U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-237/90007(DRSS); 50-249/90006(DRSS)

Dockets No. 50-237; 50-249 Licenses No. DPR-19; DPR-25

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Dresden Nuclear Generating Station, Units 2 and 3

Inspection At: Dresden Site, Morris, Illinois and the Corporate Command Center, Chicago, Illinois

Inspection Conducted: April 10-12, 1990

Inspectors: T. Ploski for D. M. Barss, Team Leader — Date: 5/3/90

Accompanying Inspectors:

T. Ploski
G. Martin
S. DuPont

Approved By: W. Snell, Chief, Radiological Controls and Emergency Preparedness Section — Date: 5/3/90

Inspection Summary

Inspection on April 10-12, 1990 (Report Nos. 50-237/90007(DRSS); 50-249/90006(DRSS))
Areas Inspected: Routine, announced inspection of the Dresden Station's annual emergency preparedness exercise, involving a review of the exercise scenario (IP 82302), observation by four NRC representatives of key functions, activities, and locations during the exercise (IP 82301), and a review of selected emergency action levels (EALs) (IP 82201).
Results: No violations, deficiencies, or deviations were identified. The licensee demonstrated an acceptable response to a hypothetical scenario with multiple events and equipment failures. One exercise weakness was assessed related to inadequate contamination and expoure control.

## DETAILS

1. NRC Observers and Areas Observed

D. M. Barss, Control Room (CR), Technical Support Center (TSC), Operational Support Center (OSC)
S. DuPont, CR, TSC
G. Martin, OSC and inplant teams
T. Ploski, Corporate Command Center (CCC)

2. Persons Contacted

Commonwealth Edison

*E. Eenigenburg, Station Manager
*L. F. Gerner, Technical Superintendent
*R. L. Holman, EP Coordinator
*D. E. Sharper, EP Coordinator
*R. Carson, OPS and Onsite Programs Supervisor
*T. Lechton, Operations Senior Administrator
*K. Peterman, Reg. Assurance Supervisor
*G. Griffiths, Stores Supervisor
*K. Kociuba, NQP Superintendent
*S. Vercelli, QA Engineer
*R. Haight, Emergency Planning Consultant
*J. P. Mayer, Station Security Administrator
*M. Korchynsky, Operations
*R. Whalen, Assistant Techical Staff Supervisor
*L. E. Holden, Onsite Program EP Coordinator
*J. A. Silady, Nuclear Licensing Administrator
*C. M. Allen, Nuclear Operations
*D. A. Adam, Assessment Administrator
*G. L. Smith, Operations
*K. Brennan, Regulatory Assessment Administrator
*S. Kelly, Admin. Director
M. Evans, GSEP Trainer
M. Falcone, Group Leader Technical Support

US NRC

*D. E. Hills, Resident Inspector

*Denotes those attending the NRC exit interview held on April 12, 1990.

The inspectors also contacted other licensee personnel during the course of the inspection.

3. Licensee Action on Previously Identified Open Items (IP 92701)

(Closed) Open Item No. 50-237/89021-01: The licensee had demonstrated a problem in properly completing and communicating to State officials utilizing the Nuclear Accident Reporting System (NARS) form in the 1989 exercise. During the 1990 exercise the inspectors observed licensee

personnel in the CR, TSC and CCC complete appropriate NARS forms and communicate with response cell personnel simulating applicable State representatives. From the observations of the inspectors, licensee personnel properly completed NARS forms and effectively communicated utilizing these forms. This item is closed.

4. General

An announced, daytime exercise of the Dresden Nuclear Generating Station Emergency Plan was conducted at the Dresden Station on April 11, 1990. This exercise tested the licensee's emergency response organization's capabilities to respond to a simulated accident scenario which contained multiple events, some related and others unrelated to a central initiating event, without a postulated severe core damage situation. This provided the licensee's staff with a more realistic scenario of events and provided for more extensive involvement by various responders to each event. This was a "utility only" exercise without the participation of federal, state or local agencies.

Attachment 1 to this report describes the scope and objectives of the 1990 exercise. Attachment 2 describes the 1990 exercise scenario.

5. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the Commonwealth Edison Generating Stations' Emergency Plan (GSEP), the Dresden annex to the GSEP, and Emergency Plan Implementing Procedures (EPIPs).

b. Coordination

The licensee's response was coordinated, orderly and timely. If the scenario events had been real, the actions taken by the licensee would have been sufficient to mitigate the accident and permit state and local authorities to take appropriate actions to protect the public's health and safety.

c. Observers

The licensee's controllers/evaluators monitored and critiqued this exercise along with four NRC observers.

d. Exercise Critique

The licensee's controllers/evaluators held critiques in each facility with participants immediately following the exercise. Lead controllers met jointly after the facility critiques to discuss observed strengths and weaknesses for each facility and the overall exercise. The NRC discussed observed strengths and weaknesses, developed independently by the NRC evaluation team, during the exit interview.

6. Specific Observations (IP 82301)

a. Control Room (CR)

The Dresden/General Electric simulator was used as the CR for the exercise. The use of the simulator provided an excellent stage upon which licensed operators could effectively demonstrate what actions they would actually take had the scenario events been real.

CR personnel took prompt actions and initiated a reduction in power in response to an increase in recirculation pump seal leakage. Both the Load Dispatcher and Nuclear Engineer were contacted and consulted concerning the power reduction. An estimation of the increased and total leak rate was developed and evaluated to ensure no technical specification limits had been exceeded.

When a fire was reported in the radwaste upgrade fabrication area, CR staff quickly dispatched the fire brigade, sounded the station fire alarm and provided verbal instruction to personnel in the plant using the plant paging system concerning the location of the fire. This announcement could not be heard by the NRC evaluator in the plant at the time the announcement was made. The licensee is aware that some areas in the plant have limited reception of page announcements.

When control room annunciators were lost due to the burnt fuse block in the 902-34 panel, the Station Control Room Engineer (SCRE) very promptly identified (within approximately 1 minute) this condition as an Alert classification under Emergency Action Level (EAL) 3i. An emergency declaration was made immediately following verification of the condition and EAL. Appropriate Emergency Planning Implementing Procedures (EPIPs) were utilized and actions were initiated in accordance with established procedures. Appropriate forms were quickly located, properly completed and utilized to make required notifications of state and federal (NRC) agencies within established time limits.

The Alert declaration was simulated to be announced from the CR (simulator). This announcement did not provide a reason for the emergency declaration. A brief statement of the basis for the emergency classification should be provided with the initial announcement to ensure plant personnel are properly informed.

Once it was identified that CR annunciators had been lost, approximately eight minutes elapsed before CR operators were directed to increase vigilance of CR indication. This direction could have been more timely.

Communication between CR staff was informal at first. As the scenario progressed and plant conditions deteriorated, the formality of communication did improve. Command and control of CR staff was acceptable but not dynamic. Appropriate logs of emergency actions were initiated by CR personnel.

When the TSC was appropriately staffed and ready to accept responsibilities, the Shift Engineer provided a thorough briefing utilizing established procedural guidance.

Based upon the above findings, this portion of the licensee's program was acceptable. However, the following item is recommended for improvement:

- The procedure for notification of plant staff of an emergency classification should be modified to require advisement of the reason for the classification.

b. Technical Support Center (TSC)

The Technical Support Center (TSC) was rapidly activated. TSC staff assumed emergency responsibilities well within established timeframes.

The Station Director contacted the Shift Engineer and received a detailed briefing on plant conditions and emergency actions prior to accepting responsibilities and declaring the TSC activated.

Throughout the exercise, the Station Director held frequent briefings, utilizing the installed public address (PA) system, to ensure that all emergency response personnel within the TSC and Operational Support Center (OSC) were updated on changing conditions and emergency response actions.

Additional comments were solicited from other key staff personnel and passed over the PA to OSC personnel to ensure they were also updated on important developments. This use of a common PA for both the TSC and OSC provided an effective means to ensure personnel in both facilities were kept informed of important developments in a timely manner.

Status boards in the TSC were kept updated with current and relevant information. General trending information for specific parameters was indicated as appropriate for quick reference by interested parties. Detailed trending information for spent fuel pool level and temperature was maintained separately to ensure close tracking of the changing status of the parameters of most concern to the TSC staff.

Station priorities were established and clearly communicated to all emergency response personnel. As conditions changed, priorities were reassessed and adjusted as necessary to ensure efforts and resources remained focused on the most critical activities. The Station Director frequently conferred with key staff members to ensure agreement on established priorities.

The Site Area Emergency (SAE) condition was classified within 7 minutes of initiating events. Notifications of the SAE declaration were made promptly following established procedures and using designated communication links.

A station assembly and accountability was ordered concurrently with the SAE declaration. Within 19 minutes, 781 plant personnel had been accounted for and 11 missing personnel identified by name. Due to considerations for actual plant work requirements, personnel were released from assembly points immediately upon completion of the assembly. The 11 missing persons were later accounted for. This process took an artificially long period of time since personnel had already been released from assembly areas.

Communications between real and mock NRC players and the Station Director were excellent. Mock NRC players were able to access the plant and report to the TSC within 5 minutes of arrival at the site. The Station Director provided a thorough initial briefing for the arriving response team. Key TSC staff personnel effectively interfaced with mock NRC players to answer questions and provide information as appropriate.

The Stores Director was actively involved in identifying and locating required parts and materials to support ongoing repair activities.

The Station Director frequently and effectively utilized the manpower and collective expertise of key personnel in the TSC to research and determine logical and technically correct solutions to various problems as they developed. Such actions included:

- Identification and repair of shutdown cooling system problems
- Increasing iodine levels in spent fuel pool
- Determination of fuel pool limits and identification of technical background supporting these limits from the Final Safety Analysis Report
- Coordination of plant walkdowns to assess damages
- Identification of potential problems from after shocks

A careful and conservative approach was used in determining criteria upon which to base recovery action discussions.

The Station Director was not well informed on the condition and status of events related to the contaminated, injured man and resin spill. The Radiation Chemistry Director should have been more aggressive in obtaining and disseminating this information.

Five sets of Emergency Plan Implementing Procedures (EPIP) Response Manuals were not distributed to their appropriate recipients until very late in the exercise. Alternate copies of required procedures were available and utilized by key players as necessary.

Based upon the above findings, this portion of the licensee's program was acceptable; however, the following item is recommended for improvement:

- The licensee should establish administrative procedural guidance to ensure the timely distribution of EPIP Response Manuals to key positions.

c. Operational Support Center (OSC)

The Operational Support Center (OSC) was activated in an orderly and timely manner utilizing applicable procedural guidance. Adequate staffing was readily available for assignment as necessary to various response teams.

Status boards were effectively used to record and track multiple response teams. For each team the following information was readily available from the status board: team priority, team number, assigned task, departure and estimated return time, assigned individuals names and badge numbers as well as a record of their daily exposure limit and accumulated dose. These teams were effectively dispatched and monitored as they proceeded with their assigned task.

Good communication was maintained between TSC and OSC key personnel. Task priorities established by the Station Director in the TSC were understood and appropriately addressed by OSC personnel.

Contamination and exposure control during the response to the resin spill and personal injury were inadequate. The one Health Physics (HP) technician who responded to the scene was not capable of handling both the medical response and to establish contamination and exposure control. Additional HP technicians should have been dispatched once the situation was known. The following are examples of inadequate contamination and exposure control:

- the ambulance was driven into the contaminated area
- ambulance personnel entered contaminated areas without proper protective clothing items
- personnel were allowed to enter and spend excessive time in a high exposure area
- the HP technician at scene did not perform a whole body frisk prior to leaving the scene even though he was most likely contaminated
- no steps were taken to protect the ambulance from contamination
- no contamination survey instrument was available at the accident scene

- the simulated ambulance and its crew were never adequately surveyed for contamination

Failure to provide adequate contamination and exposure control during response activities to the resin spill are an Exercise Weakness and will be tracked as Open Item No. 50-237/90007-01.

The HP technician who responded to the injured man initially entered the spill area and obtained a quick dose rate reading to determine exposure levels. He then proceeded to do a thorough medical survey of the victim to determine the extent of injuries. After assessing the victim's injuries and the dilemma of the man's arm pinned under the cask, the HP technician appropriately summoned additional manpower and equipment to free the trapped individual.

These efforts were undertaken with proper regard for the existing medical and radiological conditions. A good effort was made to provide psychological support for the victim and to keep him informed of what actions were being taken. However, the subsequent first aid treatment of the victim was not adequately performed.

When the victim was moved, no stretcher was employed even though one was brought to the accident scene by responders. When the victim was loaded into the simulated ambulance, no stretcher was used. The treatment for shock was not started until approximately 11 minutes after first aid responders arrived at the scene. When shock treatment was applied, minimal effort was made to protect the injured person from direct exposure with the cold ground he was placed on.

The efforts to apply a splint to the crushed arm were appropriately taken utilizing available first aid supplies, a wire mesh and an ace bandage. However, due to the multiple manipulations of the injured appendage, the victim would have suffered uncalled for increased pain. More appropriate splinting materials, such as inflatable splints, could have been appropriately utilized had they been available. A bottle of saline solution in the first aid kit brought to the scene had an expiration date of February 1990 and should be replaced.

Of the initial three man team who responded to the injured victim, most of the actions were initiated and performed by one individual. A better team response plan should be developed.

The above inadequacies in rendering appropriate first aid treatment to an injured person are an open item and will be tracked by Open Item No. 50-237/90007-02.

Several problems with exercise control were observed during the exercise which adversely affected inplant teams' ability to adequately demonstrate their response capabilities. Some examples are as follows:

- Failure of controllers to communicate with HP personnel prevented their participation in the response to the fire.

- Miscommunication between controllers led responders to report to different areas in response to the same assignment causing unnecessary confusion.

- A mispositioned controller delayed the timely recognition of important plant information.

- The lack of controller guidance prevented the instrument air repair team from actually obtaining necessary supplies to properly utilize the provided mock-ups.

- The dummy utilized as an injured person was not provided with an appropriate security badge and dosimetry, nor did controllers have adequate medical status information to provide responders.

With the exceptions of the exercise weakness and the open item, this portion of the licensee program was acceptable. However, the following item should also be considered for improvement:

- The training, preparation, placement and coordination of exercise controllers should be improved to ensure players receive the appropriate information necessary to evoke the anticipated actions.

d. Corporate Command Center (CCC)

A prudent decision was made to activate the Corporate Command Center (CCC) shortly before 9:00 a.m. due to the existence of several unrelated, abnormal conditions at the Dresden Station. CCC staff activated the facility and began establishing communications with their TSC counterparts in an organized, efficient manner. The Environmental Director and the CCC Director provided accurate initial briefings to their staffs.

The CCC Director and the TSC's Station Director (SD) had conferred and agreed that continued operation of the TSC and CCC was warranted due to the number of abnormal onsite conditions that had recently occurred, even though the loss of CR annunciator situation had been resolved. By about 10:05 a.m., the CCC Director had obtained assurances that the onsite fires had no apparent safeguards concerns among their root causes.

The Environmental Director and Health Physics Specialist exhibited proper concern for the potential radioiodine release from the Unit 3 fuel pool well before the SAE declaration. The Environmental Director's staff adequately monitored pool temperature, refuel floor radiation levels, and containment radiation levels throughout the emergency response.

The Environmental Director's staff had also quickly determined that actual meteorological data were relevant for this exercise scenario. Current and forecast weather conditions were adequately monitored and particular attention was given to determining whether a wind direction change to the potentially affected downwind sectors had occurred. Such a change occurred shortly after 12:30 p.m., was promptly brought to the CCC Director's attention and was communicated to simulated State officials.

The CCC Director assumed control of the licensee's response at 10:20 a.m. At that time, proper decisions were made regarding which facility (TSC or CCC) would assume responsibility for communications with the simulated NRC and State officials. Since the CCC is not equipped with an ENS telephone, TSC staff retained responsibility for communicating over that dedicated line. Some HPN communications were performed by CCC staff. CCC staff also assumed responsibility for NARS communications once TSC staff had completed the initial notification call to the State for the Site Area Emergency (SAE) declaration.

CCC staff prepared hourly update messages to the State in accordance with the emergency plan's commitment. The CCC Director approved these messages prior to their transmittal at roughly one hour intervals. Copies of these messages were transmitted to the TSC.

The CCC Director remained well aware of degraded onsite conditions and associated corrective actions. He conducted periodic update briefings of his staff and routinely solicited their inputs. These briefings were well done, with the only minor flaw being that not all CCC staff were promptly told of the reason (earthquake related damage) that had placed the EOF out of service. The unavailability of the EOF was later noted on the electronic status board output distributed in the CCC.

The CCC Director made a prudent decision to let his Environmental Director and the TSC's Environs Director choose who should direct the two Environs Teams. TSC staff retained control of these teams. CCC environmental staff monitored the TSC's communications with these teams and occasionally offered suggestions regarding the teams' deployment to their TSC counterparts.

The Environmental Director monitored the need for offsite Protective Action Recommendations (PARs), and gave the CCC Director good advice regarding the appropriateness of the "prepare for possible action" recommendation and what conditions could warrant a "take shelter" offsite PAR. The offsite recommendation appropriately remained "to prepare for possible action."

Status boards were adequately kept up to date. Hardcopy outputs of Safety Parameter Display System (SPDS) displays were posted. Electronic status board information generated by TSC staff was transmitted to the CCC, where it was distributed to key CCC staff to supplement their verbal briefings.

The CCC Director simulated calls to the LaSalle and Braidwood Stations to determine whether they had experienced the earthquake as had the Dresden Station. Later, environmental staff contacted both stations to arrange for additional field survey monitoring teams should the need arise.

The CCC's Information Coordinator prepared five press releases, four of which were issued before exercise termination. The CCC Director reviewed all draft press releases. However, the CCC Director did not identify two relatively minor errors in the otherwise well-detailed press releases. News Release No. 1 did not clearly indicate which of several events listed had warranted the Alert declaration. Although New Relase No. 2 correctly indicated that the transport of a contaminated/injured man to a local hospital was not due to the earthquake, the cause of the accident was incorrectly reported as an overturned truck in a radwaste handling area.

The Information Director arranged for an alternate JPIC to be established in the Joliet, Illinois, area once it was determined that the EOF/JPIC facility near Mazon, Illinois, had sustained earthquake damage. The alternate JPIC location was well described in a news release.

The CCC Director had his staff began compiling a list of onsite recovery action items before 1:00 p.m., even as they continued to monitor degraded plant conditions. Criteria in the emergency plan were followed in order to determine whether a declaration of Recovery could be made prior to exercise termination. In view of the ongoing earthquake damage assessments, proper concern for wanting fuel pool temperature to return to a near-normal temperature, and concern over possible aftershocks, the situation correctly remained classified as a SAE. The CCC Director conferred with the TSC's SD on the recovery action item list and the Recovery classification concerns prior to exercise termination.

Based upon the above findings, this portion of the licensee's program was acceptable. However, the following item should be considered for improvement:

- The CCC Director should ensure that the causes of all classifications and abnormal onsite conditions, as they are known at the time, are clearly described in news releases issued by the CCC staff.

e. Field Monitoring Teams

Field monitoring teams were not directly observed during this exercise. The activities of the Environs Director and his staff in the TSC were observed briefly. Appropriate radio communications were maintained between the field teams and the TSC. Field monitoring results were reported and correctly recorded utilizing established procedural guidelines and available forms. Appropriate plant parameters were monitored and trended to provide early indication of any developing events.

Based upon the above findings, this portion of the licensee program was acceptable.

7. Exercise Scenario (IP 82302)

The exercise objectives and draft scenario were submitted to the NRC for review in accordance with established NRC timeframes. Comments were provided to the licensee following a review of the draft scenario.

The scenario was sufficiently challenging for a utility only exercise and included multiple unrelated events as well as several activities related to a central initiating event.

The licensee very effectively made use of several mock-ups to provide realistic conditions for responders to timely demonstrate implementation of corrective actions. This use of mock-ups is highly commendable and encouraged. However, as previously noted, controller training needs improvement to more effectively utilize these mock-ups.

The licensee's scenario was very realistic and the supporting control messages, alarm messages, control room and maintenance/operator information were logical and well matched to scenario conditions.

Based upon the above findings, this portion of the licensee's program was acceptable.

8. Licensee Critiques

The licensee's controllers/evaluators held critiques in each facility with the participants immediately following the exercise. Lead controllers met after the facility critiques to discuss observed strengths and weaknesses for each facility and the overall exercise. NRC personnel attended several of these critiques and determined that the self-critique process was well performed. Significant NRC identified exercise deficiencies had also been identified by licensee personnel, as well as numerous other items.

Based upon the above findings, this portion of the licensee's program was acceptable.

9. Emergency Action Levels (EALs) Use and Review (IP 82201)

During recently conducted operator examinations (see Report No. 50-237/OL-90-01), a weakness was identified with proficiency in the use of the Generating Station Emergency Plan (GSEP) and Emergency Plan Implementing Procedures (EPIPs). This concern was specifically evaluated during the exercise and no weaknesses were observed by the NRC exercise evaluation team. Personnel in the control room (simulator), Technical Support Center and Corporate Command Center were observed to effectively and efficiently utilize the established GSEP and associated EPIP. There does not appear to be any weakness among the plant operating staff to proficiently use the EPIPs or the GSEP. This weakness seems to be more of a problem with new trainees in the operator training program. This matter was discussed with licensee representatives and the NRC Senior Resident Inspector. Both concurred with this conclusion.

A second item was discussed in Report No. 50-237-OL-90-01 which identified a concern with a very restrictive use of criterion-based emergency classifications. Dresden's Emergency Action Level (EAL) classification (EPIP 200-11) procedure requires the use of specific criteria to assess the failure of Fission Product Barriers. The criteria used to classify an Alert, Site Area Emergency, and General Emergency conditions are very restrictive. For example, the only fuel cladding failure criterion is a grab sample activity equivalent to 300 uCi/g dose equivalent of I-131; the Reactor Coolant System (RCS) failure criterion is containment pressure greater than 2 psig AND reactor vessel level of less than or equal to -59 inches with controlled evolution not in progress. These criteria do not consider other applicable conditions such as: High Main Steam Line Radiation, High Air Ejector Condenser Monitors or High Primary Containment Monitors as conditions or indications of fuel failure or the failure of the RCS outside the primary containment, which would preclude the required 2 psig containment pressure.

This concern was discussed with licensee personnel during the course of this inspection. It was determined that similarly restrictive, specific criteria are used generically at other Commonwealth Edison sites in their respective EALs.

Less restrictive criteria need to be developed and implemented to provide more rapidly identifiable indications of core damage and cladding failure to operating personnel. The time required to obtain and analyze grab samples for specific isotopic activity could unnecessarily delay the initiation of appropriate emergency classifications and timely protective action recommendations.

Additionally, the requirement to identify both the conditions of specific containment pressure and reactor vessel level before determination of a loss of Reactor Coolant System (RCS) integrity does not take into account the possibility of RCS failure outside of the primary containment. A less restrictive criteria which would provide operating personnel a basis to identify RCS leakage outside of containment should be provided. This concern for restrictive criteria based EALs will be tracked as Open Item No. 50-237/90007-03. It is recognized that this open item has applicability to other licensee sites and as such will require that these concerns be addressed by licensee personnel other than those specifically assigned to the Dresden Station; however, the open item will be tracked under the identified number and will be considered to generically apply to the licensee's other sites.

10. Open Items

Open items are matters which have been discussed with the licensee which will be reviewed further by the inspector and which involve some action on the part of the NRC or licensee or both. Three open items were identified during this inspection. They are discussed in detail in Paragraphs 6.c and 9 of this report.

11. Exit Interview

The inspection team held an exit interview on April 12, 1990, with the licensee representatives denoted in Section 2. The NRC team leader discussed the scope and findings of the inspection. No violations of NRC requirements were identified. The licensee was informed of the Exercise Weakness identified during the inspection and was requested to redemonstrate proper contamination and exposure control at a future drill or exercise.

The licensee was asked if any of the information discussed during the exit interview was proprietary. The licensee responded that none of the information was proprietary.

Attachments:
1. Dresden 1990 Exercise Scope and Objectives
2. Dresden 1990 Exercise Scenario Outline

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

## OBJECTIVES

PRIMARY OBJECTIVE:

Commonwealth Edison will demonstrate the ability to implement the Generating Station Emergency Plan (GSEP) to provide for protection of the public health and safety in the event of a major accident at the Dresden Nuclear Power Station. The 1989 demonstration will be conducted during the hours which qualify as a daytime Exercise in accordance with NRC Guidelines.

SUPPORTING OBJECTIVES:

1) Assessment and Classification

   a. Given information provided by the Exercise Scenario, demonstrate the ability to assess initiating conditions which warrant a GSEP Classification within fifteen (15) minutes.
   - (CR, TSC)

   b. Demonstrate the ability to determine which Emergency Action Levels (EALs) are applicable within fifteen (15) minutes of determination of the initiating conditions warranting classification.
   - (CR, TSC)

2) Notification and Communications

   a. Demonstrate the ability to correctly fill out a NARS form in accordance with EPIPs or EOF procedures.
   - (CR, TSC)

   b. Demonstrate the ability to make applicable notifications to offsite State and local organizations within fifteen (15) minutes of making an Emergency classification.
   - (CR, TSC)

   c. Demonstrate the ability to correctly fill out an ENS Notification Worksheet in accordance with EPIPs or EOF procedures.
   - (CR, TSC, CEOF)

   d. Demonstrate the ability to notify the NRC immediately after the State notifications and within one (1) hour of the Emergency classification.
   - (CR)

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2) Notification and Communications (cont'd)

e. Demonstrate the ability to provide information updates to the States at least hourly and within thirty (30) minutes of changes in monitored conditions.
- (CR, TSC, CEOF)

f. Demonstrate the ability to make Protective Action Recommendations (PARs).
- (TSC)

g. Demonstrate the capability to contact appropriate support organizations that would be available to assist in an actual emergency within one (1) hour of conditions warranting their assistance.
- (TSC, CEOF)

h. Demonstrate the ability to maintain an open-line of communication with the NRC (ENS) upon request.
- (TSC, CEOF)

i. Demonstrate the ability to provide information updates to the NRC at least hourly and within thirty (30) minutes of changes in monitored conditions.
- (CR, TSC, CEOF)

3) Emergency Facilities

a. Demonstrate the ability to activate the on-site Emergency Response Facilities within thirty (30) minutes of the Alert Classification in accordance with EPIPs.
- (TSC, OSC)

b. Demonstrate the ability to augment the Control Room staff within thirty (30) minutes of an appropriate Emergency Classification in accordance with the EPIPs.
- (CR)

c. Demonstrate the ability to activate the Corporate EOF within approximately one (1) hour of the Site Emergency Classification in accordance with EOF procedures.
- (CEOF)

d. Using information supplied by the Exercise scenario, demonstrate the ability to record, track and update information on Status Boards at least every thirty (30) minutes.
- (TSC, OSC, CEOF)

e. Demonstrate the ability to document all Operations and Maintenance Team activities in logs and on appropriate Status Boards.
- (CR, TSC, OSC)

3) Emergency Facilities (cont'd)

f. Demonstrate the ability to track all in-plant job statuses in logs and on Status Boards.
- (CR, TSC, OSC)

g. Demonstrate the ability to provide Station activity updates to the CEOF at least every thirty (30) minutes.
- (TSC)

4) Emergency Direction and Control

a. Demonstrate the ability of the individuals in the Emergency Response Organization to perform their assigned duties and responsibilities as specified in Generic GSEP and position-specific procedures.
- (CR, TSC, OSC, CEOF)

b. Demonstrate the ability of the Managers and Directors to exert Command and Control in their respective areas of responsibility as specified in Generic GSEP and position-specific procedures.
- (CR, TSC, OSC, CEOF)

c. Demonstrate the ability to coordinate Operations and Maintenance activities during abnormal and emergency situations.
- (CR, TSC, OSC)

d. Demonstrate the ability to prioritize in-plant Maintenance activities during abnormal and emergency situations.
- (CR, TSC, OSC)

e. Demonstrate the ability to requisition emergency equipment and supplies necessary to mitigate or control unsafe or abnormal plant conditions.
- (CR, TSC, CEOF)

f. Demonstrate the ability to acquire and transport emergency equipment and supplies necessary to mitigate or control unsafe or abnormal plant conditions.
- (TSC, OSC, CEOF)

g. Demonstrate the ability to assemble and account for all on-site personnel within thirty (30) minutes of sounding the Assembly Alarm.
- (TSC)

4) Emergency Direction and Control (cont'd)

h. Demonstrate the ability of Emergency Response Facility Management to provide briefings and updates concerning plant status, event classification and activities in progress at least every thirty (30) minutes.
- (CR, TSC, OSC, CEOF)

i. Demonstrate the ability to provide access for a Mock NRC Site Team in accordance with Access Control procedures.
- (TSC)

j. Demonstrate the ability to interface with a Mock NRC Site Team.
- (TSC)

5) Radiological Assessment and Protective Actions

a. Demonstrate the ability to trend plant radiological survey information for conditions presented in the scenario.
- (TSC, OSC, CEOF)

b. Demonstrate the ability to collect and document all radiological surveys taken for conditions presented in the scenario.
- (OSC)

c. Demonstrate the ability to take appropriate protective actions for on-site personnel in accordance with Station EPIPs.
- (TSC, OSC)

d. Demonstrate the ability to adequately prepare and brief personnel for entry into a High Radiation Area in accordance with Station procedures and policies.
- (TSC, OSC)

e. Demonstrate the ability to issue and adminstratively control dosimetry to the teams dispatched from the OSC in accordance with established policies and Station procedures.
- (OSC)

f. Demonstrate the ability to establish radiological controls in accordance with established Health Physics policies and plant procedures.
- (OSC)

g. Demonstrate the ability to monitor, track and document radiation exposure to inplant Operations and Maintenance Teams in accordance with established policies and plant procedures.
- (OSC)

5) Radiological Assessment and Protective Actions (cont'd)

h. Demonstrate the ability to establish radiological monitoring and controls of Assembly areas in accordance with established policies and plant procedures.
- (OSC)

i. Demonstrate the ability to perform decontamination of radioactively contaminated individuals in accordance with established policies and procedures.
- (OSC)

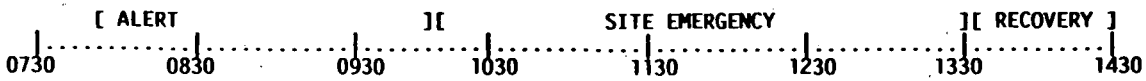
6) First Aid Actions

a. Demonstrate the ability of a First Aid Team to promptly respond to the scene and evaluate the situation within 15 minutes of receiving notification of a problem.
- (OSC)

7) Recovery

a. Demonstrate the ability to identify the criteria to downgrade or enter a Recovery classification in accordance with procedures.
- (TSC, CEOF)

DRESDEN 1990 EXERCISE TIMELINE




ALERT - [0830 - 1000] LOSS OF ANNUNCIATORS
SITE EMERGENCY [1000 - 1330] EARTHQUAKE > 0.2g

0730 INITIAL CONDITIONS
0750 RECIRC PUMP LEAK INCREASES
0800 (EST) OPERATORS OBSERVE/MONITOR RECIRC PUMP LEAK
0805 FIRE IN RAD WASTE
0825 FIRE IN 902-34 PANEL
0830 LOSS OF 3, 5, AND 8 PANEL ANNUNCIATORS FROM FIRE
0835 (EST) 903-34 PANEL DAMAGE ASSESSED
0845 (EST) START REPAIRS OF ANNUNCIATOR DAMAGE
0900 RADWASTE RESIN "HIC IS DROPPED"
0930 (EST) START CLEAN UP OF SPLIT RESINS
0945 (EST) CONTAMINATED INJURED WORKER TAKEN BY AMBULANCE
0955 (EST) ANNUNCIATORS REPAIRED
1000 EARTHQUAKE (SHUTDOWN COOLING SPOOL PIECE DAMAGED)
1000 REACTOR SCRAMS (GROUP I ISOLATION)
1005 INSTRUMENT AIR ALARMS
1005 (EST) START PLANT WALKDOWNS
1005 EOF REPORTS EXTENSIVE EARTHQUAKE DAMAGE
1010 INDICATIONS OF WATER LEAKING
1020 (EST) START INSTRUMENT AIR REPAIRS
1020 UNIT 3 FUEL POOL SKIMMER ALARM
1030 UNIT 3 C SHUTDOWN COOLING PUMP TRIPS
1035 FUEL POOL TEMPERATURES INCREASE
1045 MINOR EARTHQUAKE DAMAGE REPORTED
1050 (EST) DISCOVER BROKEN SPOOL PIECE
1100 START SPOOL PIECE REPAIRS
1115 (EST) RESIN SPILL CLEANED UP
1210 MINOR EARTHQUAKE DAMAGE REPAIRED
1230 (EST) SPOOL PIECE REPAIRED
1230 (EST) INSTRUMENT AIR REPAIRS COMPLETED
1245 START FILL OF FUEL POOL
1300 START "C" SHUTDOWN COOLING PUMP
1315 FUEL POOL TEMP DECREASING
1330 ENTER RECOVERY

193D/wjm

**DRESDEN NUCLEAR POWER STATION**

**1990 GSEP EXERCISE**

**APRIL 11, 1990**

## INITIAL CONDITIONS

**(0730 - 0820)**

Unit 3 was recently shut down for refueling and has just defueled with fuel handling in progress. Fuel Pool water temperatures are slightly elevated and 3 C Shut Down Cooling is being used to cool the Fuel Pool. Unit 2 is currently at 95 % power and has been operating at high power levels for the last six months. There is a known problem with the Unit 2A Recirc Pump Seal. Work is being performed on the Halon System in the Auxiliary Electric Room and a Fire Watch is Stationed in the Auxillary Electric Room while the Halon System is Out of Service. At 0750, the Unit 2A Recirc Pump which already has a pre-existing seal problem develops a leak in the other seal resulting in alarms and other indications in the Control Room.

At 0805 hours, a painting contractor, working in the Rad Waste Fab Area, knocks a can of paint thinner into a space heater. The paint thinner ignites and the flames spread to a 55 gallon drum of expoxy based paint which also catches fire. The Contractor calls the Control Room and reports the fire. If requested, the painter also informs the Control Room that the sprinklers did not come on.

## EXPECTED ACTIONS

The Control Room should start to reduce power and flow in preparation for and shutdown of 2A Recirc Pump. After the phone call concerning the Fire in Rad Waste is received, the Control Room should form the Fire Brigade. The Fire Brigade should go to the scene of the fire and take prompt actions to extinguish the fire. Investigation to determine why the Sprinkler System did not work may also be performed.

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## ALERT

(0830 - 1000)

While the Control Room is dealing with the Recirc Pump Problem, at 0830, a bell is heard in the Control Room and all Unit 2 annunciators are lost except for DC Power Failure Alarms on all the panels. At this time, the Fire Watch, stationed in the Auxiliary Electric Room, calls the Control Room and reports that smoke is coming out of the 902-34 Panel. In addition, a smoke detection alarm is received on the XL3 Typer. The Fire Watch reports that the smoke is clearing but the room smells like burnt plastic.

At 0900, the "D" ring on an overhead crane sling fails and a Low Level Radwaste High Integrity Container (HIC) Liner filled with 170 cubic feet of dewatered resin falls off the over head crane. The liner was positioned over a trailer with a cask on it to receive the resin liner. The liner, which weighs approximately 6000 lbs., falls through the open roll up doorway and strikes the Radwaste Shipping Supervisor pinning the Supervisor's arm under the HIC liner. The Supervisor is contaminated by the resins and the trapped in a radiation field of 5 R/hr.

## EXPECTED ACTIONS

The Control Room should declare an Alert due to loss of all Annunciators. Unit 2 should continue to operate with Control Room personnel monitoring appropriate parameters. A Supervisor should be dispatched to the Auxiliary Electric Room to investigate the smoke, and repairs to the 902-34 Panel Fuse block should be started.

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ALERT

(0830 - 1000)

EXPECTED ACTIONS(cont'd)

An Operating Supervisor and Rad Protection personnel should be promptly dispatched to the dropped HIC liner, the liner rigged and lifted off the injured victim. The victim should be stabilized and decontaminated as much as possible. Appropriate notifications should be made on the contaminated injured Supervisor and an ambulance called from Coal City. Once the ambulance arrives, the victim will be treated and taken by ambulance to the hospital. The area containing the spilled resins should be controlled, surveyed and posted. Clean up of resins may be started if time and resources permit.

SITE EMERGENCY

(1000 - 1300)

At 1000, an earthquake measuring greater than 0.2 Gs strikes the Site. The earthquake causes enough vibrations that a Group 1 isolation occurs which SCRAMS Unit 2. Depending upon the timeliness of 902-34 panel repairs, annunciators may or may not be operable at the time of the SCRAM. In addition, the earthquake creates waves in the TORUS resulting in TORUS level HI/LO alarms. Earthquake related damage includes a spool piece on the Shut Down Cooling Line, Instrument Air (IA) lines, a broken fire main header in the crib house and several minor problems in the plant.

The damaged Shut Down Cooling spool piece leaks causing fuel pool to level to drop below the fuel pool skimmer wiers. This causes cooling pumps to trip on low suction and fuel pool cooling is lost. Fuel pool temperature will start to rise and eventually reach levels that release Iodine from the water. If Iodine is released from the water it will create a local airborne problem in the Fuel Pool area. Leaking water will be observed running down the floor and stairs and sumps pump. IA pressure will drop on both Units, but remain high enough to prevent loss of IA.

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## SITE EMERGENCY

(1000 - 1300)

## EXPECTED ACTIONS

The Control Room should declare a Site Emergency once the magnitude of the earthquake is known. Proper procedural actions should be taken in response to the Group 1 isolation and SCRAM and the Isolation Condenser should be started. Damage Assessment Teams should be formed and sent into the Plant. Damage reports should be made back to the TSC/OSC and work should be coordinated and prioritized.

Personnel should be sent to the Fuel Pool in response to the pump trip alarms. The lower water level and the increasing fuel pool temperature should be observed by personnel sent to the Fuel Pool. The problem with the broken Shut down Cooling spool piece should be recognized and Shut down cooling isolated from the Fuel Pool. Once water is added restoration of Fuel Pool cooling will help stabilize temperatures but not be sufficient to lower temperatures until Shut Down Cooling (or other alternate cooling is established).

## RECOVERY PHASE

(1300 -1500)

By 1300 Operator actions in the Control Room will have resulted in Unit 2 being close to cold shut down. The problem with the Shut Down Cooling spool piece is understood and repairs have either been started or completed. Fuel Pool temperatures have either stabilized or started to decrease. Assessment of earthquake damage is complete and the extent of damage is understood. The damage IA lines have been isolated/temporarily patched and IA pressure has increased back to normal levels.

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## RECOVERY PHASE

(1300 -1500)

## EXPECTED ACTIONS

Determination if conditions warrant Recovery and planning for Recovery Phase work should take place. Clean up of contamination from the spilled resins should be completed and the area released. Work should be started on the damaged shutdown cooling line if not already started. Permanent repairs should be planned for the damaged IA lines.

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** LOSS OF ANNUNCIATORS

**DESCRIPTION:** With Unit 2 running at full power, at 0830, a "ding" is heard in the Control Room and all annunciators are lost except for the DC Power Failure Alarm on every power panel. The Control Room receives a phone call from the Fire Watch, who is stationed in the Auxiliary Electric Room due to the Halon System being out of service. The Fire Watch reports that smoke is coming out of the 902-34 Panel and the smoke has caused the room to smell. In addition, smoke detector alarms are received on the XL3 fire alarm typer. The Fire Watch reports that the smoke is clearing and it appears that the fire may be out.

**CHALLENGING ASPECTS:** The Control Room must operate the Plant with no annunciators on Unit 2. If timely repairs are not made, activities after 1000 a.m. will be greatly complicated when an earthquake causes the Reactor to SCRAM and damages Instrument Air (IA) lines which could result in loss of Instrument Air if the IA problem is not quickly diagnosed and corrected.

**EXPECTED ACTIONS:** All unnecessary activities should be suspended and available Control Room Staff assigned to monitor plant parameters. A Shift Supervisor should be dispatched to the Auxiliary Electric Room. The Fire Brigade may or may not be dispatched depending on how the various fire alarms and the phone call from the Fire Watch is interpreted. The problem should be diagnosed as burnt up Normal Power Fuse Block. Electricians should disconnect the burnt fuse block and connect to the Reserve Feed which will allow recovery of annunciators.

**MOCKUPS:** A bell will sound on the Control Room (Simulator) and all other annunciators will be silenced. All annunciators will be disabled to prevent reading annunciator information.

A mock 902-34 panel will be utilized. The mock up will be wired as the 902-34 panel, wires will originally be attached to a burnt fuse block (normal power) and a good fuse block (reserve power) will be available to re-connect the wires.

0172D/1/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** LOW LEVEL RADWASTE RESIN HIGH INTEGRITY CONTAINER (HIC) LINER IS DROPPED

**DESCRIPTION:** At 0900, the "D" ring on the Overhead Crane sling fails and a Low Level Radwaste HIC Liner filled with 170 cubic feet of dewatered resin falls off of the overhead crane. The liner was positioned over a trailer with a cask on it to receive the resin liner. The liner, which weighs approximately 6000 lbs., falls and hits the front of the semi-tractor and falls through the open roll up doorway. As the liner came to rest, it struck the Rad Waste Shipping Supervisor who was outside the door counting empty drums. The Supervisor's arm is pinned under the liner and the Supervisor has other minor injuries. The dose rate from the dewatered resins is 5 R/hr and spilled resins from the broken liner are all over the ground in the vicinity of the injured Supervisor who is also highly contaminated from the spilled resins.

**CHALLENGING ASPECTS:** The challenging aspects of this event is to promptly respond to a seriously injured worker trapped in a High Radiation and highly contaminated area.

**EXPECTED ACTIONS:**

**MOCKUPS:** An empty HIC Liner will be used to simulate a full liner. A dummy will be initially utilized with its arm pinned under the "HIC" Liner and rigging must be performed to lift the liner off the trapped arm. After the HIC has been lifted, the injured worker will be made up with a moulage. Contaminated resin will be mocked up using shelled corn.

0172D/2/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** INJURED RADIOACTIVELY CONTAMINATED INDIVIDUAL

**DESCRIPTION:** While working in the D 2/3 Radwaste Truck Bay, a Supervisor is injured by a HIC when it falls from the overhead crane. His left arm is crushed by the HIC and along with his chest becomes contaminated. The HIC must be moved to remove the victim.

**CHALLENGING ASPECTS:** The Rad Protection, Operating and Maintenance personnel involved will need a rig to remove the HIC in order to perform a primary survey of the victim. The victim should be stabilized and not moved until the Emergency Squad arrives. It is determined that the victim has contamination of 5,000 cpm on his left arm and chest in several spots. The contamination should be removed as much as possible before transport to the hospital.

**EXPECTED ACTIONS:** The Coal City Fire Department should be notified immediately after the Control Room (Cell # ) is notified. Rad Protection and an Operating Supervisor should be dispatched to the scene. The HIC should be rigged and moved so that a complete primary survey of the victim can be performed. Victim should be stabilized and decontaminated as much as possible. The victim should not be moved from the area until the Emergency Squad arrives for transport to the hospital. A radiation survey of the area should be made of the area and contamination should be marked off and/or deconned.

**MOCKUPS:** Lantern mantels will be used as sources for the contamination on the victim's left arm and chest area. A HIC and a semi tractor trailer will be used in the truck bay area.

0172D/3/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** FIRE IN RADWASTE UPGRADE FAB AREA

**DESCRIPTION:** At 0805, a Painting Contractor working in the Radwaste Upgrade Fab area knocks a can of paint thinner into a space heater. The paint thinner ignites and flames spread to a 55 gallon drum of epoxy based paint which also catches fire. The contractor then calls the Control Room and reports the fire.

**CHALLENGING ASPECTS:** Timely response is needed to prevent extensive fire damage. The Control Room must coordinate dispatch of the Fire Brigade. Failure to promptly respond to the fire will complicate problems after 1000 a.m. when the earthquake hits.

**EXPECTED ACTIONS:** The Control Room should dispatch a Fire Brigade. The Fire Brigade should be formed and dispatched to the scene of the fire. Prompt actions should be taken to put out the fire.

**MOCKUPS:** An actual fire will need to be extinguished by the Fire Brigade. The fire will set in a designated area. This is being coordinated with the Dresden Fire Marshall.

0172D/4/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** MINOR EARTHQUAKE DAMAGE

**DESCRIPTION:** An earthquake measuring greater than 0.2 Gs onsite occurs. The earthquake causes the Reactor to SCRAM, sets up waves in the Torus and damages several pieces of equipment in the plant. The most significant damage is to Instrument Air lines and damage to the Shutdown System. (IA damage and Shutdown Cooling damage events are discussed separately.) In addition, minor damage occurs in several areas. This damage will be indicated as personnel conduct plant walkdowns after the earthquake.

1. A Nitrogen Tank line will be broken causing nitrogen to leak and forming frost in the vicinity of the leak.

2. A fire main is broken in the Crib House causing water to leak onto the floor and results in partial impairment of the Fire Protection System.

**CHALLENGING ASPECTS:** Except for Shutdown Cooling problems and Instrument Air problems which are discussed separately, earthquake damage does not represent actual threats to plant Safety however, this occurs simultaneously with the more serious problems. The combination of multiple problems challenges all aspects of work planning, priortization and communication between the Control Room, TSC and OSC.

**EXPECTED ACTIONS:** Damage Assessment Teams should be formed and dispatched to walkdown the plant. Upon discovering the minor damage reports should be made and depending upon available resources the leaks should be isolated or simply noted for later work.

**MOCKUPS:** Mockups will be utilized for the Nitrogen Tank Line.

0172D/5/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** LOSS OF INSTRUMENT AIR

**DESCRIPTION:** An earthquake damages an Instrument Air on Unit 2 and on Unit 3. Depending on the availability of Annunciators various alarms are received and damage is discoverable by teams performing plant walkdowns. The damaged Instrument Air line on Unit 2 is on the line feeding the Filter Building HVAC. This leak is easily isolatable and should not cause any problems.

A level 1 Operator making rounds in the Turbine Building will report the break in Unit 3 IA line. This leak is to the Main Feed to Unit 3 Reactor Building. The leak is not isolatable and Unit 3 will loose Instrument Air if timely repairs are not made to the damaged line.

**CHALLENGING ASPECTS:** The Control Room must deal with the damage to IA and isolate or repair the leaks in order to prevent loss of Instrument Air on Unit 3. If IA is lost on Unit 3, additional operational difficulties associated with loss of Instrument Air will occur.

**EXPECTED ACTIONS:** Repair Teams should be dispatched to the Unit 3 IA to Reactor Building line break. Temporary repairs such as a rubber gasket and saddle clamps should be used to stop the leak. The leak to the Unit 2 HVAC Filter Building HVAC should be isolated by turning the valve.

**MOCKUPS:** The Unit 3 IA to Reactor Building Line leak will be mocked up with a capped length of damaged copper line that is connected to source of pressurized air or nitrogen bottle.

0172D/6/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** FUEL POOL COOLING PROBLEMS

**DESCRIPTION:** Unit 3 is in refueling and the Fuel Pool is loaded with recently removed fuel which has resulted in the Fuel Pool being close to its Maximum Heat Load. The Fuel Pool is being cooled by the 3C Shutdown Cooling System and the normal Fuel Pool Cooling System. WHen the earthquake strikes, a spool piece on the 3C Shutdown Cooling Line is damaged and starts to leak. The leak causes loss of water inventory and makeup is insufficient to maintain level. The Fuel Pool Cooling surge tanks empty and the Fuel Pool Cooling pumps trip on low skimmer level while the 3C Shutdown Cooling Pump trips on low suction pressure.

Fuel Pool temperatures start to increase which is noticeable only by local temperature indicators. Fuel Pool water from the damaged Shutdown Cooling Line leaks out the Shutdown Cooling Heat Exchanger Room and runs down the stairs ultimately resulting in Reactor Building sumps operating.

**CHALLENGING ASPECTS:** The source of the leak must be recognized and corrected in a timely manner or fuel pool temperatures will increase to the point where iodine would be released from fuel pool water causing an airborne contamination problem in the plant. It is not anticipated that the problem could go on long enough to cause an actual fuel problem.

**EXPECTED ACTIONS:** Shutdown Cooling should be isolated from the Fuel Pool Cooling System. The Fuel Pool surge tanks should be refilled and the Fuel Pool Cooling system restarted. However, this will not be sufficient to maintain fuel pool temperatures. Repairs should be started on the damaged Shutdown Cooling Line spool piece. Once the line is repaired, Shutdown Cooling should be restarted and fuel pool temperatures will start to drop. Fuel pool temperatures will also start to decrease if alternate means of Fuel Pool Cooling are established.

**MOCKUPS:** A damaged spool piece will be mocked up and have to be repaired.

0172D/7/wjm

DRESDEN NUCLEAR POWER STATION
1990 GSEP EXERCISE

APRIL 11, 1990

EVENT SUMMARY

**EVENT:** REPAIR OF SHUTDOWN COOLING SPOOL PIECE

**DESCRIPTION:** When the earthquake strikes a spool piece on the 3C Shutdown Cooling Line it is damaged and starts to leak, which resulted in loss of water inventory and insufficient cooling capacity to maintain fuel pool temperatures.

**CHALLENGING ASPECTS:** Restoration of Shutdown Cooling is required to maintain fuel pool temperatures and prevent the release of Iodine from the water.

**EXPECTED ACTIONS:** Shutdown Cooling should be isolated from the Fuel Pool Cooling System. Mechanical Maintenance should troubleshoot the problem, obtain gasket material, disassemble the spool piece, install the new gasket and reinstall the spool piece. Once the line is repaired, Operators should restart Shutdown Cooling.

**MOCKUPS:** A damaged spool piece will be mocked up and have to be repaired.

0172D/8/wjm