U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-237/84-10(DRSS); 50-249/84-09(DRSS)

Docket Nos. 50-237, 50-249 License Nos. DPR-19; DPR-25

Licnesee: 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, IL

Inspection Conducted: June 4-6, 1984

Inspectors: T. Ploski (signed T. Ploski)
Team Leader
6/28/84 Date

W. Gloersen (signed William B. Gloersen)
6/28/84 Date

W. Snell (signed W. Snell)
6/28/84 Date

G. Christoffer (signed T. Ploski for)
6/28/84 Date

Approved By: M. P. Phillips, Chief (signed)
Emergency Preparedness Section
6/28/84 Date

Inspection Summary:

Inspection on June 4-6, 1984 (Report Nos. 50-237/84-10(DRSS); 50-249/84-09(DRSS))
Areas Inspected: Routine announced inspection of the Dresden emergency preparedness exercise involving observations by nine NRC representatives of key functions and locations during the exercise. The inspection involved 150 inspector-hours onsite by six NRC inspectors and three consultants.
Results: No items of noncompliance or deviations were identified.

## DETAILS

1. Persons Contacted

NRC Observers and Areas Observed

T. Ploski, Control Room and Technical Support Center (TSC)
W. Snell, TSC
W. Gloersen, Operational Support Center (OSC) and Inplant Health Physics Teams
M. Phillips, Emergency Operations Facility (EOF)
C. Paperiello, EOF
G. Christoffer, EOF and Joint Public Information Center (JPIC)
P. Brown, Control Room
L. Munson, OSC and Inplant Health Physics Teams
F. Carlson, Radiological Environmental Monitoring Teams

Commonwealth Edison and Areas Observed

*G. Wagner, Acting PWR Operations Manager, NRC Role Player
D. Scott, Station Superintendent, Station Director
R. Holyoak, LaSalle Project Manager, Recovery Manager
J. Wujciga, Assistant Superintendent for Administration, Station Director
*T. Ziakis, GSEP Coordinator, Controller, TSC
*R. Stobert, Controller, Control Room
*T. Blackmon, Emergency Planner, Lead Controller, EOF
*P. Sexton, Emergency Planner, Controller, EOF
M. Vincent, Emergency Planner, Controller, EOF
*M. Vonk, Chemistry Training Supervisor, Environmental Communicator
*J. Bowman, Controller, OSC
D. Strobel, Controller, Control Room
J. Barr, Controller, TSC
G. Myrick, Controller, TSC
C. Bennet, Controller, Inplant Health Physics Teams
L. Literski, Controller, Radiological Environmental Monitoring Teams
H. Barch, Controller, Radiological Environmental Monitoring Teams
J. Toscas, Controller, JPIC

*Indicates those present at the June 6, 198[illegible] exit interview.

2. General

An exercise of the licensee's Generating Stations' Emergency Plan (GSEP) and the Dresden Annex was conducted at the Dresden Station on June 5, 1984. State and local organizations requested an exemption from participating in this exercise. The exercise tested the licensee's capability to respond to a hypothetical accident scenario resulting in a major release of radioactive material to the environment. Attachment 1 describes the scenario.

3. General Observations

a. Procedures

The exercise was conducted using the GSEP, Dresden Annex, and Emergency Plan Implementing Procedures used by the Station and Emergency Operations Facility (EOF).

b. Coordination

The licensee's response was coordinated, orderly, and timely. If the event had been real, the actions taken by the licensee would have been sufficient to permit the State and local authorities to take appropriate actions.

c. Observers

Licensee observers monitored this exercise along with nine NRC observers.

d. Critique

The licensee held a critique immediately following the exercise on June 5, 1984. The NRC critique was held at the Mazon Emergency Operations Facility on June 6, 1984. The NRC and the licensee identified weaknesses in their respective critiques as discussed in this report.

4. Specific Observations

a. Control Room

Control Room personnel exhibited good teamwork throughout the exercise. Information transfer from the Control Room to the Technical Support Center (TSC) and Operational Support Center (OSC) was complete, orderly, and timely. Sufficient personnel were assigned by the Shift Engineer (SE) to accomplish communicator duties. However, the Control Room was apparently never advised by either the TSC or Emergency Operations Facility (EOF) of the security vehicle accident and its consequences or of the status of offsite protective actions. It was clear to Control Room staff when transfer of command and control had been made to the TSC and later to the EOF. The Operating Engineer properly anticipated the need to utilize the control rod fast sequence shutdown package; however, drywell pressure increased so rapidly that a reactor SCRAM took place before this package was implemented. Personnel rapidly computed a leak rate increase from several to 24 gallons per minute. Later, the SE correctly utilized steam tables to ascertain which of several drywell pressure indicators was erroneous.

The SE and Duty Supervisor maintained adequately detailed logs throughout the scenario; however, the SE may benefit by delegating log keeping tasks should abnormal events progress more rapidly than in this scenario. The SE made a proper, conservative decision to reclassify conditions from an Unusual Event to an Alert based on a rapid leak rate increase within the drywell of over 20 gallons per minute, despite the fact that the appropriate Alert Emergency Action Level (EAL) called for an increase of at least 50 gallons per minute. The decision was based on the SE not knowing the source of the leak, its unknown rate of future increase, and the increasing drywell pressure. Initial offsite notifications for both the Unusual Event and the Alert were completed in a timely manner. Control Room staff failed to consider the status of the unaffected Unit 3 until several hours after Unit 2's status had begun to deteriorate. Unit 3 status had not been addressed in scenario initial conditions or early messages. Once informed that Unit 3 should be assumed to be operating at power, the SE initiated shutdown of this unaffected unit per procedures.

Periodic habitability surveys were conducted within the Control Room using a Cutie Pie detector; however, Control Room staff did not indicate that they had simulated activation of the room's emergency ventilation system. As noted during the 1983 exercise, the Control Room was not equipped with an emergency supplies locker containing such items as survey instruments, high range self reading dosimetry, thyroid blocking agent, and anti-contamination garments. The room was equipped with sufficient emergency breathing equipment and a first aid kit.

Based on the above findings, the following items should be considered for improvement:

- Control Room staff should be advised by staffs in the TSC, OSC, or EOF of events affecting the expected operation of plant systems and of protective actions involving offsite as well as onsite personnel.

- Provisions should be made for maintaining within the Control Room adequate quantities of radiological emergency supplies as may be needed during prolonged emergency conditions.

b. Technical Support Center

The SE conservatively elected to activate the Technical Support Center (TSC) after declaring the Unusual Event due to a jet pump failure. The TSC was promptly staffed with sufficient technical and administrative support personnel. Since he was never in the Control Room, the TSC's Station Director (SD) received detailed scenario information from the SE by telephone prior to relieving him of Acting Station Director responsibilities. During TSC activation, the SD also advised the SE to activate the Operational Support Center (OSC). The TSC was declared operational within one hour of its activation, but only after the SD indicated that he and his staff were prepared to assume their responsibilities.

The SD effectively managed TSC staff and utilized the facility's public address system to brief them of significant events and major decisions. He kept appraised of staff activities by polling the directors and by directors promptly informing him of matters requiring his attention. He and his staff generally exhibited good judgment and teamwork. The Station, Rad/Chem, and Security Directors recognized the need to initiate assembly/accountability following several instances of Area Radiation Monitors (ARMs) alarming. The Rad/Chem and Security Directors later chose the optimum evacuation route for nonessentials, whose evacuation was simulated following the Site Area Emergency declaration. The Security Director kept the SD informed of the status of assembly, accountability, and evacuation activities, and promptly notified him of the security vehicle's accident. However, the TSC apparently never advised the Control Room of this event. The Environs and Rad/Chem Directors monitored environs teams' communications with the Emergency Operations Facility (EOF) after team control had been transferred to that facility. These individuals also continued to generate dose projections and compared results with protective action recommendation guidance. Thus, when asked by the Recovery Manager to concur with proposed recommendations, the SD was readily able to compare his staff's analyses with those prepared by the EOF. At the beginning of the exercise, appropriate EOF and TSC directors had been given offsite protective action formulation guidance based on the soon to be issued GSEP Revision 4. However, due to the following factors, protective action discussions between the EOF and TSC staffs were not meaningful: personnel seemed somewhat unfamiliar with the revised guidance; there was insufficient interaction between dose assessment staffs and others who were assessing containment failure potential; guidance in Figure 6.3-1(a) and Table 6.3-1 was conflicting for Site Area Emergency classifications; and, while EOF decision makers sought the TSC's concurrence, TSC staff indicated that they were not being given the opportunity to discuss differences in proposed recommendations before the EOF's recommendations were submitted to the State by the Recovery Manager.

Knowledge of and adherence to procedures, internal information flow, habitability monitoring, and security were adequately demonstrated in the TSC. Status boards were kept current; however, they had no provisions for plotting meteorological forecasts and protective action recommendations. Although the EOF obtained a meteorological forecast prior to the General Emergency declaration, this information was never transmitted to the TSC.

Individual directors maintained detailed logs. Prior to the simulated time lapse, a shift change of all TSC directors was demonstrated. The transfer of responsibilities to incoming personnel was very smooth, with each new director receiving verbal briefings supplemented by adequately detailed logbooks. The relief shift demonstrated their abilities to identify short-term needs, goals, and task priorities during the simulated beginning of recovery operations.

Two senior members of the licensee's corporate staff served as NRC role players during the exercise. To better ensure that TSC staff demonstrated their capabilities, the TSC role player generally acted as an information gatherer rather than as an advisor or leader. However, he should have challenged TSC staff more vigorously on several occasions, such as when it became apparent that the TSC and EOF staffs differed on protective action recommendations. The role player was allocated a telephone and was generally left alone to discuss his concerns with whomever he wished.

Based on the above findings, the following items should be considered for improvement:

- Discrepancies in protective action guidance for Site Area Emergencies, as contained in Figure 6.3-1(a) and Table 6.3.1 should be eliminated. For this emergency classification, sheltering or evacuation recommendations significantly beyond the immediate vicinity of the owner controlled area are not warrented.

- TSC status boards should contain provisions for plotting forecast meteorological and protective action recommendation information.

- Forecast meteorological information should be obtained once the need for utilizing current meteorological data becomes apparent.

- Protective action recommendations discussions should be better coordinated between TSC and EOF staffs.

c. Operational Support Center and Inplant Teams

The Operational Support Center (OSC) was activated and staffed with sufficient numbers of Radiation Chemistry Technicians (RCTs) and maintenance technicians in a timely manner; however, assembled personnel were not told when this facility had been declared operational by either the OSC Supervisor or RCT Foreman. The supervisor and foreman interfaced properly during the exercise. A listing of available personnel, which included their exercise and previously accumulated exposure data, was maintained and referenced by these individuals when selecting inplant team members. Briefings given to inplant teams on radiological hazards generally lacked detail and were usually addressed only to RCTs assigned to the teams. Areas Radiation Monitor (ARM) data available from the Control Room and radiation level information reported by other teams were generally not included in these briefings. Although the OSC was equipped with status boards for recording reactor status and other scenario information, not all status boards were located in an area readily visible to technicians awaiting assignment. OSC supervisory personnel, who also kept the status boards current, made insufficient attempts to periodically brief all assembled personnel on relevant information.

One team's RCT was issued a portable ion chamber to which another instrument's calibration information had been affixed. When the person issuing survey instrumentation was informed of this discrepancy by the NRC observer, he correctly placed both instruments out of service and provided the RCT with another instrument.

RCTs generally displayed good survey techniques; however, one RCT was observed not to be walking ahead of those he was escorting. On another occasion, a single RCT was dispatched to perform a perimeter survey within the protected area. This individual was not equipped with a two-way radio and did not record his survey results while performing the survey. He was neither requested to nor did he take an air sample. Some other teams were not equipped with two-way radios. Not all teams having radios chose to utilize them. Such teams either utilized plant telephones or waited until they had returned to the OSC to report on their activities. Although OSC habitability was periodically checked using an ion chamber and an air sampler, a number of returning teams did not go through the readily available portal monitor as a final check for contamination before entering the OSC.

The inspectors observed the collection and analysis of two coolant and two containment air samples. Collection and analysis tests were completed after acceptable elapsed times of about two hours per sample. Technicians collecting the samples were provided with high range self-reading dosimetry, appeared well-trained, and followed appropriate procedures. Several technicians collected a liquid sample having a simulated activity level of about 40 R/hour. The technicians were able, with some difficulty, to move the lead pig containing the sample across the rough, uneven ground between the High Range Sampling System room and the analytical laboratory. Within the laboratory, the high level sample was placed under a hood for dilution. Although leaded glass afforded some shielding at the front of the hooded area, no shielding was provided at the sides of the hood. Lead bricks were available in the area, but there was no apparent guidance regarding under what circumstances these bricks were to be utilized. The sample was later placed for temporary storage within a shielded area; however, the amount of shielding was considered insufficient in view of the sample's activity level and its proximity to counting equipment. The laboratory technician demonstrated proper techniques to reduce his exposure when processing the sample.

Based on the above findings, the following items should be considered for improvement:

- All relevant radiation level information, as available from ARMs and other inplant teams, should be incorporated into briefings of teams being dispatched from the OSC.

- The OSC should be provided with plant layout drawings to facilitate recording of inplant radiation level data for briefing and tracking purposes.

- OSC supervision should periodically brief all assembled staff on relevant information.

- Survey instruments should be rechecked to ensure that each instrument has the correct calibration information affixed.

- RCTs should position themselves at the front of teams they are escorting, and should record survey information on appropriate forms while performing their surveys.

- Survey and other inplant teams should be comprised of more than one person whenever possible.

- Inplant teams should be provided with and should utilize two-way radios as the primary means of communications with the OSC.

- Inplant teams and their OSC supervision should periodically be in voice communication with each other. Teams and their supervision should promptly initiate supplemental communications to report results and to report conditions not anticipated during briefings.

- Teams returning to the OSC should be checked for contamination just prior to entering this facility.

- Procedural provisions should be developed and implemented regarding the use of portable shielding when analyzing suspected high activity samples.

- Temporary storage provisions for post accident samples should afford sufficient shielding to prohibit undesirable radiation affects on analytical equipment and unnecessary exposure of laboratory personnel.

d. <u>Emergency Operations Facility</u>

The permanent EOF, which is located near Mazon, Illinois, was activated in accordance with a draft procedure entitled "Minimum Staffing of Emergency Response Facility." The EOF was activated in a timely manner, and the minimum EOF staffing concept was successfully demonstrated. Transfer of command and control from the TSC to the EOF was smooth, apparent, coordinated, and timely. Command and control functions at the EOF were good. All personnel knew their job responsibilities. All emergency managers followed their procedures and performed well. The Recovery Manager kept himself well informed of his staff's activities. The Recovery Manager approved all press releases prior to their issuance.

EOF access control was poorly handled. Several arriving personnel walked in and took their badges from the badge rack rather than receiving their badges from the access control guards. Additionally, the sign in sheets did not include all of the arrival times for response personnel. They were later filled in by the guards. Badged players occasionally walked out of the EOF without being challenged by the guards. After the initial rush of personnel entering the EOF, the controller provided the guards with a critique several hours before the exercise ended.

Administrative support at the EOF was poor, although log books were kept by each manager. The only individual provided with all message information was the Recovery Manager's Communicator, who ensured that the Recovery Manager was aware of all pertinent information. Since briefings were rarely held which involved discussions of various Managers' activities, information required by some personnel, which was available in the EOF, was never made available to them. One example involved the Rad/Waste Manager's evaluation of iodine capacity for the filtration system. Although the Environmental Emergency Coordinator was aware of the iodine concentration in containment, this information was never correctly conveyed to the Rad/Waste Manager. Status board design was an improvement over that observed in other exercises; however, status boards were not fully utilized. Additional scenario data should have been plotted involving component availability. There was no space for plotting forecast meteorological data nor for specifying a time period for which it would have been valid, although this information was requested and obtained by the EOF staff. In addition, although the TSC personnel were also interested in obtaining a forecast, the information was never communicated back to the TSC. The EOF staff improvised a status board on which to trend data.

Offsite communications were handled effectively. Initial notifications on emergency reclassifications were completed in a timely manner. Release rate updates were periodically transmitted to the State. However, prior to being questioned by the State Department of Nuclear Safety, information regarding the amount of radioiodine which may have been present in the release or projected offsite impact due to radioiodine was not provided. This was due to the fact that the EOF staff failed to consider radioiodine in the initial dose assessment evaluations. Interface between licensee personnel at the EOF and the Illinois Department of Nuclear Safety representative were well handled.

Communications between the EOF and field monitoring teams were effective. The EOF Environs Director notified the TSC Environs Director when she was ready to assume control of the teams and received a formal briefing from her TSC counterpart. Team members were then informed of this transfer over the radio, and all subsequent communications were directed through the EOF.

The initial protective action recommendation was made at the Site Emergency declaration, and was developed based on Table 6.3-1 and Figure 6.3-1(a) of the GSEP; however, confusion arose when the TSC and EOF discovered that these two sets of guidance were contradictory for the same conditions. For this classification, the table correctly recommended no protective actions at this time since the analysis had been completed, while the Figure recommended 2 mile radial and 5 mile downwind sheltering. This protective action is never warranted in a Site Area Emergency based on the definition of this emergency classification (e.g., protective actions should not be warranted except near the site boundary, per NUREG-0654, Appendix 1 Page 1-12). If protective actions were warranted to these distances, the emergency class should have been upgraded to a General Emergency. Even if the analysis was not complete, the figure and table disagreed on the protection action recommendation with the table being appropriate in comparison to the figure. This resulted in confusion between EOF and TSC staffs on the issuance of the protective action recommendations. Overall, the formulation of protective action recommendations was poor in that the Environmental Emergency Coordinator placed too much emphasis on release rate/dose rate in containment for dose assessment results without considering such variables as evacuation time estimates, estimated time to primary containment failure, and forecast meteorology for determination of affected downwind sectors. This additional information should be included in any evaluation of what protective actions may be warranted.

During the exercise, the licensee had a representative playing the role of the NRC Site Team. This individual was very aggressive in seeking information and because of the manner in which he interacted, provided a good simulation of what NRC participation would be like. However, although he often asked questions regarding events and actions licensee personnel were taking, his questions were not always adequately answered.

Based on the above findings, the following items should be considered for improvements:

- Protective action recommendations formulation should include analysis of projected time to containment failure, evacuation time estimates, potential radioiodine concentrations, forecast meteorology, and core conditions as well as dose assessment considerations.

- Figure 6.3-1(a) should be revised to correctly match the corresponding Table 6.3-1 for Site Area Emergency protective action recommendations.

- Additional training should be provided to personnel responsible for access control at the EOF.

- Briefings held within the EOF should include the status of what each Manager is working on, rather than just a verbal summary of what has been plotted on the status boards.

- Provisions should be made on a status board for displaying forecast meteorological data and the time period for which the forecast is valid.

e. Radiological Environmental Monitoring Teams

Both teams were dispatched from the TSC after being briefed by the Environs Director. Field kits were checked for completeness and equipment operability as the teams left the station. One respirator was found to have no filter cartridges. The transfer of team control from the TSC to the EOF was very smooth, occurring after a thorough briefing by the TSC Environs Director. The EOF Environs Director showed proper concern for minimizing teams' stay times in the plume and kept the team well advised of meteorological conditions and other changes in scenario events. The teams were sufficiently familiar with the local area and with roadways linking predesignated fixed sampling points. The marker for point A-1 was found to be off its sign post.

Communications were generally satisfactory between the teams and their directors; however, reports were usually difficult to understand when team members spoke while wearing respirators. A two-way radio's batteries failed while a team was offsite. Replacement batteries were available from the field kit. Teams demonstrated proper techniques in taking both open and closed window readings to ascertain their location relative to the plume, and when collecting various air, soil, and vegetation samples. Samples were bagged, stored, and adequately labeled for later identification and analysis.

Based on the above findings, the following items should be considered for improvement:

- The marker for survey point A-1 should be repaired.
- Field kits should include throat microphones or similar devices to reduce radio communications problems when respirators are being worn by field team members.

f. Joint Public Information Center

Although no members of the media were expected at or were actually present during this exercise, the licensee activated the Joint Public Information Center (JPIC). Several controllers, role playing as reporters, aggressively tested the Technical Spokespersons' abilities to provide additional information, to simplify technical responses, and to investigate and refute inaccurate information about scenario events. Spokespersons were generally able to provide satisfactory responses to the questions and effectively utilized available visual aids to help clarify certain responses. On one occasion; however, a spokesperson incorrectly told a role player that a question was irrelevant. News briefings were conducted by several spokespersons at about one hour intervals; however, no supplementary briefings occurred between hourly sessions in response to significant changes in scenario conditions. The RM approved all press releases prior to issuance. Copies of releases were made available to media role players and were posted in the JPIC; however, press releases generally were brief and should have contained more information.

Based on the above findings the following item should be considered for improvement:

- Additional press briefings should supplement periodic briefings on occasions when significant changes occur in between the periodic briefings.

5. Exit Interview

The inspectors held an exit interview at the conclusion of the inspection with licensee representatives denoted in paragraph 1. The licensee agreed to consider the improvement items discussed.

Attachment 1: Dresden Scenario
Narrative Summary and Outline

DRESDEN EXERCISE
June 5, 1984

NARRATIVE SUMMARY

Dresden Unit 2 and 3 are both operating normally at 840 MWe. The DG-2/3 is Out Of Service for Maintenance. There have been ongoing nitrogen additions to the Unit 2 Drywell, which indicate some possible leakage in the Primary Containment.

T = 0 (0800)

The Drywell Floor Drain Sump High Level Alarm activates. This will indicate that there is some minor leakage of coolant into the drywell.

UNUSUAL EVENT T = 20 - T = 60

A Jet Pump failure occurs on Unit 2. This will be indicated by MWe decreases, core flow increases and reactor power decreases. The Tech. Specs. will require the Unit to shut down, and per EAL #3 an Unusual Event will be declared. There will also be indications of a 20-30 gpm leak into the drywell. A portion of the Jet Pump breaks loose and blocks an orifice of one fuel bundle. There is a significant reduction in the coolant flow through the fuel bundle which causes the cladding temperature to increase throughout the Unusual Event.

ALERT T = 60 - T = 135

A crack in the recirc. line causes the leak rate into the Drywell to increase by approximately 50 gpm, which in turn causes the Drywell Pressure to become greater than 2 psig. This will cause the reactor to SCRAM with HPCI being initiated. The Alert will be declared per EAL #11. The failure of the cladding on the fuel bundle causes the containment Rad Levels to increase throughout the Alert.

SITE EMERGENCY T = 135 - T = 210

The Rad Level in containment increases to greater than 400 R/hr. Again, per EAL #11, a Site Emergency will be declared. Also the crack in the recirc line worsens and the leakage rate makes a step increase of 100 gpm. The containment Rad Level will stabilize at approximately 470 R/hr until the General Emergency is reached.

## GENERAL EMERGENCY  T = 210 - T = 450

The recirc. line has a major break causing a severe LOCA. At the same time there is a loss of AC power due to a security vehicle losing control and damaging the 138 KV tower. Also, the LPCI injection will not occur because of suction blockage on the C and D pumps. Due to the loss of power and the DG 2/3 being OOS, the LPCI pumps A and B along with one Core Spray will not be injecting. At this point, there will be only one core spray operating. The core will uncover in about 2 minutes and with only one core spray left cooling the fuel elements, cladding failure will occur. The containment Rad levels will increase to greater than 2000 R/hr. Containment Pressure will start to rise because 4900 gpm of coolant will be flashing to steam.

The containment integrity will be suspect due to the previous information about the nitrogen leakage. There will be some confusing data given on the containment pressure. One gauge will be indicating the correct Drywell pressure and another gauge will be incorrectly indicating 64 psig. A containment temperature will be given that is associated with a containment pressure of greater than 62 psig. The combination of this information should make the loss of primary containment imminent. Especially with the core partially uncovered with no expectation of the coolant level returning quickly. Therefore, per EAL #11, the General Emergency will be declared.

At T = 270 (1230), due to high pressure in the torus, the manway hatch seal fails and a release starts. The release to the environs will be through the Standby Gas Treatment and will last until T = 390.

At T = 360, the power will be restored. This will allow the LPCI and Core Spray to flood the reactor vessel. The Containment Pressure will then start to decrease. At T = 390, the seal on the manway hatch will reseat due to the decreased containment pressure.

## RECOVERY  T = 450 (1530)

A two week time lapse occurs.

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| Initial Situation T = 0 (0800) | 1 | Prior to T = 0(0800) | Control | Sta. Dir./S.E. Recovery Mgr. | Ground Rules |
| | 2 | Prior to T = 0(0800) | Control | Control Room | Plant Status<br><br>Unit 2<br>- 100% Power<br>- Normal Operation<br>- There has been some $N_2$ make up additions.<br>- Drywell Floor Drain Sump is pumped on schedule & indicates some leakage. (1.85 gpm)<br>-D/G 2/3 OOS<br><br>Unit 3<br>- 100% Power<br>- Normal Operations<br><br>Met Data<br><br>Wind Direction 198°<br>Wind Speed 3 m/sec.<br>$\Delta T$ = 1.5 C/100 m |
| | C.I. | T = 0(0800)- T = 195(1115) | C.I. | Control Room TSC | - Reactor Coolant Sample Information |
| | 3 | T = 5(0805) | Control | Control Room | Plant Status<br><br>-Jet Pump Failure indications<br>- MW Decreases<br>- Core Flow indications increases<br>- Reactor Power decreases. |

0366A/1/wjm

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| | 4 | T = 15(0815) | Control | Control Room | Plant Status |
| Unusual Event T=20-T=60 | 5 | T = 20(0820) | Control | Control Room | Completed DOS 202-2 is given out |
| | 6 | T = 25(0825) | Control | Control Room | Plant Status<br><br>Drywell Floor Drain Sump High High Alarms and pump is started. |
| | 7 | T = 30(0830) | Control | Control Room | Plant Status<br><br>- Drywell Floor Drain Sump indicates a 20-30 gpm leak rate<br>- Slight increase in Drywell pressure |
| | 8 | T = 40(0840) | Control | Control Room | Plant Status |
| | 4A | T = 50(0850) | Contingency Message | Shift Engineer SCRE | Declare Unusual Event per EAL #3 |
| | 9 | T = 50(0850) | Control | Control Room | Plant Status<br><br>- Unit 2 will start to be shut down<br><br>Met Data<br><br>- Wind Direction 196°<br>- Wind Speed 3 m/sec $\Delta T = 1.6$ C/100 m |

0366A/2/wjm

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| Alert<br>T = 60 -<br>T = 135 | 10 | T = 60(0900) | Control | Control Room | Plant Status<br>- 2 psig Drywell pressure<br>- Rx SCRAM<br>- A 50 gpm increase in leak rate occurs<br>- HPCI initiates<br>- Group 2 isolation |
| | 11 | T = 70(0910) | Control | Control Room | Plant Status<br>- HPCI Tripped<br>- Rx Pressure decreasing<br>- Feedwater Pumps Tripped |
| | 12 | T = 85(0925) | Control | Con[illegible]ol Room | Plant Status<br>- Containment Rad Level = 5 R/hr<br>- Main steam line HI Rad trip causes Group I isolation<br>Met Data<br>Wind Direction 194°<br>Wind Speed 3 m/sec<br>$\Delta T$ = 1.7 C/100 m |
| | 10A | T = 90(0930) | Contingency Message | Shift Engineer SCRE | - Declar Alert p[illegible] EAL #11 |
| | 13 | T = 100(0940) | Control | Control Room | Plant Status<br>- Containment Rad Level = 70 R/hr |

0366A/3/wjm

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| Alert (cont'd) | 14 | T = 115(0955) | Control | Control Room | Plant Status<br>- Containment Rad Level = 210 R/hr |
| | 15 | T = 125(1005) | Control | Control Room | Plant Status<br>- Containment Rad Level = 370 R/hr |
| Site Emergency T = 135 - T = 210 | 16 | T = 135(1015) | Control | Control Room | Plant Status<br>- Containment Rad Level 450 R/hr<br>- Increasing leak rate.<br>- Increasing D/W pressure.<br>Met Data<br>Wind Direction 191°<br>Wind Speed 3 m/sec<br>ΔT = 1.8 C/100 m<br>-Change in effected Sector(from B to A) |
| | 17 | T = 145(1025) | Control | Control Room | Plant Status<br>- Containment Rad Level = [illegible]0 R/hr<br>- D/W pressure = 9.2 psig. |
| | 18 | T = 160(1040) | Control | Control Room | Plant Status<br>- Containment Rad Level = 465 R/hr |

0366A/4/wjm

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| Site Emergency (cont'd) | 16A | T = 175(1055) | Contingency Message | Control Room | - Declare the Site Emergency per EAL #11 |
| | 19 | T = 175(1055) | Control | Control Room | Plant Status<br>- Containment Rad Level = 470 R/hr<br>Met Data<br>Wind Direction 189°<br>Wind Speed 3 m/sec<br>$\Delta T$ = 1.9 C/100 m |
| | 20 | T = 190(1110) | Control | Control Room | Plant Status<br>- Containment Rad Level = 470 R/hr<br>- D/W pressure = 16 psig. |
| | 21 | T = 205(1125) | Control | Control Room | Plant Status<br>- Containment Rad Level = 470 R/hr<br>- D/W pressure = 19 psig. |

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| GENERAL Emergency T = 210 - T = 450 | 22 | T = 210(1130) | Control | Control Room | Plant Status<br><br>- Major LOCA<br>- Loss of AC Power<br>- Blockage to LPCI pumps C & D.<br><br>- Core uncovering<br>- Rad Levels increasing (≥2000 R/hr.)<br>- Containment Pressure increasing.<br>- Confusing Containment Pressure readings.<br>- Containment Temp. = 308°F<br><br>Met Data<br><br>Wind Direction 187°<br>Wind Speed 3 m/sec<br>ΔT = 2 C/100 m |
| | C.I. | T = 210(1130)- T = 450(1530) | C.I. | Shift Engineer TSC | -Coolant Samples showing major cladding damage (possibly containment air samples) |
| | C.I. | T = 210(1130)- T = 450(1530) | C.I. | Health Physics Team | -Plant Rad Level Information |
| | C.I. | T = 210(1130)- T = 450(1530) | C.I. | Maintenance Teams | - DG 2/3 Information |
| | C.I. | T = 210(1130;- ¯ = 450(1530) | C.I. | Maintenance Teams | - LPCI pump blockage information |

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DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| General Emergency (cont'd) | C.I. | T = 210(1130)- T = 360(1400) | C.I. | Maintenance Teams | - 138 KV Tower information |
| | 23 | T = 215(1135) | Control | Security Dir. | - 138 KV Tower information |
| | 24 | T = 217(1137) | Control | Control Room | Plant Status<br>- Increasing D/W Pressure<br>- Increasing D/W Temp.<br>- Increasing Plant Rad Levels.<br>- Containment Rad Level = $1.6 \times 10^4$ R/hr |
| | 25 | T = 225(1145) | Control | Control Room | Plant Status<br>-Containment Rad Level = $3.2 \times 10^4$ R/hr |
| | 26 | T = 235(1155) | Control | Control Room | Plant Status<br>-Containment Rad Level = $4.3 \times 10^4$ R/hr |
| | 22A | T = 240(1200) | Contingency Message | EOF/TSC | - Declare the General Emergency per EAL #11 |
| | 27 | T = 245(1205) | Control | Control Room | Plant Status<br>-Containment Rad Level = $5.7 \times 10^4$ R/hr<br>Met Data<br>Wind Direction 184°<br>Wind Speed 3 m/sec<br>$\Delta T$ = 2 C/100 m |

DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| General Emergency (cont'd) | 28 | T = 255(1215) | Control | Control Room | Plant Status<br><br>- Containment Rad Level = $6.4 \times 10^4$ R/hr<br>- Inconsistent readings for D/W pressure (31.5 psig and 64 psig). |
| | 29 | T = 270(1230) | Control | Control Room | Plant Status<br><br>- Release Starts up the stack $5 \times 10^5$ uCi/sec<br>- Contaiment Rad level = $7.0 \times 10^4$ R/hr<br><br>Met Data<br><br>Wind Direction 180°<br>Wind Speed 3 m/sec<br>$\Delta T$ = 2 C/100 m |
| | C.I. | T = 270(1230)-<br>T = 450(1530) | C.I. | Environmental Teams | Environmental Radiation Levels |
| | 30 | T = 280(1240) | Control | Control Room | Plant Status<br><br>- Release Rate = $3 \times 10^7$ uCi/sec |
| | 31 | T = 295(1255) | Control | Control Room | Plant Status<br><br>- Release rate = $5 \times 10^8$ uCi/sec |
| | 29A | T = 300(1300) | Contingency | EOF/TSC | - Update the NARS due to the release |

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DRESDEN SCENARIO OUTLINE
June 5, 1984

| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| General Emergency (cont'd) | 32 | T = 310(1310) | Control | Control Room | Plant Status<br>- Release rate = $2 \times 10^8$ uCi/sec<br>Met Data<br>Wind Direction 176°<br>Wind Speed 3 m/sec<br>$\Delta T$ = 2 C/100 m |
| | 33 | T = 325(1325) | Control | Control Room | Plant Status<br>-Release rate = $2 \times 10^7$ uCi/sec |
| | 34 | T = 330(1330) | Control | TSC | -Shift Turnover in TSC begins |
| | 35 | T = 340(1340) | Control | Control Room | Plant Status<br>-Release rate = $2 \times 10^6$ uCi/sec |
| | 36 | T = 355(1355) | Control | Control Room | Plant Status<br>-Release rate = $2 \times 10^5$ uCi/sec |
| | 37 | T = 360(1400) | Control | Control Room | Plant Status<br>- Power is restored.<br>- LPCI & Core Spray flood the reactor vessel.<br>- Release rate = $1 \times 10^5$ uCi/sec |
| | 38 | T = 375(1415) | Control | Control Room | Plant Status<br>- Release rate = $2 \times 10^4$ uCi/sec |

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| PHASE | MSG. NO. | TIME ISSUED | TYPE MESSAGE | ISSUED TO | OUTLINE OF CONTENTS |
|---|---|---|---|---|---|
| General Emergency (cont'd) | 39 | T = 390(1430) | Control | Control Room | Plant Status<br>-Release is terminated<br>Met Data<br>-Wind Direction 173$^{o}$<br>-Wind Speed 3 m/sec<br>$\Delta$ T = 2 C/100 m |
| | 40 | T = 405(1445) | Control | Control Room | Plant Status |
| | 41 | T = 415(1455) | Control | Control Room | Plant Status |
| | 39/ | T = 420(1500) | Contingency Message | EOF/TSC | - Update NARS due termination of the release. |
| | 42 | T = 430(1510) | Control | Control Room | Plant Status |
| | 43 | T = 440(1520) | Control | Control Room | Plant Status |
| | 44 | T = 450(1530) | Control | Control Room TSC/EOF | - One to two week time jump<br>- Recovery<br>- Containment Rad Levels $\leq$ 200 R/hr |
| | 45 | T = 450(1530) | Control | TSC | -Recovery Instructions |
| | 46 | T = 450(1530) | Control | EOF | -Recovery Instructions |

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