U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/89025(DRSS)

Docket No. 50-440 License No. NPF-58

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

Facility Name: Perry Nuclear Power Plant, Unit 1

Inspection At: Perry Site, Perry, Ohio

Inspection Conducted: August 29 through September 1, 1989

Inspectors: J. Foster
Team Leader

Date 9/27/89

Accompanying
Inspectors: T. Colburn

G. Stoetzel

Approved By: T. Ploski, Acting Chief
Radiological Controls and
Emergency Preparedness Section

Date 9/27/89

Inspection Summary

Inspection on August 29 through September 1, 1989 (Report No. 50-440/89025(DRSS))
Areas Inspected: Routine, announced inspection of the Perry Nuclear Power Plant annual emergency preparedness exercise involving observations by three NRC representatives of key functions and locations during the exercise (IP 82301). This inspection included a review of concerns from previous inspections (IP 92701). The inspection involved three NRC inspectors.
Results: No violations, deficiencies or deviations were identified. The licensee demonstrated an excellent response to a challenging, hypothetical scenario involving multiple equipment failures and a minor release of radioactive material. NRC Region III personnel also participated in this exercise. Only minor interface problems were experienced. Several concerns from previous inspections were closed.

DETAILS

1. NRC Observers and Areas Observed

J. Foster, Simulator Control Room, Technical Support Center (TSC), Operations Support Center (OSC), Emergency Operations Facility (EOF)
G. Steotzel, Simulator Control Room, EOF
T. Colburn, OSC, Inplant teams, Medical Drill

2. Persons Contacted

Cleveland Electric Illuminating Company

A. Kaplan, Vice President, Nuclear
*J. Anderson, Onsite Emergency Planning Coordinator
R. Tadych, Manager, Mechanical Design Section
F. Stead, Director, Nuclear Support Department
B. Walrath, Manager, Engineering Project Support Services Section
L. Vanderhorst, Plant Health Physicist
*M. Roseum, Emergency Planning Supervisor
K. Pech, Manager, Technical Section
D. Igyarto, Manager, Training Section
W. Coleman, Manager, Operational Quality Section
R. Farrell, Director, Services Department
*R. Vondrasek, Manager, Community Relations Section
E. Buzzelli, Manager, Cost & Program Section
L. Hartline, Manager, Procurement & Records Management Section
J. Bahleda, Emergency Preparedness QA Inspector

The above and approximately 70 other individuals attended the NRC Exercise Exit Interview held on August 31, 1989.

*Denotes those attending the NRC Open Item Exit Interview held on September 1, 1989.

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

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

a. (Closed) Open Item No. 440/79018-BB: This item addresses the licensee's response to a 1979 NRC bulletin on possible audibility problems encountered in high-noise areas when an evacuation of plant personnel is necessary. The licensee reviewed plant noise levels during power operation utilizing procedure OM19:TXI-0019, "PA System Audibility Testing." This procedure determined if a verbal message was audible or intelligible, and if fire or emergency alarms were audible while area equipment was in operation. Failing any part of the above test meant that the area "failed" the test.

It was noted that some areas of the plant were exempted from the test program: known low-noise areas, high-radiation areas, areas with infrequent personnel entry (while equipment is running), outdoor areas, or areas within which alternate accountability measures are normally utilized. These exemptions appeared to be appropriate.

Test documentation was reviewed. Fourteen areas located within the Turbine Building, Heater Bay, Control Complex, Intermediate Building, Auxiliary Building, and Radwaste Building failed the test. Documentation indicated that strobe light warning systems have been placed in those areas. Licensee personnel stated that the strobe light systems have been tested for operability, and response to strobe light initiation is included in employee training. This item is closed.

b. (Closed) Open Item No. 440/88006-02: During the Emergency Response Facility review, it appeared that the capacity of the plant process computer might not be adequate to guarantee full system functions during an accident situation when numerous demands for data and analysis could be expected. Licensee documentation indicated that, at the time of the inspection which identified this item, average Central Processing Unit (CPU) idle time was approximately 6.5%, which the licensee's staff also considered as being unacceptable.

The licensee has reviewed the overall system capacity and replaced computer system boards with boards supplied by Nemonix, Inc., that are capable of higher processing speed. Also, ancillary (nonessential) programs/processes have been removed from the main system, again increasing the overall capacity of the system. All composed points have had their update rates evaluated and revised as necessary (decreasing CPU utilization). Discussion indicated that the system is now at maximum feasible capacity, with an average CPU idle time of approximately 25%. It is felt that the additional capacity cannot be achieved with a computer system of this type and vintage, and the upgrades provide increased assurance that system performance would not degrade to an unacceptable level in an emergency situation. This item is closed.

c. (Closed) Open Item No. 440/88019-01: The licensee committed to inform the NRC of the method chosen to prevent unfiltered air leakage into the Technical Support Center (TSC) from the Mechanical Equipment Room and a tentative schedule for completion of needed modifications to implement the method chosen. By letter of February 10, 1989 (letter PY-CEI/OIE-0340 L) the licensee advised NRC Region III that the Mechanical Equipment Room would not become a part of the TSC isolation zone. Actions required to ensure that there was no inleakage to the TSC isolation zone were also provided.

Discussion with licensee personnel and a review of documentation indicated corrective actions had been completed. During testing, it was found that, due to HVAC system OM44 inbalance, there was inleakage to the TSC when stairwell door SB-021 was slightly open (no leakage

was noted when the door was closed). This door is not associated with the Mechanical Equipment Room, and is secured for accountability purposes when the TSC is activated. The system was operated in the isolated mod during the major portion of the Exercise and performed acceptably. This item is closed.

d. (Closed) Open Item No. 440/88019-02: This item tracked the needs to repair and successfully test the Emergency Operations Facility (EOF) Heating, Ventilating, and Air Conditioning (HVAC) system, and to successfully demonstrate the system's operation in the emergency mode. Discussion with licensee personnel and a review of documentation indicated that repair (of damper F-11) and testing of the EOF HVAC had been accomplished. Testing of the system to accommodate the expected heat load had also been successfully performed.

It was intended that the EOF HVAC system's operability in the Emergency Mode would be demonstrated during the majority of this Exercise; however, it appeared to exercise players that the system was not capable of handling the heat load of players, displays, and the Simulator at the same time, since temperatures in the Display Room were noted to increase while the system was in the Emergency Mode. The system was then switched back to normal mode for the remainder of the Exercise. Later discussion indicated that this perception was in error. Due to normal mode overcooling in the Display Room, which has few routine occupants, the vents in this room are kept closed, and this, rather than system inadequacy, precluded effective room cooling with a large number of exercise players present.

Additional discussion with licensee personnel indicated that steps will be taken to upgrade the testing and maintenance of the EOF HVAC components to improve the system's capability to maintain facility conditions over time. Open Item 440/88019-02 is closed, as the concerns it addressed have been rectified. A new Open Item, 440/89025-01 will be opened to track actions taken to improve the reliability of the EOF HVAC system.

4. General

An annual exercise of the Perry Nuclear Power Plant Emergency Plan was conducted at the Perry Nuclear Power Plant on August 30, 1989. The exercise tested the licensee's emergency support organizations' capabilities to respond to a simulated accident scenario resulting in a multiple equipment failures and a minor release of radioactive effluent. This was a utility-only exercise. State and local counties participated to a limited extent, providing communicators and Public Information personnel. NRC Region III personnel participated in this exercise by activating the NRC Regional Emergency Response Center and sending a team of personnel to the site. This was also the first year that the licensee utilized the simulator to drive the exercise.

Attachment 1 describes the Scope and Objectives of the exercise.
Attachment 2 describes the exercise scenario.

5. 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 Emergency Plan Implementing Procedures.

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 permit State and local authorities to take appropriate actions to protect the public's health and safety.

c. Observers

The licensee's observers monitored and critiqued this exercise along with three NRC observers. Licensee critiques were attended by NRC personnel to assess the licensee's capacity for self-identification of exercise deficiencies.

d. Exercise Critique

An exercise critique was held with the licensee and NRC representatives on August 31, 1989. The NRC discussed the observed strengths and weaknesses during the exit interview. A second exit interview, addressing the findings on Open Items, was held on September 1, 1989.

6. Specific Observations (IP 82301)

a. Control Room (CR)

For the first time, the licensee's simulator was utilized to drive exercise events. Modem communications allowed the simulator computer to drive displays in other facilities, significantly enhancing the realism of the exercise.

On initiation of scenario events (resin spill), simulator Control Room personnel took appropriate steps to ensure that the resin spill was handled in a safe manner. For example, health physics and chemistry staffs were notified, operability of the radwaste ventilation system was verified, and concern was expressed about resin getting into the floor drain system.

The Alert was properly declared in a timely manner by the Shift Supervisor. Notifications were made to the State, counties, and the NRC within 15 minutes after the declaration. The Alert declaration was delayed somewhat past the time predicted by the scenario, but

the Emergency Action Level for elevated inplant radiation levels allows thirty minutes of elevated radiation levels before classification. The Shift Supervisor observed conditions for 25 minutes, noted that it was unlikely that conditions would improve in the near future, and properly made the classification.

The Shift Supervisor completed the initial notification forms himself and, due to the rapidity of the scenario at that point, this worked out well. For more rapidly changing events, it would be better to delegate this task. The licensee also does not use the NRC Event Notification Worksheet (provided to licensees by NRC Information Notice 85-78), although the form is available for reference in the Control Room. Later discussion revealed that the licensee's review indicated the form did not improve communication with the NRC.

The Shift Supervisor made a very prudent decision to activate the Emergency Operations Facility (EOF) and Joint Public Information Center to support the NRC Site Team after he was advised of its dispatch to the Perry site.

The NRC resident inspector noted that the recorded message that is part of the pager system had part of the first sentence cut off when he called the system by telephone. This is normally the portion of the message which indicates whether the incident is a real event or a drill. Lacking this information could be detrimental. Licensee personnel indicated that the message is continuously self-repeating and, per their training, responders should remain on the line until they receive the entire message. This information should receive more emphasis during pager response training.

Near the end of the exercise, the Shift Supervisor made the decision (apparently without consultation with the EOF) to initiate the Standby Liquid Control on regaining the ability to utilize the system. This appeared to be a conservative decision.

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

b. Technical Support Center (TSC)

The TSC was a highly stressed area due to the variety of activities included in the exercise. Overall performance was very good. TSC personnel kept track of the status of plant systems and performed engineering analysis of the various options regarding mitigating strategies, such as an alternate path for injecting boron into the reactor coolant system.

Good command and control was demonstrated by the Operations Manager. Noise levels were generally maintained at acceptable levels. Periodic briefings kept TSC staff aware of significant events. Adequate logs

and notes were kept to facilitate later reconstruction of decisions and actions taken during the course of the accident. Status boards in the TSC were generally accurate.

Habitability checks and requests to check dosimetry were performed at intervals by a member of the health physics staff. The heating, ventilating, and air conditioning system (HVAC) was placed into the emergency recirculation mode for the duration of the exercise. This was done in response to a controller message (to demonstrate the capability of the system) rather than scenario conditions.

Placing the HVAC system into the recirculation mode took a total of approximately 17 minutes from the order to shift modes. This was because of the need to obtain an operator from the Operational Support Center (OSC), who then had to obtain and briefly review the pertinent procedure before proceeding to the Mechanical Equipment Room (near the TSC), to perform the actual system manipulation. There is no criterion on the time needed for such a ventilation system mode shift, but 17 minutes for manual initiation of the mode shift could be excessive in a situation where arrival of a radioactive plume at the facility is imminent. The system does have an automatic mode shift function which is activated on receipt of a high radiation alarm, so delays experienced during manually shifting the system were not a major concern.

TSC staff continuously watched for indications of additional system failures which would lead to an emergency action level (EAL) classification change.

The announcement that accountability was to take place was delayed by 7-9 minutes when this step in the Site Area Emergency Checklist was overlooked. Accountability was completed within the goal of thirty minutes from Site Area emergency declaration even with the delay.

TSC staff did an excellent job of reviewing the various reactor coolant system (RCS) boron injection options. Their review included considerations of sodium pentaborate production, percent boron required for reactor shutdown, system availability, system temperature (boron recrystalization is a major concern), system tank capacity and amount of sodium pentaborate needed to create the desired RCS concentration. Since much of the engineering review is complete (however informally in an exercise), it is recommended that an emergency alternate boron injection procedure be developed.

During the Recovery Planning phase, the recovery procedure was properly utilized. A list of equipment requiring repair or replacement was generated.

The Recovery Coordinator obtained equipment status from OSC supervisors and planners. Some initial confusion existed as to the status of Control Rod Drive (CRD) pump 'B'. This was quickly corrected by the OSC Manager. However, even though the OSC status

board correctly identified the reduction in spent fuel pool (SFP) 'A' heat exchanger flow and the tagout of SFP 'B' pump and heat exchanger as equipment in reduced states, these were not discussed with the Recovery Coordinator, nor did he scan the status boards and observe these conditions himself.

The status of these systems was included in the initial conditions of the exercise. Discussion of their status was noted to be lacking in all recovery discussions, including the TSC Recovery Meeting and TSC/EOF Recovery Briefing. It was later verified with the Recovery Coordinator that he simply omitted the status of those systems. While it was noted that some equipment status was missed in the initial recovery planning effort, the exercise schedule allowed only a short period of time for list generation. The list which was generated was detailed, including such small items as the need for replacement of the explosive squib on the Standby Liquid Control System, and the need for involvement of General Electric in the evaluation of the acceptability of the fuel, considering the experienced transient.

Technical discussions on the impact of the main steam relief valve leak were conducted and the conclusion properly reached that it had no significant impact. Other technical discussions involving the recovery phase were well orchestrated and of excellent and thorough quality.

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

- An emergency alternate boron injection procedure should be developed.

c. Operational Support Center (OSC)

Due to the numerous equipment failures and mini-scenarios incorporated into the exercise scenario, the OSC was considerably stressed. Performance was quite good.

The OSC Manager had good command and control of the OSC team members. Tasks to be performed, and their relative priority as assigned by TSC personnel, were updated as appropriate. It was noted that the status boards in the OSC do not have an assigned area for the display of task priority which was informally posted on one blank board. Priority listing of equipment repairs was initially made, but not later updated, although it was evident that the OSC Manager was aware of any priority changes.

OSC personnel consistently had a good sense of where personnel were, what the status of equipment was and what the priorities for returning equipment to service were. However, this information was not always accurately reflected on status boards, log sheets or black boards in

the OSC. 24 teams were tracked successfully; however, on at least three occasions, part of the teams had returned or moved to other locations without being accurately updated on the status board. On one occasion, the OSC Manager had to correct an equipment log sheet entry which listed a piece of broken equipment as restored to service 12 minutes after the entry.

Unnecessary personnel were kept out of the OSC conference room; however, noise levels were occasionally to high. At one point, the OSC Manager shouted for quiet, thinking he heard an announcement over the loudspeaker. This effectively quieted the OSC. Such requests for quiet should have been made more often. Carpet for the OSC , which would also attenuate noise to some extent, has been under consideration for some time. Additional noise reducing materials for the OSC, such as noise absorbing wall panels, should also be considered.

Most communications over phone lines and pagers were done properly and formally; however, one supervisor frequently failed to announce "This is a drill" prior to and following conversations. In another instance, the OSC Manager, during briefings with his maintenance supervisors, kept referring to the vent and drain valves from the scram discharge volume as "these valves" even though they were never clearly identified. More precise communications would have been appropriate.

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

- The status boards in the OSC should be revised to contain an assigned area for the display of task priority.

- Additional noise reducing materials for the OSC, such as noise absorbing wall panels, should be considered.

d. Mock-Up Maintenance Facility

The licensee established a mock-up of the damaged Control Rod Drive (CRD) pump 'B' using an actual pump which had been replaced by a Unit 2 CRD pump. This mock-up was in a maintenance repair training building. Initially, the lead maintenance man assigned to the repair crew seemed unsure of what to do and lacked the aggressiveness exhibited by other players. He also checked the pump shaft for free play (as a troubleshooting measure) without first verifying that the pump had been deenergized and tagged out. This resulted in some prompting by the Controller as to exactly what troubleshooting, precautions, and repair activities the lead maintenance man would take.

After finally establishing a repair plan, an unduly long period passed while waiting for the OSC to establish and verify that the equipment had been tagged out. After 20 minutes, the repair team

checked with the OSC on the tagout status and learned that the tagout team hangers had been pulled off that assignment for other "higher priority work." Given the existing trouble in getting rods fully inserted, CRD repair should have been high priority work. The OSC finally stationed a "human red tag" at the CRD pump 'B' breaker approximately 5 minutes later. While it was evident that the return of this pump was a high priority item, tracking the repair effort was lost in the press of other business. The licensee should focus more intently on the established priorities for equipment repair and not let competing priorities diminish the effectiveness of an otherwise excellent plan of attack.

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

e. Radwaste Building Mini-Scenario (Resin spill with contaminated man/contaminated injured man).

The Control Room was promptly notified of the hypothetical resin spill. An announcement regarding the spill was made over the paging system. Access to the area was properly restricted. Two operators in the spill area promptly evacuated to the relatively low-dose Solid Radwaste Control Room and made optimum use of "shadow-shielding."

Proper use of survey meters, air samplers, and dosimetry was generally observed. The supervisor in charge ordered dosimetry to be placed at the knee to conservatively obtain whole body dose measurement. Dosimetry was then clipped to the knee. This resulted in increased potential for bumping the dosimetry and knocking it off-scale or losing it, contaminating the dosimetry, or ripping a hole in the plastic protective clothing (PCs). It would be more appropriate to wear dosimetry both on the knee and on the chest to provide comparative results. Also, if dosimetry is to be worn on the knee, a better means of wearing it is, as was demonstrated by one health physicist, to place the dosimetry in a ziplock bag which is taped to the knee. This minimizes the potential for contamination or losing the dosimetry while providing easy access for checking dosimetry.

Operators took prompt action to evacuate personnel from the Solid Radwaste Control Room and to initially contain the spill by using cloth PCs. Swipes were taken outside the spill area to verify the contaminated area boundary.

Personnel leaving the spill area generally demonstrated proper techniques for removing PCs and frisking out. However, on one occasion, improper frisking technique was observed. A technician, who was frisking an individual, frequently touched the individual's clothing with the probe.

While cleaning up the simulated spill, the crew and the supervisor in charge were exposed to a simulated 300 mR/hr radiation field. Extending the spill boundary a few feet would have allowed cleanup

personnel to reduce their exposure when not actively engaged in cleanup activity. The supervisor could have better avoided some exposure even without extending the boundary, but failed to do so.

The controllers did a good job of setting initial conditions and controlling the simulation, but initially erred in calling the spill dose rate 2.5 R/hr on contact rather than at 1 meter from the spill as described in the scenario. They also negated operator attempts to use concrete walls within the spill area for shadow-shielding, presumably because the walls were not thick enough. It appeared that these walls could have provided some shielding.

Excellent frisking technique was observed while the contaminated man was being taken to the decontamination station and decontaminated. However, the helper assisting in the decontamination was unsure of what actions to take and created the potential for spreading contamination by stepping into potentially contaminated shower water.

Observations of the contaminated injured man drill at the resin spill indicated superb realism and acting on the part of the injured man. Many onlookers were convinced that the simulated injuries were real. However, miscommunication between the controller and the individual rendering first aid led the latter to incorrectly believe the chest wound to be a puncture.

Several problems existed with the technique for rendering first aid. Throughout the contaminated/injured man drill the participants appeared overly anxious to remove the victim. The injured individual was rapidly removed from the area utilizing a "half-drag" technique (dragging the feet). As the injury appeared to be a broken rib on the left side of the body, potential for puncturing a lung or the heart could exist with just two persons moving the individual in this manner. Even though the individual was in a 500 mR/hr area, a more prudent action would have been to wait for the medical response team to arrive prior to removing the individual.

The security guards rendering first aid properly acted to console the injured man and keep him alert, but efforts to help the injured man breathe, such as rolling him over to one side or propping him up into a sitting position, were not taken until the individual was moved to the ambulance area approximately one-half hour following the injury. Not moving the victim to a sitting position also complicated treatment of the simulated wound due to failure of the adhesive bandage to adhere to the injured man's wet skin. Had he been sitting, the bandage could have been wrapped around his chest without relying on the adhesive sticking to his body.

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

- During training, first-aid teams should review the potential consequences of various methods of victim transport.

f. Emergency Operations Facility (EOF)

As the scenario did not provide for a massive release of radioactive material, the EOF was not highly stressed in this exercise. This is consistent with NRC guidance for a utility-only exercise, and was compensated for by the challenges to the other facilities staffs by the exercise scenario.

During the Anticipated Transient Without Scram (ATWS), the reactor continued to produce approximately 30% power, and simulated radiological releases began to exceed Technical Specification limits. Licensee personnel considered the options of shutting the Main Steam Isolation Valves (MSIVs), thereby diverting the reactor's heat load to the containment suppression pool or continuing to violate Technical Specification release limits. The determination was properly made that diverting 30% reactor power to the containment would place the containment at risk. Under the provisions of 10 CFR 50.54(x), a licensed reactor operator is authorized to "take reasonable action that departs from a license condition or a technical specification . . . in an emergency when this action is immediately needed to protect the public health and safety." Such actions need to be approved, as a minimum, by a licensed senior operator prior to taking the action.

Dosimetry was issued to all EOF personnel. Habitability checks were performed routinely in the EOF during the course of the exercise.

The Emergency Coordinator (EC) provided frequent and concise update briefings on the status of the accident to the EOF staff throughout the exercise. All press releases were properly reviewed and signed by the EC. Hourly information updates were provided to the State, counties, and the NRC.

Status boards in the EOF were generally kept current. However, offsite radiation dose rates were not logged on the status board in the Dose Assessment Area. This resulted in the NRC Site Team having to continuously ask for the information.

The EOF had a copy of an impressive fire brigade pre-fire instructions procedure. This procedure listed, for various areas of the plant, important considerations such as area hazards, available fire suppression methods, access points, ventilation systems, and provided area diagrams.

There was a rapid identification and correction of erroneous information related to a nearsite gas truck spill and evacuation. Initial information as to a 4 mile evacuation (possibly a site evacuation route concern) was corrected to be a 1/4 mile evacuation.

Near the termination of the exercise, there was an excellent discussion and decision not to sound the offsite siren system and initiate an Emergency Broadcast System message regarding a fire at the Chardon School and the related need for an alternate assembly point if a local area evacuation was ordered. By this point in time, plant conditions made evacuation of persons near the site highly unlikely.

The licensee's dose assessment team was not very receptive to the NRC Site Team's suggestion to back calculate a turbine building vent monitor reading which would yield 5 rem to the thyroid at the site boundary. If the scenario conditions had imposed a heavy workload on the dose assessment group, declining such a request would be understandable. However, the scenario did not impose such a workload.

The EOF ventilation system was switched to the recirculation mode for several minutes, then switched back to the normal mode. The EOF Manager was hesitant to leave the system in the recirculation mode due to perceived system inability to handle the heat load in the recirculation mode, and the possibility of losing the various computer systems due to overheating. Discussion with licensee personnel indicated that the system has the capacity to handle the produced heat load of a full EOF compliment; however, the ceiling vents had been fully closed to reduce overcooling the room when sparsely occupied (normal conditions).

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

7. Exercise Scenario and Control

The licensee's scenario was very challenging for a utility-only exercise. Challenging aspects included: multiple equipment failures, twelve separate mini-scenarios, and assembly/accountability. As previously noted, the TSC and OSC were highly stressed by the scenario.

Overall, exercise control was considered very good.

8. Licensee Critiques

The licensee held critiques within each facility, and a summary critique where the conclusions of the Controller/Evaluators presented their preliminary findings to the players. NRC personnel attended these critiques, and determined that NRC-identified concerns had also been identified by licensee personnel.

9. Open Items

Open items are matters which have been discussed with the licensee, will be reviewed further by the inspector, and which involves some actions on the part of the NRC or licensee or both. An Open Item disclosed during this inspection is discussed in Section 3 of this report.

10. Exit Interview (IP 30703)

The inspectors held an exit interview regarding exercise evaluation findings on August 31, 1989, with the representatives denoted in Section 2. A second exit interview was held on September 1, 1989 regarding the status of previoualy-identified items. The NRC Team Leader discussed the scope and findings of the inspection. The Team Leader indicated that the licensee had demonstrated an excellent response to a challenging, hypothetical scenario involving multiple equipment failures and a minor release of radioactive material. NRC Region III personnel also participated in this exercise, and only minor interface problems were experienced. In the second exit interview, the licensee was told that several Open Items from previous inspections were closed. The licensee was also asked if any of the information discussed during the exit interviews was proprietary. The licensee responded that none of the information was proprietary.

Attachments:
1. Perry Nuclear Power Plant 1989 Exercise Scope and Objectives
2. Perry Nuclear Power Plant 1989 Exercise Scenario Outline

1.0 SCOPE AND OBJECTIVES

1.1 SCOPE

The 1989 Emergency Preparedness Exercise, to be conducted on August 30, 1989, will simulate accident events designed to test the effectiveness of the Emergency Preparedness Program for the Perry Nuclear Power Plant (PNPP), located in North Perry Village, Lake County, Ohio. Successful demonstration of the emergency response capabilities of the State of Ohio, and the Counties of Lake, Ashtabula, and Geauga was accomplished in the May 4, 1988 Emergency Preparedness Exercise and will not be demonstrated in this exercise.

1.2 OBJECTIVES

The major objective of the exercise is to demonstrate the response capabilities of the PNPP Emergency Response Organization. Within this overall objective, individual objectives are specified as follows:

ITEM NO.	OBJECTIVE
1	Demonstrate ability to mobilize staff and activate facilities promptly.
2	Demonstrate ability to fully staff facilities and to maintain staffing around the clock. LIMITING CONDITION: The ability to maintain around the clock staffing of the Technical Support Center (TSC), Operations Support Center (OSC) and Emergency Operations Facility (EOF) will be demonstrated by means of the development of staffing/shift relief rosters.
3	Demonstrate ability to make decisions and to coordinate emergency activities.
4	Demonstrate adequacy of facilities and displays to support emergency operations.
5	Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.
6	Demonstrate ability to mobilize and deploy field monitoring teams in a timely fashion.
7	Demonstrate appropriate equipment and procedures for determining ambient radiation levels.

ITEM NO.	OBJECTIVE
8	Demonstrate ability to notify off-site officials and agencies within 15 minutes of an emergency.
9	Demonstrate ability to periodically update off-site officials and agencies of the status of the emergency based on data available at the PNPP.
10	Demonstrate ability to notify emergency support pools (i.e., INPO, ANI, etc.).
11	Demonstrate ability to notify on-site personnel using plant alarm/PA system.
12	Demonstrate ability to effectively assess incident conditions and classify the incident correctly.
13	Demonstrate the organizational ability and resources necessary to manage an accountability of all or part of site personnel. LIMITING CONDITION: Personnel accountability will only be demonstrated in the Unit 1 Protected Area and EOF portion of the Training and Education Center (TEC).
14	Demonstrate the organizational ability and resources necessary to manage an orderly evacuation of all or part of site personnel. LIMITING CONDITION: Protected Area personnel will be evacuated to the adjacent parking areas during the performance of personnel accountability.
15	Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, such as inclement weather or traffic obstructions. LIMITING CONDITION: Obstruction will be an impediment to a site evacuation.

ITEM NO.	OBJECTIVE
8	Demonstrate ability to notify off-site officials and agencies within 15 minutes of an emergency.
9	Demonstrate ability to periodically update off-site officials and agencies of the status of the emergency based on data available at the PNPP.
10	Demonstrate ability to notify emergency support pools (i.e., INPO, ANI, etc.).
11	Demonstrate ability to notify on-site personnel using plant alarm/PA system.
12	Demonstrate ability to effectively assess incident conditions and classify the incident correctly.
13	Demonstrate the organizational ability and resources necessary to manage an accountability of all or part of site personnel. LIMITING CONDITION: Personnel accountability will only be demonstrated in the Unit 1 Protected Area and EOF portion of the Training and Education Center (TEC).
14	Demonstrate the organizational ability and resources necessary to manage an orderly evacuation of all or part of site personnel. LIMITING CONDITION: Protected Area personnel will be evacuated to the adjacent parking areas during the performance of personnel accountability.
15	Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, such as inclement weather or traffic obstructions. LIMITING CONDITION: Obstruction will be an impediment to a site evacuation.

ITEM NO.	OBJECTIVE
16	Demonstrate the organizational ability and resources necessary to control access to the site.
	LIMITING CONDITION:
	PNPP Security personnel will establish traffic control points at key intersections on-site. PNPP will also simulate requesting traffic control assistance from the Lake County Sheriff Department.
17	Demonstrate ability to continuously monitor and control emergency worker exposure.
18	Demonstrate ability to brief the media in a clear, accurate and timely manner.
19	Demonstrate ability to provide advance coordination of information released.
	LIMITING CONDITION:
	State and County participation may be limited.
20	Demonstrate ability to establish and operate rumor control in a coordinated fashion.
21	Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment, and vehicles.
	LIMITING CONDITION:
	The decontamination of vehicles will not be demonstrated.
22	Demonstrate adequacy of ambulance facilities and procedures for handling contaminated individuals.
23	Demonstrate adequacy of hospital facilities and procedures for handling contaminated individuals.
24	Demonstrate adequacy of on-site first aid facilities/equipment and procedures for handling contaminated individuals.

ITEM NO.	OBJECTIVE
25	Demonstrate ability to identify need for, request, and obtain Federal assistance. LIMITING CONDITION: Exercise participants will discuss with the NRC RIII Site Team the need for further Federal assistance. No Federal agencies will actually be contacted for assistance by the PNPP during the exercise.
26	Demonstrate ability to determine and implement appropriate measures for controlled recovery and re-entry. LIMITING CONDITION: This objective will be limited to the establishment of a Recovery Organization and the development of re-entry/recovery goals.

ITEM NO.	OBJECTIVE
25	Demonstrate ability to identify need for, request, and obtain Federal assistance. LIMITING CONDITION: Exercise participants will discuss with the NRC RIII Site Team the need for further Federal assistance. No Federal agencies will actually be contacted for assistance by the PNPP during the exercise.
26	Demonstrate ability to determine and implement appropriate measures for controlled recovery and re-entry. LIMITING CONDITION: This objective will be limited to the establishment of a Recovery Organization and the development of re-entry/recovery goals.

1989 PERRY EVALUATED EXERCISE

PERRY NUCLEAR POWER PLANT

6.2 SEQUENCE OF EVENTS

Approximate Time	Key Events
0700	Initial conditions are established. Commence exercise.
0715	A resin spill occurs in the Radwaste Building truckbay. A liner of dewatered spent resins was being loaded onto a flat-bed "lowboy" truck for transportation to a disposal site. As the liner was hoisted over the wall, the crane cable fails and the liner falls. The liner cracks and resins are spread on the truck bay floor. Radiation levels are 2.5 R within 1 meter of the spill.
0730	An ALERT should be declared {EPI-A1, Section E.II.1, "High radiation level or high airborne contamination which indicates a severe degradation in the control of radioactive materials 1000 times the normally indicated levels for more than 30 minutes")}. The TSC and OSC are directed to be activated.
0800	The Shift Supervisor is informed by the NRC that the Regional Site Team is being dispatched to PNPP. The Shift Supervisor may direct the EOF to be activated.
0802	The scram valves begin to leak. This will not be apparent to the operators. Blockage of the drain line causes the scram discharge volume to fill up.
0804	The "Instrument Volume Not Drained" annunciator is received.
0809	The STA should be dispatched to the appropriate Control Room back panels to read the Scram Discharge Volume level meters. A PPO may be dispatched into containment to determine the leaky valves.
0812	The "Rod Withdrawal Block" annunciator is received.
0817	The operators should commence a reactor shutdown. Recirculation flow is runback until reactor power is approximately 55-60%.

6.2 SEQUENCE OF EVENTS

Approximate Time	Key Events
0820	A scram is attempted by arming and depressing the RPS manual scram push buttons. No rod motion occurs. In accordance with PEI-B13 (RPV Control) the operators attempt to shutdown the reactor by placing the mode switch in SHUTDOWN followed by the manual alternate rod insertion (ARI) function of the Redundant Reactivity Control System. There is some sporadic inward rod motion on most of the control rods. Reactor power is approximately 30%. Due to the transient, several fuel pins develop pinhole leaks.
0821	CRD B Pump (C11-C001B) trips due to low oil pressure.
0825	Off-gas pretreatment monitor levels increase. Turbine Building area radiation monitor readings increase due to the failed fuel pins cladding coupled with the MSR manway leak. Turbine Building/heater bay vent monitor readings increase slightly, but remain below Technical Specification limits.
0828	Safety Relief Valve (B21-F051D) opens and remains stuck open (until SLC is injected or until just prior to a suppression pool temperature of 110°F).
0830	Standby Liquid Control system is initiated. Upon initiation, SLC Pump A (C41-C0001A) fails due to a ground in the circuitry of the pump. This results in an actuation of a ground fault relay which trips BUS EF1A. The pump will be returned to service at 1335. When BUS EF1A trips, power is lost to the Fuel Pool Cooling Pumps, Diesel Generator 1 Cooling, Rod Control and Information System, and many ECCS and other valve indications. Plant staff will have to isolate and repair the ground fault and assess the loss of fuel pool cooling, so soon after a refueling outage. The operators should inhibit the actuation of ADS per PEI-B13. Suppression pool cooling is placed in service.

1989 PERRY EVALUATED EXERCISE

PERRY NUCLEAR POWER PLANT

6.2 SEQUENCE OF EVENTS

Approximate Time	Key Events
0820	A scram is attempted by arming and depressing the RPS manual scram push buttons. No rod motion occurs. In accordance with PEI-B13 (RPV Control) the operators attempt to shutdown the reactor by placing the mode switch in SHUTDOWN followed by the manual alternate rod insertion (ARI) function of the Redundant Reactivity Control System. There is some sporadic inward rod motion on most of the control rods. Reactor power is approximately 30%. Due to the transient, several fuel pins develop pinhole leaks.
0821	CRD B Pump (C11-C001B) trips due to low oil pressure.
0825	Off-gas pretreatment monitor levels increase. Turbine Building area radiation monitor readings increase due to the failed fuel pins cladding coupled with the MSR manway leak. Turbine Building/heater bay vent monitor readings increase slightly, but remain below Technical Specification limits.
0828	Safety Relief Valve (B21-F051D) opens and remains stuck open (until SLC is injected or until just prior to a suppression pool temperature of 110°F).
0830	Standby Liquid Control system is initiated. Upon initiation, SLC Pump A (C41-C0001A) fails due to a ground in the circuitry of the pump. This results in an actuation of a ground fault relay which trips BUS EF1A. The pump will be returned to service at 1335. When BUS EF1A trips, power is lost to the Fuel Pool Cooling Pumps, Diesel Generator 1 Cooling, Rod Control and Information System, and many ECCS and other valve indications. Plant staff will have to isolate and repair the ground fault and assess the loss of fuel pool cooling, so soon after a refueling outage. The operators should inhibit the actuation of ADS per PEI-B13. Suppression pool cooling is placed in service.

6.2 SEQUENCE OF EVENTS

Approximate Time	Key Events
0845	A SITE AREA EMERGENCY should be declared (EPI-A1 D.III.2a; "Complete loss of any functions needed for plant hot shutdown"). The EOF and JPIC are directed to be activated.
0900	The reactor continues to generate 30% power through the main turbine-generator.
0920	A minor automobile accident occurs on Center Road near the Visitors Registration Center. Traffic leaving the site is impeded. Security responds.
0930	The NRC Site Team arrives.
	An inadvertent initiation of the Division 1 Emergency Core Cooling System occurs due to relay failures. I&C should respond to repair.
0935	Restoration of EF1A buses should be underway.
1030	Security is notified of an attempted entry situation. A free-lance photographer attempts to enter the protected area on the east perimeter. The individual's entry will set off security alarms in the Central Alarm Station. Security personnel will respond.
	Power is restored to EF1A and some associated buses. SLC Pump A remains out of service due to a ground fault on the Pump breaker.
1045	CRD B Pump is repaired and returned to service.
1050	With CRD system operable, operators selectively insert rods. Reactor power decreases.
1055	CRD B Pump trips again on low oil pressure, due to failure of the temporary repair. Reactor power is approximately 15%.
	Operators reset the scram system. The Scram Discharge Volume (SDV) drains slowly. Operators will wait for the SDV to drain, reset the system and initiate a scram approximately every 60 minutes.

6.2 SEQUENCE OF EVENTS

Approximate Time	Key Events
1100	The plant is relatively stable. Minor power oscillations occur due to the use of pressure control and cold water to maintain reactor water level.
1200	The instrument volume is drained and a scram is initiated. Some rods insert and power drops to 6%. Operators should trip the turbine and vent reactor steam to the condenser.
1230	An injury occurs at the scene of the resin spill. A worker cleaning up the spill slips, falls against truck bed, rendering him dazed with breathing difficulty. The worker crawls out of the spill area and pulls off respirator due to his difficulty in breathing. The extent of the victim's injuries is such that he cannot be decontaminated onsite. The Perry Township Fire Department is called. The contaminated injured victim is taken to Lake West Hospital.
1300	The instrument volume drains and another scram is initiated. Again several rods insert several notches, power drops to 0%. The unit is subcritical for the given plant conditions. However, control rod positions and plant conditions are such that criticality may be reachieved if the reactor is cooled down improperly.
1335	SLC A Pump is repaired. Operators may choose not to use SLC system since ARI is working, albeit slowly.
1350	The main generator hydrogen supply system experiences a hydrogen leak. Regulator Bypass Valve N35-F535 Bonnet fails, allowing the hydrogen to leak and depressurizing the generator. Safety and repair teams are dispatched.
1400	The instrument volume drains and another scram is initiated. All rods are fully inserted. Operators should commence cool down per IOI-7 at 100°F per hour.
1430	Recovery actions may be implemented at this time.
1530	The exercise may be terminated.

1989 PERRY EVALUATED EXERCISE

PERRY NUCLEAR POWER PLANT

6.2 SEQUENCE OF EVENTS

Approximate Time	Key Events
1100	The plant is relatively stable. Minor power oscillations occur due to the use of pressure control and cold water to maintain reactor water level.
1200	The instrument volume is drained and a scram is initiated. Some rods insert and power drops to 6%. Operators should trip the turbine and vent reactor steam to the condenser.
1230	An injury occurs at the scene of the resin spill. A worker cleaning up the spill slips, falls against truck bed, rendering him dazed with breathing difficulty. The worker crawls out of the spill area and pulls off respirator due to his difficulty in breathing. The extent of the victim's injuries is such that he cannot be decontaminated onsite. The Perry Township Fire Department is called. The contaminated injured victim is taken to Lake West Hospital.
1300	The instrument volume drains and another scram is initiated. Again several rods insert several notches, power drops to 0%. The unit is subcritical for the given plant conditions. However, control rod positions and plant conditions are such that criticality may be reachieved if the reactor is cooled down improperly.
1335	SLC A Pump is repaired. Operators may choose not to use SLC system since ARI is working, albeit slowly.
1350	The main generator hydrogen supply system experiences a hydrogen leak. Regulator Bypass Valve N35-F535 Bonnet fails, allowing the hydrogen to leak and depressurizing the generator. Safety and repair teams are dispatched.
1400	The instrument volume drains and another scram is initiated. All rods are fully inserted. Operators should commence cool down per IOI-7 at 100°F per hour.
1430	Recovery actions may be implemented at this time.
1530	The exercise may be terminated.