U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-440/84-24(DRSS); 50-441/84-22(DRSS)

Docket Nos. 50-440; 50-441 Permit Nos. CPPR-148; CPPR-149

Licensee: Cleveland Electric Illuminating Company
Post Office Box 5000
Cleveland, OH 44101

Facility Name: Perry Nuclear Power Plant

Inspection At: Perry Site, Perry, OH

Inspection Conducted: November 27-30, 1984

Inspectors: W. G. Snell
Team Leader — Date: 12/19/84

T. J. Ploski — Date: 12/18/84

N. R. Williamsen — Date: 12/19/84

Approved By: M. R. Phillips, Chief
Emergency Preparedness Section — Date: 12/18/84

Inspection Summary

Inspection on November 27-30, 1984 (Reports No. 50-440/84-24(DRSS); 50-441/84-22(DRSS))
Areas Inspected: Routine, announced inspection of the Perry Nuclear Power Plant emergency preparedness exercise involving observation by 13 NRC representatives of key functions and locations during the exercise. The inspection involved 230 inspector-hours onsite by nine inspectors and four consultants.
Results: Although no items of noncompliance, deficiencies, or deviations were identified, seven exercise weaknesses were identified and are summarized in the Appendix.

DETAILS

1. Persons Contacted

a. NRC Observers and Areas Observed

P. Brown, Control Room
W. Snell, Control Room, Emergency Operations Facility (EOF)
M. Phillips, Control Room, EOF, Medical Drill
T. Ploski, Technical Support Center (TSC)
N. Williamsen, Operational Support Center (OSC), TSC, Inplant Teams, Post Accident Sampling
W. Hanson, TSC
T. Essig, OSC, Inplant Teams, Post Accident Sampling
J. Grobe, Control Room, TSC, EOF
G. O'Dwyer, Control Room, TSC, EOF
D. Perrotti, EOF
J. Steffano, EOF, Joint Public Information Center (JPIC)
M. Blauer, Offsite Radiological Monitoring Teams
R. Marabito, JPIC

b. Cleveland Electric Illuminating Company

M. Edelman, Vice President, Nuclear Group
D. Hulbert, Emergency Planning Coordinator
W. Coleman, General Superintendent, Community Relations
R. Farrell, Manager, Perry Project Services
A. Okorn, Shift Supervisor
J. Wack, Nuclear Quality
E. Traverso, Chemistry Supervisor
R. Cochnar, Radiation Protection Analyst
J. Murray, Administrative Supervisor
T. Calkins, Unit Supervisor
R. Stiffler, Shift Supervisor
K. Russell, Shift Supervisor
W. Kanda, Jr., Plant Technical Engineer
A. Kaplan, Vice President, Nuclear Operation Division
F. Kearruy, Operator Training Unit
J. Anderson, Emergency Planning Assistant
D. Geisweidt, Supervisor, Information Control
J. Waldron, Manager
G. Heffner, CEI Public Affairs
E. Shaw, Public Affairs
T. Schneider, Public Affairs
B. Ferrell, Licensing Engineer
L. Beck, Licensing
E. Buccelli, Licensing
K. Novak, Security
A. Dunn, Security
R. DeChant, Public Affairs

G. Ankney, PPSD
J. Smircina, CEI Governmental Affairs
S. Kensicki, Radiation Protection
D. Reyes, Radiation Protection/Chemistry
F. Stead, Manager, NED
D. Takacs, General Superintendent, Maintenance
M. Lyster, Manager, PPOD
R. Tadyeh, General Superintendent, Operations
W. Rodehorst, Lead Controller, JPIC
S. Goldman, Lead Controller, EOF
T. Kevern, Lead Onsite Contoller, Control Room
S. Reilly, Controller, TSC
D. Andrews, Lead Controller, OSC
D. Loope, Controller, Inplant Teams
C. Crowe, Controller, EOF
S. Danielson, Lead Controller, TSC

The personnel listed above attended the exit interview on November 29, 1984.

2. General

An exercise of the Perry Nuclear Power Plant Emergency Plan was conducted at the Perry Nuclear Power Plant on November 28, 1984. The exercise tested the applicant's and offsite emergency support organizations' capabilities to respond to a simulated accident scenario resulting in a major radioactive release. Attachment 1 describes the scenario. The exercise was integrated with a test of the State of Ohio, State of Pennsylvania, Lake County, Geauga County and Ashtabula County Emergency Plans. This was a full-participation exercise for these counties and the State of Ohio. Pennsylvania participation was limited to the ingestion pathway.

3. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the Perry Nuclear Power Plant Emergency Plan and related Emergency Planning Instructions.

b. Coordination

The applicant's response was generally coordinated, orderly, and timely. Had these events been real, actions taken by the applicant would have been sufficient to permit State and local authorities to take appropriate actions to protect the public's health and safety.

c. Observers

The applicant's observers monitored and critiqued this exercise along with 13 NRC observers and a number of Federal Emergency Management Agency (FEMA) observers. FEMA observations on the responses of State and local governments will be provided in a separate report.

d. Exercise Critiques

The applicant held critiques following the exercise on November 28 and November 29, 1984. The NRC held a critique following the applicant's critique on November 29, 1984. The NRC and the applicant identified weaknesses in their respective critiques. Weaknesses identified by the NRC are provided in the text of this report. In addition, a public critique was held in the Performing Arts Center at the Lakeland Community College, Kirkland, Ohio, on November 30, 1984, to present the preliminary onsite and offsite findings of the NRC and FEMA exercise observers respectively.

4. Specific Observations

a. Control Room

The Control Room personnel demonstrated a good knowledge of the Emergency Planning Instructions. Assessment of events and subsequent corrective actions taken by the staff were good. The classifications of the Unusual Event and Alert were both appropriate and timely with the notifications to all offsite authorities made within the required 15 minutes.

Communications between the Control Room and the Secondary Alarm Station (SAS), which is located in the Control Room, and other locations and facilities such as the Technical Support Center (TSC), Central Alarm Station (CAS), inplant medical team, local counties, State of Ohio, Coast Guard, and NRC were formal and very well conducted. At no time was confusion observed to be introduced as a result of poor communications, even though the 5-way line did not work between the facility and Geauga County. In addition, the method of using prerecorded messages for shift augmentation appeared to be well thought out and was efficiently executed.

Logkeeping for recording all events and communications in the Control Room was very good. In addition, the transfer of command and control to the TSC, when activated, was implemented in a smooth and timely fashion.

The Shift Technical Advisor (STA) appeared to not be as well utilized as he could have been based on his intended role as outlined in the Emergency Planning Instructions (EPIs). According to the EPIs, the STA was to provide technical and analytical support in the diagnosis of off-normal events. During the exercise, the STA was delegated the responsibility to monitor offsite notification and all communications. Although the STA was on hand for these purposes during non-reactor accident events (e.g., fire, injury), during reactor-type events, he should have been free to perform his primary duties. In that the notification procedures appeared to be well thought out and appeared to operate smoothly, these responsibilities should have been delegated to another trained assistant during reactor-safety threatening events.

The Shift Supervisor appeared to spend too much time on administrative duties such as plant public address announcements and filling out forms. His time could be better utilized if some of these responsibilities were delegated to someone else. This would have been especially important when considering that most of these duties could have been implemented during times of greatest activity.

The physical layout of the Control Room made it necessary for the Shift Supervisor to leave the control portion of the Control Room to consult with SAS. Communications between the Shift Supervisor and SAS could be improved had a two-way voice system been available which would have eliminated the need for the Shift Supervisor to leave the control area.

b. Technical Support Center (TSC)

The staffing and activation of the TSC was fast and efficient and was completed within a 30-minute time frame. The assumption of command and control from the Control Room and the subsequent relay of command and control to the EOF was timely and was well implemented. The Site Area Emergency declaration was appropriate and timely, with offsite notifications being implemented within a 15-minute time frame. The content and completion of these notifications were adequately documented.

Logkeeping and administrative support in the TSC were good. Staff briefings by the Operations Manager were frequent and were sufficiently detailed.

Status boards were generally adequate and were kept up-to-date. However, it would have been helpful if the status boards had contained information on appropriate plant equipment such as pumps, valves, and electrical equipment that were out-of-service, or were under repair.

From the standpoint of providing technical support, the TSC did a good job. Examples were as follows: concentrating on how to lower the stuck fuel bundle rather than raise the spent fuel pool water level; requesting containment air and liquid samples after the containment radiation levels had risen; and, deciding not to turn off the Annulus Exhaust Gas Treatment System (AEGTS), Train B, so the release would be somewhat filtered and could be monitored. The one notable exception was that the TSC appeared to be content to let the Control Room alone concentrate on the problem of the control rods failing to insert for the first several hours after the problem occurred.

The TSC effectively utilized an Information Liaison position as part of the TSC staff to handle press releases and news media inquiries prior to the activation of the Emergency Operations Facility (EOF). All press releases generated by the Information Liaison individual were reviewed and subsequently approved by the Emergency Coordinator/ Operations Manager prior to their release.

The dedicated telephone line used for notification of the State and counties was found to be inoperable upon activation of the TSC. The TSC did a good job of getting this problem corrected expediently rather than being content to rely on commercial telephone lines or letting the Control Room handle the initial notifications.

A lack of good communications between the TSC and Control Room was observed. It resulted in confusion and in conflict of action in the TSC. For example, the Control Room followed procedures to lower the water level in the reactor vessel without informing the TSC. This resulted in the TSC thinking that the water level had dropped because of a leak. Communications between the TSC and EOF were, by far, too dependent upon the TSC Operations Manager and the Emergency Coordinator in the EOF. More communication between counterparts and between staff members of each facility would have helped with information flow regarding problem solving.

Some plant actions were taken which were not covered by operating procedures. Some of these actions may have been inappropriate. For example, the dispatch of personnel into the containment building to check the Standby Liquid Control System (SLC) valve alignment with rapidly rising containment temperature prior to having checked all possible external causes of the failure of the SLC to inject; and, the attempt to create additional voiding in the core by adjusting the level and pressure beyond the values authorized in procedure PEI-1, Attachment 5. In addition, documentation was not generated when deviating from standard plant procedures. Procedure deviations should be documented, and if time permits, these deviations should be reviewed and approved by appropriate personnel before the deviations are implemented. This will be tracked under Open Item Nos. 440/84-24-01; 441/84-22-01.

Although the TSC staff was well aware of high radiation levels in the drywell and containment, radiation levels in the Annulus Exhaust, Train F, and the Unit 2 Vent Stack were not closely monitored or trended. Radiation levels in the AEGTS, Train B, and Unit 2 Vent began increasing from less than 100 cpm at 1215 to greater than 10^6 by 1315, but the Operations Manager did not learn of this until 1318 following a telephone communication from the EOF. Basically, the TSC staff missed the fact that the release had started 45 minutes earlier. A review should be made of the TSC activities during this time to determine why this information had been missed, thus ensuring better response in the future. This will be tracked under Open Item Nos. 440/84-24-02; 441/84-22-02.

Although the Unit 2 Vent Stack flowrate was available from the MIDAS computer system, the TSC staff never used MIDAS to obtain this information, although they debated the merits of venting the containment to reduce its pressure. It wasn't until approximately two hours after the release had begun that the TSC obtained the stack flowrate from the EOF.

The TSC staff conducted a good preliminary discussion of short and long-term recovery concerns at the end of the exercise.

c. Operational Support Center (OSC)/Inplant Teams

OSC personnel handled their supporting roles well. They were activated within approximately 30 minutes and did an effective job of anticipating TSC requests for support, enabling the OSC to efficiently utilize personnel.

All plant status briefings conducted in the TSC were announced in the OSC, which was a very efficacious means of keeping OSC personnel informed of emergency events. The key events status board in the OSC was updated in a very timely manner by an individual assigned to that task. This status board was useful in that it contained key information relative to the status of various inplant teams.

The OSC did a good job of considering the exposures of individuals before and during the implementing of assigned inplant tasks. Radiation exposures received by plant repair, maintenance, and health physics teams were continuously tracked throughout the exercise. Although an excellent job was done of reporting and maintaining area radiation levels throughout the plant on a plant layout map in the OSC, the times at which the readings were obtained were not posted with the readings. Since under accident conditions these readings could be changing significantly over short periods of time, provisions should be made to record the times at which the readings are taken along with the readings.

Observation of the inplant teams showed that they were generally well trained and knowledgeable of their duties and responsibilities. Some exceptions to this were the following: not all survey instruments were given an operational test before use; an air sample and some smears were collected in the Fuel Handling Building and were brought directly to the Health Physics Office without adequately determining the radiation levels associated with these samples first; and, the chemistry technician was neither informed of, nor attempted to determine the radiation levels associated with the transport and subsequent laboratory analysis of the post-accident coolant and offgas samples, even though these levels had been measured earlier by the team which collected these samples.

The staging and simulation of the fire drill was excellent. The fire brigade arrived quickly and was adequately equipped and staffed to fight the fire. Assistance from the Perry Township Fire Department was appropriately requested. Upon arrival, this organization effectively supplemented the plant fire brigade's efforts.

d. Medical Drill

The Control Room was notified of the contamination injury at 0915. Although there was some initial confusion regarding the location of the injured person, the first aid team arrived at the scene with a stretcher within four minutes. This team initially consisted of two Security personnel trained in first aid practices, and two radiation monitoring technicians. Administration of first aid began within two

minutes of the team's arrival at the scene. Although vital signs were not obtained, first aid team members continually ascertained that the injured individual was alert, oriented, and warm. A contamination control perimeter was promptly established, and team members ensured that cross-contamination did not occur outside the area. Ambulance assistance was requested at 0927, and ambulance team members arrived at the scene at 0948. Radiation monitoring at the scene was adequate. Radiation levels and contamination levels were determined, and appropriate actions were taken. Personnel exiting the scene demonstrated appropriate contamination control procedures. First aid versus decontamination priorities were properly established. Although ambulance personnel arrived at the scene wearing paper coverall protective clothing, additional protective clothing was donned since the paper coveralls ripped when one of the attendants bent over. The ambulance personnel and one of the radiation monitoring technicians left the scene with the injured individual shortly after 1000. The ambulance arrived at the Lake County East Hospital at 1030. Prior to the ambulance arrival, hospital maintenance personnel had set up the treatment area using part of the associated hallway and driveway, and part of the emergency room, with protective floor coverings. Hospital treatment personnel were properly dressed in protective clothing. On both sides of the treatment area, guidelines were posted which established an outline for the treatment, decontamination, and transfer of the patient from the treatment area. An additional radiation monitoring technician arrived at the hospital shortly before the arrival of the ambulance. Contamination control practices at the hospital were excellent. Communications between the hospital, ambulance, and Perry plant were adequate, since the hospital treatment personnel were aware of the nature of the injuries and location and levels of contamination prior to the arrival of the injured individual. Hospital personnel appropriately determined the priorities between decontamination and treatment of the injuries. Survey techniques inside and outside of the treatment area were good. All equipment and floor coverings as well as the ambulance were surveyed. Hospital personnel demonstrated excellent recordkeeping regarding the initial History and Physical Exam, and the results and location of residual contamination after each washing. Personnel exit procedures were followed demonstrating good techniques for avoiding any cross-contamination. Although hospital personnel wore 500 mR range dosimeters, they were never checked during the exercise since the radiation and contamination levels were so low. During the exercise, press photographers were allowed to photograph the patient while treatment was provided in the treatment area. This practice should be reexamined since it may violate Privacy Act restrictions regarding patient anonymity.

e. Emergency Operations Facility (EOF)

The EOF was activated well within one hour after the declaration of the Site Area Emergency with a smooth and obvious transfer of command and control from the TSC. Plant status briefings to the EOF staff by the Emergency Coordinator were timely, thorough, and accurate. Overall direction and control of the emergency response activities from the EOF were handled well.

The General Emergency classification was timely and well thought out, with the subsequent notifications to offsite authorities completed within 15 minutes. All press releases were reviewed and approved by the Emergency Coordinator prior to their release as required by procedure EPI-A8. Emergency Planning Instructions were available and were used by EOF personnel.

Logkeeping in the EOF was generally complete; however, only three log entries were noted in the Offsite Radiation Advisor's logbook at the conclusion of the exercise. In addition, since logkeeping was the only method used to record field monitoring data, it was difficult to efficiently use the data for plume identification for personnel newly arrived at the EOF. A more effective use of the data could have been made if the actual field readings and the times they were obtained had been plotted on a map of the site and surrounding areas. This will be tracked under Open Item Nos. 440/84-24-03; 441/84-22-03 and will be observed during the next exercise.

Access control to the EOF was excellent, and included the checking of items coming into the EOF for potential contamination. Although TLDs were issued to all personnel, there was no verification that personnel knew how to properly wear them. Two individuals were noted to be wearing their TLDs incorrectly (still inside the plastic bag). Although these individuals were stopped soon after arriving in the EOF and instructed on how to wear a TLD, it would be better to implement this instruction at the time the TLD is issued.

Status boards were effectively used and were kept up-to-date throughout the exercise. However, protective actions implemented by the State of Ohio were poorly displayed in the EOF. The status board was confusing in describing what protective actions were recommended versus those that had actually been implemented.

The EOF effectively controlled the Radiological Monitoring Teams (RMTs) to obtain offsite radiological readings. The EOF also kept the RMTs informed of changing plant and meteorological conditions.

The coordination and integration of plant operations information into the dose assessment calculations was weak. The staff could have been more aggressive in determining and utilizing projected release durations and projected release levels. All assessments were observed to consider only a default release duration of six hours, including a dose assessment calculation as late as 1404. By this time, a six-hour release was not reasonable considering SLC was injecting by 1324 and containment pressure was dropping by 1340. In another instance, the EOF began discussions on venting the containment at 1238, but actual dose calculations were not made until 1310, which assumed 100 percent of containment inventory would be released. This time lag between discussion and calculation was unnecessarily long, and a realistic assessment based on projected releases from venting should have been conducted.

Procedures and training should be reviewed to ensure adequate emphasis is placed on determining protective action recommendations based on projected plant conditions, projected release durations and projected magnitudes of releases. This will be tracked under Open Item Nos. 440/84-24-04; 441/84-22-04 and will be examined during the next exercise.

Although no problems or confusion were observed during this exercise on this issue, the NRC believes the applicant should better coordinate protective action recommendations with the State of Ohio and surrounding counties. The State and counties use subareas for implementation of protective actions that essentially jump in increments from two, to five, to ten miles. However, the applicant makes its protective action recommendations based on one-mile increments. On two occasion, this resulted in the applicant upgrading their recommendation for sheltering and evacuation into areas for which offsite authorities had already implemented sheltering or evacuation. This served little useful purpose, and may cause confusion. This coordination of protective action decisions will be tracked under Open Item Nos. 440/84-24-05; 441/84-22-05.

The follow-up notification form used to update the State and counties on plant information contained a section for providing radiological field monitoring data. However, this part of the form was always marked as "data not available", even after the data became available. In addition, the EOF was not actively requesting, comparing, or utilizing radiological field monitoring data from the State of Ohio, even though the State of Ohio was obtaining this data from the EOF staff. This will be tracked under Open Item Nos. 440/84-24-06; 441/84-22-06 and will be examined during the next exercise.

f. Offsite Radiological Monitoring Teams (RMTs)

The first two RMTs arrived at their staging area in the Training Center Building 12 minutes after the Alert was declared. Although the staging area room appeared to function adequately, it was small, crowded, and did not contain any chairs. Consideration should be given to upgrading this facility.

Upon arrival at the Training Center Building, the teams appropriately checked their field kits, radios, and procedures. Observation of the teams in the field showed that they were well trained and knowledgeable of their duties and responsibilities. Teams demonstrated good techniques when obtaining air samples, such as wearing gloves and bagging samples. The RMTs were aware of and implemented good ALARA practices.

g. Joint Public Information Center (JPIC)

The JPIC facilities, equipment, and procedures for rumor control, media inquiries by telephone, and the approval and issuance of press releases were more than adequate. Security to allow only authorized personnel and news media into the facility was good.

The number of press briefings held during the exercise was adequate and well above average when compared to other facilities. With varying degrees of success, the applicant's technical spokesperson tried diligently to explain the situation in non-technical terms. In general, the reporters and attendees appeared satisfied with the information and explanations. In the future, it would be best to avoid terms like "blowdown", "EDS", "trains", and other technical language while concentrating more on what these systems or components are designed to do.

Press releases were generally issued in a timely manner and provided pertinent information. However, a major lapse involved notifying the news media of the airborne release of radioactivity. The release began at 1230, but the media was not informed until 1445. The applicant should examine this lack of timeliness in notifying the news media of this information and, if necessary, should make procedural changes to ensure that these types of delays will not occur in the future. This will be tracked under Open Item Nos. 440/84-24-07; 441/84-22-07.

h Scenario

The scenario for this exercise was very good from a technical standpoint and it challenged the abilities of all the exercise participants. The scenario anticipated accurately most player actions which enabled it to stay on schedule with little controller intervention. The extensive amount of plant operational, inplant radiation, and offsite radiation data resulted in a smooth running exercise that minimized the amount of controller improvisation. Control and staging of the exercise was excellent with no controller prompting observed.

5. Exit Interview

The inspectors held an exit interview the day after the exercise on November 29, 1984, with the applicant's representatives denoted in Section 1. The NRC team leader discussed the scope and findings of the inspection. Applicant representatives stated that they would address the NRC concerns.

Attachment: Perry Exercise Scenario

PERRY NUCLEAR POWER PLANT
1984 EMERGENCY PREPAREDNESS EXERCISE

INITIALS CONDITIONS GIVEN TO PLAYERS ON NOVEMBER 27

1. Unit 1 reactor is operating at 100 percent power. The unit has been operating continuously and has had a capacity factor of over 90 percent since the last refueling outage 17 months ago.

2. Emergency Service Water Pump P45-C001A failed to meet its discharge pressure inservice inspection (ISI) at 2200 on November 25. The pump is disassembled and is expected to be placed back in service in about 24 hours. The following Division 1 Lineup has been established in the daily instructions for the duration of P45-C001A unavailability: RHR Pump A and LPCS Pump Breakers are racked in but are not to be used except if Divisions 2 and 3 are inoperable. RCIC use is allowed but should be limited to a backup to High Pressure Core Spray. Division 1 Diesel Generator is out of service with its output Breaker racked out and is not to be used. Emergency Closed Cooling Pump P42-C001A Breaker is also racked out; ECC Pump A is not to be used until the return of ESW Pump P45-C001A.

3. Preparations continue to ready spent fuel element for shipment to Idaho National Engineering Laboratories to undergo examination and testing of the new barrier fuel cladding.

4. Annulus Exhaust Gas Treatment System, Train A, is in day two of a seven day Limiting Condition for Operation due to a motor failure on Fan M15-C001A. The fan is disassembled awaiting a new motor. Train B is in service.

5. All other systems are operable.

6. Unit 2 remains under construction; no significant activities are scheduled for today.

7. General Electric Company personnel will be onsite Friday to talk with Maintenance and Technical Section staff concerning:

   a. Intergranular stress corrosion cracking. (IGSCC)

   b. New control rod drive seal performance.

   c. Support for the Spent Fuel Element shipment.

8. Current weather conditions are as follows:

Wind speed:	10 miles per hour [measured on the 10 meter level]
Wind direction:	185°
Temperature:	35°F

Tomorrow's forecast calls for sunny and clear but cold weather. Winds will be out of the north-northwest at 10-20 miles per hour for most of the day. High temperatures in the low 40's are expected.

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9. Current weather conditions are as follows:

Wind speed:	20 miles per hour [measured on the 10 meter level].
Wind direction:	200°
Temperature:	32°F

Today's forecast calls for sunny and clear but cold weather. Winds will be out of the north-northwest at 10-20 miles per hour for most of the day. High temperatures in the low 40's are expected.

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PERRY NUCLEAR POWER PLANT
1984 EMERGENCY PREPAREDNESS EXERCISE

INITIAL CONDITIONS

1. Unit 1 reactor is operating at 100 percent power. The unit has been operating continuously and has had a capacity factor of over 90 percent since the last refueling outage 17 months ago.

2. Emergency Service Water Pump P45-C001A failed to meet its discharge pressure inservice inspection (ISI) at 2200 on November 25. The pump is disassembled and is expected to be placed back in service in about eight hours. The following Division 1 Lineup has been established in the daily instructions for the duration of P45-C001A unavailability: RHR Pump A and LPCS Pump Breakers are racked in but are not to be used except if Divisions 2 and 3 are inoperable. RCIC use is allowed but should be limited to a backup to High Pressure Core Spray. Division 1 Diesel Generator is out of service with its output Breaker racked out and is not to be used. Emergency Closed Cooling Pump P42-C001A Breaker is also racked out; ECC Pump A is not to be used until the return of ESW Pump P45-C001A.

3. A spent fuel element is being readied for shipment to Idaho National Engineering Laboratories for examination and testing of the new barrier fuel cladding.

4. Annulus Exhaust Gas Treatment System, Train A, is in day three of a seven day Limiting Condition for Operation due to a motor failure on Fan M15-C001A. The fan is disassembled awaiting a new motor. Train B is in service.

5. Backwashing of Fuel Pool Cooling and Cleanup Demineralizers is set to begin at 0900.

6. All other systems are operable.

7. Unit 2 remains under construction; no significant activities are scheduled for today.

8. General Electric Company personnel will be onsite tomorrow to talk with Maintenance and Technical Section staff concerning:

   a. Intergranular stress corrosion cracking. (IGSCC)

   b. New control rod drive seal performance.

   c. Support for the Spent Fuel Element shipment.

PERRY NUCLEAR POWER PLANT
1984 EMERGENCY PREPAREDNESS EXERCISE

NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
0700	Initial conditions are established. Commence exercise.
0708	A fire breaks out in the PPD machine shop.
0710	The Control Room is notified of the fire; the fire brigade is dispatched.
0715	The Fire Brigade arrives at the scene. The fire is spreading. The Fire Brigade Leader requests offsite fire fighting assistance.
0717	The Shift Supervisor calls for offsite fire fighting assistance.
0725	The Shift Supervisor declares an UNUSUAL EVENT. (EPI-A1, Section F.I.1, "Fire within the Protected Area lasting greater than 10 minutes").
0725	Offsite fire fighting assistance arrives at the Primary Access Control Point Gate, and is escorted to the scene of the fire.
0745	The fire is extinguished.
0755	A spent fuel element is being raised in the Spent Fuel Pool for loading into the Spent Fuel Transportation Cask.
0800	Offsite fire fighting assistance leaves the site.
0800	The refueling bridge winch position interlock fails as the bundle is raised to the overhoist position. Fuel Handling Building area radiation monitors alarm locally and in the Control Room. The bundle cannot be lowered using the winch due to the failure of a fuse in the brake release power

PERRY NUCLEAR POWER PLANT
1984 EMERGENCY PREPAREDNESS EXERCISE

NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
0805	The Shift Supervisor declares an ALERT (EPI-A1, Section J.II.1, "Fuel handling accident with release of radioactivity to Containment or Fuel Handling Building"). The TSC and OSC are activated. Onsite monitoring teams are dispatched.
0900	The TSC and OSC are fully activated.
0915	An operator on rounds in the intermediate building notices water coming from inside the Fuel Pool Cooling and Cleanup Backwash Receiving Tank Room. He slips and falls on a puddle of water, gashes his head and breaks his upper left arm. He radios for help. (The leak is from a flanged connection on a valve upstream of the pump.)
0920	Security dispatches a First Aid Team to treat the injured victim.
0930	An offsite ambulance should be requested for the injured individual.
0940	The offsite ambulance arrives at the Primary Access Control Point Gate.
0955	The victim is loaded into the ambulance.
1000	The ambulance leaves the site. Intermediate Building decontamination and re-entry operations continue.
1000	Safety-Relief Valve (SRV) B21-F051D inadvertently opens. The operators make preparations for a fast reactor shutdown.
1002	A scram is attempted by placing the mode switch in "SHUTDOWN": however, there is no inward motion of the control rods. In accordance with PEI-1, the operators attempt to shutdown the reactor using alternate rod insertion. All alternate shutdown methods fail. A manual scram is attempted, but fails.

PERRY NUCLEAR POWER PLANT
1984 EMERGENCY PREPAREDNESS EXERCISE

NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
1015	The Suppression Pool temperature reaches 110°F. Standby Liquid Control is activated, but the common check valve C41-F007 does not open, and SLC does not inject. The operators implement PEI-1, Attachment 5, to lower reactor level. Level will reach approximately -145 inches in 30 minutes and power will be approximately 8%. Control Complex ventilation shifts to recirculation mode
1030	A SITE AREA EMERGENCY is declared. (EPI-A1, Section D.III.2, "Complete loss of any functions needed for plant hot shutdown").
1050	Reactor water level is being maintained at -145 inches; reactor power remains at 8%.
1100	The EOF and JPIC are being activated.
1115	Suppression Pool temperature reaches a peak of 143°F and remains steady.
1120	All upper pool dump valves fail to open automatically. Both trains fail due to a hydraucic lock that exists between the dump valves due to a failure of check valves G43-F508A and G43-F508B. Any effort to open these valves fails.
1130	Reactor power remains steady at 8% power. All efforts to insert the control rods continue to fail.
1155	SRV B21-F051D closes; Suppression Pool Temperature begins to decrease.
1200	The Turbine Driven Reactor Feed Pump and Feedwater Booster Pump trip due to Surge Tank Low Level Switch N21-N335 malfunction; the entire feedwater system is rendered unavailable. When Reactor water level decreases below -148 inches, an MSIV isolation is initiated.
1201	RCIC is placed in service, but reactor water level continues to decrease to seven inches above the top of active fuel.

PERRY NUCLEAR POWER PLANT
1984 EMERGENCY PREPAREDNESS EXERCISE

NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
1202	The reactor is being depressurized to the suppression pool by the operators via the safety relief valves (SRVs) in accordance with PEI-1, Attachment 5. Containment Building Area Radiation Monitors alarm. The Reactor Core is uncovered.
1204	Reactor water decreases to 43 inches below the top of the active fuel.
1206	In accordance with PEI-1, Attachment 5, Step 7, the operators direct jumpers to be installed in Panel H13-P618 in order to use RHR B to regain reactor water level. The I&C Technician inadvertently shorts out the Division 2 RHR LOCA logic which realigns RHR B and C in the LPCI mode. When the sparks arc, he slips and damages the LPCI B Injection Valve Manual Override Relay E12-K24B in the de-energized mode. The Reactor Vessel begins to flood rapidly. RHR (LPCI) Pumps B and C are injecting cold water into the vessel at the combined flow rate of 14,000 gpm. Reactor Vessel level peaks at +5 inches Wide Range. Reactor power peaks at 55% and decreases to 40%.
1208	The operators close LPCI-C injection valve, but efforts to close the LPCI-B injection valve fail. Further, when the LPCI B pump control switch is placed in the "Stop" position, the Breaker Trip Control Power Fuse blows, thus allowing the pump to run. The pump cannot be tripped from the Control Room. Reactor power decreases to 20%.
1210	Suppression Pool temperature increases approaching 212°F. Containment radiation levels increase.

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NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
1215	An operator successfully opens RHR Pump B breaker locally (Elevation 620 Control Complex). As he completes the task, he becomes aware of the scent of charred paint and metal. Upon investigation, he discovers the Motor Control Cabinet for Bypass Valve E12-F048B is charred and inoperable. Bypass Valve E12-F048B is stuck open.
1220	A GENERAL EMERGENCY is declared (EPI-A1, Section D.IV.1, "Loss of two fission-product barriers with a potential loss of a third" or Attachment 3, Condition 2, "Transient plus failure of requisite core shutdown systems. Could lead to core melt in several hours with containment failure likely. More severe consequences if reactor Recirculation Pump Trip does not function").
1230	Suppression Pool temperature reaches 224°F; containment pressure is 5 psig and increasing. RHR B is being used for containment spray, but RHR Heat Exchanger Bypass Valve E12-F048B is open, rendering the spray ineffective due to lack of cooling. HPCS is maintaining water level. Annulus Exhaust Gas Treatment System (AEGTS) and the Unit 2 vent monitor detect increasing levels of radiation.
1245	Containment pressure and temperature continue to increase. Suppression Pool temperature is 238°F; containment pressure is 10 psig and increasing.

PERRY NUCLEAR POWER PLANT
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NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
1315	Containment pressure reaches 27 psig. AEGTS and the Unit 2 vent monitor indicate substantially increased levels to radiation. Offsite radiological monitoring teams detect increases in radiation readings.
	NOTE: A release path from the containment to the annulus is available through a crack in the containment dome-to-wall circumferential weld. From the annulus, the radioactive gas is released through the AEGTS. The operators should not turn off the AEGTS fan; if they do, the extreme annulus-to-atmosphere pressure could leak out unmonitored and unfiltered. Also, the fire dampers do not shut due to a batch of defective fusible links.
1315	Standby Liquid Control System injects into the vessel when Common Check Valve C41-F007 opens.
1325	Containment pressure peaks at 28 psig.
1330	RHR Bypass Valve E12-F048B is closed; Containment Spray Loop B is in full operation.
1335	Maintenance reports that ESW Pump P45-C001A will be able to be racked in at 1340; final coupling alignments are in progress.
1340	ESW Pump P45-C001A is started; Containment Spray Loop A is placed in operation.
1400	Some control rods begin to insert due to spurious rod drifts.
1410	The Reactor is shut down due to completion of SLC injection.
1430	Containment pressure decreases. The release decreases.

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NARRATIVE SUMMARY - ONSITE SEQUENCE OF EVENTS

Approximate Time	Key Event
1445	The Shift Supervisor reports that all control rods have inserted.
1500	Containment pressure returns to atmospheric pressure. The release stops.
1545	Offsite radiation readings begin to decrease as wind speed and direction changes disperse the plume.
1615	Offsite radiation readings return to background. The GENERAL EMERGENCY is downgraded. Commence re-entry and recovery operations.
1645	The exercise is terminated.

6.4 Written Summary of The Exercise Scenario

NOTE: The following is a synopsis of the detailed narrative summary listed in Section 6.2 of this package.

The Perry Nuclear Power Plant has been operating continuously for the last 17 months with a capacity factor of over 90 percent. The Plant is currently operating at 100 percent power and is at the end of core life. Some equipment problems are ongoing but all have been addressed through surveillance activities. Plans are currently underway to ship one fuel element to Idaho National Engineering Laboratories for examination and testing on the new barrier fuel cladding.

Weather conditions remain constant with the forecast indicating a high temperature of 45°F for the day with winds out of the Northwest at 10 to 20 miles per hour.

At 7:08 a.m. a fire breaks out in the PPD machine shop on Level 599'. The Control Room is notified to activite the Station Fire Brigade. Upon arrival at the scene, fire fighting operations commence and a request is made for offsite fire fighting assistance due to the severe nature of the fire.

Based on this situation, at 7:25 a.m. the Shift Supervisor declares an Unusual Event in accordance with EPI-A1, Section F. I. 1 ("Fire within the Protected Area lasting greater than 10 minutes"). Notifications are begun to offsite authorities and the Nuclear Regulatory Commission.

A short while later offsite fire support arrives at the Plant and the fire is extinguished at approximately 7:45 a.m. Initial indications are that the fire has not affected any Plant safety systems and a decision is made to leave the Plant at full power.

Plant personnel begin damage assessment activities and preliminary reports indicate that no one was injured as a result of the fire.

At 8:00 a.m. a spent fuel bundle is raised beyond the normal up limit due to a winch interlock failure on the Spent Fuel Handling Bridge in the Fuel Handling Building. This action results in the initiation of radiation alarms locally and in the Control Room.

The Fuel Handling Building is evacuated, and the Control Room is notified of the situation. Based on EPI-A1, Section J. II. 1 ("Fuel handling accident with release of radioactivity to containment or Fuel Handling Building") the Shift Supervisor escalates the emergency classification to an Alert, and notifications are made to required personnel and offsite agencies. The Technical Support Center and Operations Support Center being activation and other emergency response personnel go on standby. Local Emergency Operations Centers begin notifications and remain in a standby mode.

Plant assessment activities continue onsite with reports coming in from the work crews who are re-entering the Fuel Handling Building.

At 9:15 a.m. an operator on rounds in the Intermediate Building notices water coming from the Fuel Pool Cooling and Cleanup Backwash Receiving Tank Room. While attempting to leave the area, he slips, falls and is seriously injured. Later indications will show that he is also contaminated by the leaking water. The Plant First Aid Team responds while notifications are made offsite for ambulance support.

Lake County Memorial East Hospital is notified to prepare for receipt of a contaminated, injured man.

Plant conditions remain stable and final reports indicate no serious damage resulted from the fire. Repair activities are begun in the Spent Fuel Pool Area to return the bundle to safe storage.

At 10:00 a.m. Safety Relief Valve (SRV) B21-F051D inadvertently opens and operators prepare to commence a reactor shutdown. During the scram initiation no control rod motion is observed. All alternate attempts to shutdown fail, resulting in an ATWS (Anticipatory Transient Without Scram).

The Operations Manager in the Technical Support Center declares a Site Area Emergency based on EPI-A1, Section D.III. 2 ("Complete loss of any functions needed for plant hot shutdown"). Offsite notifications are made. The Emergency Operations Facility and Joint Public Information Center are activated. State and Local Emergency Operation Centers are also activated.

Operators' attempts to manually scram the reactor continue to fail; and the Standby Liquid Control System fails to initiate upon demand.

Due to these failures, the Control Room Operators implement Attachment 5 of PEI-1 to lower reactor water level and reduce reactor power to approximately 8% through void formation. Efforts to insert the control rods or initiate boron poisoning continue to fail.

At 12:00 p.m. the reactor's water level is being maintained by only one feed pump. A short time later the running feedwater booster pumps and the running feed pump trip due to a low hot surge tank level switch malfunction. Reactor water level control is lost and the water level decreases below the MSIV isolation setpoint resulting in uncovering of the core and fuel clad degradation.

Based on EPI-A1, Attachment 3, 1 ("Loss of 2 fission product barriers with a potential loss of third barrier") the Emergency Coordinator declares a General Emergency.

Offsite authorities are notified and public protective actions are recommended. The Emergency Broadcast system is utilized to notify the public and use of the early warning siren system is simulated.

At 1:15 p.m. increased containment pressure causes the failure of the third fission product barrier (containment) allowing a major release of radioactivity through the Annulus Exhaust Gas Treatment System to the environment.

Radiation monitoring teams follow the path of the plume, and onsite efforts continue to attempt to gain control and stabilize the plant.

At 2:00 p.m. some of the reactor control rods begin inserting and the Standby Liquid Control System completes injection. Forty-five minutes later the Control Room reports that the reactor is shutdown and all rods are inserted. Efforts continue to stabilize and improve plant conditions. With the decrease in containment pressure, the release decreases until the containment pressure returns to atmospheric pressure and the release is terminated.

Radiation monitoring teams follow the path of the plume and onsite efforts continue to stabilize and improve plant conditions.

Due to the long duration of the emergency, turnovers between key onsite response personnel will be occuring to provide a rest period for those initial responders who directed the early phases of the emergency response effort.

With all required activities successfully demonstrated onsite and offsite, the emergency is de-escalated so that recovery operations can begin.

After all required re-entry activities (plant only) are underway, the Exercise is terminated at 4:45 p.m.