed down to a resistor on the summing amplifier in the T-cold circuitry. Parts should be located and replaced so that the temperature instrument can be placed back in service. The trip of the 1B Diesel Generator should be investigated locally by operators where they should find that the cause of the trip was overspeed. Maintenance personnel should be dispatched to the Diesel Generator to investigate the cause of the problem.

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ALERT (0802-0931)

At 0802, a fire breaks out in Bus 141. The feed breaker to Bus 141 trips, de-energizing the bus. Extensive damage occurs to Bus 141 that will leave the bus de-energized for the entire scenario.

Expected Response

The Operating Crew should respond to the fire by dispatching the Fire Brigade to the scene. They should realize that power to the unit's ESF busses are reduced to one source per Emergency Action Level (EAL) MA1 (SAT). When this condition persists for fifteen (15) minutes, an ALERT should be declared based on MA1 (Power to ESF Busses Reduced to a Single Source for $\geq$ 15 Minutes). Note that depending on the Operating Crew interpretation, EAL HA5 (Fire or Explosion Affecting Plant Operations) could be used to declare the ALERT. The TSC, OSC and CEOF should be activated and appropriate off-site agencies informed. Once the fire is out, local operators and EMD should be dispatched to the scene to investigate the cause of the fire and estimate the time and mode of repair.

SITE EMERGENCY (0931-1128)

At 0931, a failure of Station Auxiliary Transformer (SAT) 142-2 occurs due to sudden overpressure fault. This failure also causes SAT 142-1 to trip resulting in a loss of off-site power to Unit 1. Power is also lost to 6.9 KV Bus 159 when automatic transfer to the Unit Auxiliary Transformer (UAT) fails. This causes Reactor Coolant Pump (RCP) 1D to trip resulting in a loss of flow reactor trip. The turbine and generator trip which causes a loss of all AC power to Unit 1. AC Instrument busses inverters shift to a DC power supply now fed from station batteries. The Diesel Driven Auxiliary Feed Pump starts and immediatrly shears it's shaft so that no water is available to feed steam generators. The RCS is undergoing a leakage situation as coolant will flow out of the RCP seals as indicated by decreasing RCS pressure and rising containment sump levels. Core flow is now provided by natural circulation of the reactor coolant and cooling is provided by steaming the steam generators (S/Gs) at the setpoint of the S/G safety valves.

Expected Response

The Operating Crew will follow steps of procedure BwCA-0.0 (Loss of All AC Power) to try to mitigate the effects of the power loss. After fifteen (15) minutes have elapsed with no AC power, the TSC should declare a SITE EMERGENCY based on EAL MS1 (Loss of AC Power to ESF Busses). The SITE EMERGENCY could also be declared on EAL FS1 (Loss or Potential Loss of the RCS and Fuel Cladding) because a Red Path on Heat Sink exists when narrow range Steam Generator level is lost and no feedwater flow exists. The EOF should be activated. The TSC may transfer Command and Control to the CEOF at this time but is not required to. When the EOF is manned it should assume Command and Control of the emergency. The Operating Crew will experience difficulty executing it's emergency procedures because they get into a "do loop" without restoring some sort of electrical power. In the mean time, crews should be dispatched from the OSC to expedite the repair of Bus 141, repair of the 1B D/G, and the return to service of Bus 242 so that power may be fed to Bus 142. Splitting of the SATs should be attempted also. However, when attempts to open the motorized disconnect for SAT 142-2 are made, it will not open because arcing has welded it shut. When the Ring Bus is opened and the common SAT manual disconnect is opened, the handwheel mechanism breaks and the disconnect can not be reclosed.

The Operating Crew should also cross-connect DC power from Unit 2 to Unit 1 so that the batteries are not drained of power. If this does not happen, DC power will be lost to Unit 1 and Unit 2 Bus 212 after four (4) hours. They should also attempt to minimize the use of DC power by securing non-essential DC equipment.

GENERAL EMERGENCY (1128-1330)

Shortly after 1100, the S/Gs will go dry and reactor coolant temperature and pressure rise. A Loss of Coolant Accident (LOCA) occurs at 1128 when the B Hot Leg reactor coolant piping has a double-ended shear from fatigue due to the pressure rise and transients experienced earlier. RCS pressure quickly decreases to ambient. The reactor core uncovers and major fuel damage occurs. The pressure in containment rises quickly because there is still no electrical power to run Containment Spray Pumps and Containent Fan Coolers. When pressure reaches just short of 30 psig, the emergency personnel hatch seal ruptures and pressure is slowly released to the environment over a fifty (50) minute period. This results in a release of severe magnitude that is described in the Environmental Release Summary. At 1200, power can be restored to Bus 142 from Unit 2 due to finishing the work required to reassemble Bus 242. When power is restored, a power surge within the Unit 1 RM-11 disables the RM-11 for the remainder of the exercise.

Expected Response

The Operating Crew should detect the LOCA due to rapidly lowering RCS pressure and Accumulator Injection. These indications and alarms will be present due to the instrument busses still being energized. The EOF should declare a GENERAL EMERGENCY based on EAL FG1 (Loss of Two Fission Product Barriers and Potential Loss of the Third). These conditons result from an unisolable breach of containment or rapid unexplained pressure decrease following initial pressure increase (containment), RCS leakage greater than makeup capacity as indicated by a complete loss of subcooling (RCS) and loss of heat sink (Fuel Clad). When power is returned to Bus 142, the Operating Crew should carefully energize equipment to restore Emergency Core Cooling System (ECCS) flow to the reactor per their operating procedures. Restoring Containment Spray will reduce Containment Pressure a little more quickly and reduce the driving force behind the release of fission products to the atmosphere. Field Teams should be positioned to best monitor the release in progress. When the release starts, there is no power to radiation monitors so the Field Teams and the State Reuter-Stokes Monitors should be the first indicaton of radiological problems outside of the station. Due to the magnitude of Containment radiation, Rad Protection personnel should monitor in-plant doses to help protect in-plant teams from overexposure while trying to restore power to the unit.

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RECOVERY (1330-1430)

At 1330, a 24 hour time jump will occur and the Control Room, Field Teams and CSC will terminate play. Unit 1 is in Cold shutdown with decay heat being removed from the core through cold leg recirculation. Unit 1 is receiving power via SAT 142-1 because the common disconnect is fixed and ESF Bus 142 which is cross-tied to Bus 242. Diesel Generator 1B is back in service and is available as an emergency power source to Bus 142. Bus 141 is still without power. Bus bar parts should be replaced within the next 24 hours and Bus 141 will be restored to service. The release to the atmosphere is terminated and a temporary structure has been erected around the outside access to the emergency personnel hatch. Unit 1 is in Cold shutdown with decay heat being removed from the core through cold leg recirculation. Unit 2 refueling activity remains halted until a plan to continue is approved.

Expected Response

The EOF should declare a **RECOVERY** in progress and direct efforts to plan recovery for the plant, pursuant to the conditions provided, as well as planning long term manning requirements for Field Teams and Emergency Response Facilities. The TSC and CEOF should provide input to the EOF to help in this planning phase.

ENVIRONMENTAL RELEASE SUMMARY (1130-1430)

Weather Conditions

The weather calls for Northerly winds for the entire release with sunny to partly sunny skies. Temperatures will be in the low 50s for the release and cool off to the high 20s at night. There will be no precipitation for the next couple of days.

Release Summary

The release starts at 1130 when, after the Loss of Coolant Accident, high containment pressure ruptures the seal around the emergency personnel hatch. Fuel damage occurs due to core uncovery so fission products find their way into containment atmosphere. The rupture of the seal is not catastrophic and it takes containment approximately forty-five (45) minutes to depressurize. Once the containment is depressurized, the motive force for the release is lost and on-site release numbers fall.

Environmental Dose Measurements

The plume continues to generate on-site from 1130 to 1215 when it exits at 1230 due to the loss of motive force. The highest dose rate is measured at point J-4 at 29 mR/HR at 1230. There will be considerable air sample activities measured. At points near the centerline of the plume, there are air sample results as high as thirty-five (35) million cpm measured. The plume moves southerly throughout the exercise. Dose rates up to 26 mR/HR are seen at points along the plume with the peak seen five miles out on the centerline out at 1230. The highest monitor point is H-14 with a peak of 23 mR/HR also at 1230. Air

sample results peak at about thirty-four (34) million cpm at point H-14 a little later at 1245. Air sample results start to decline is the plume continues to dissipate and move to the South. The plume leaves the sixteen (16) mile radius at approximately 1430. Dose rates at the centerline sixteen (16) miles out will drop below 1 mR/HR at that time. The plume will then continue to dissipate as it moves southward.

Protective Actions

The NARS form that reports the GENERAL EMERGENCY should have a release occuring block checked because by the time that the NARS form is issued, the State and Field Teams should have enough information to declare the release. With a GENERAL EMERGENCY and a release occurring, the minimum protective actions required are to evacuate a 0-2 mile radius and shelter the affected sectors out to ten (10) miles (E - S - S). Back calculating will uncover that evacuation to five (5) miles in the affected areas will be necessary because of the thyroid dose rates projected. Since the wind is straddling a border between zones, four (4) affected sectors should be chosen, in this case G, H, J, K. Since it was reported as four (4) affected sectors, wind shift NARS forms do not need to be sent out as the wind varies back and forth over the sector H and J border.