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

PERRY NUCLEAR POWER PLANT
1994 ANNUAL EXERCISE

The following is the onsite sequence of events and the scope and objectives from the Perry Nuclear Power Plant 1994 annual exercise held on June 15, 1994.

The evaluation of this exercise is contained in the integrated inspection report number 50-440/94010(DRP).

IE06
IE35

1.0 SCOPE AND OBJECTIVES

The scope of the exercise is defined in Section 1.1. The exercise objectives are provided as separate sections, divided into the objectives for the Perry Plant (Section 1.2) and those of the state of Ohio and Counties of Lake, Ashtabula and Geauga (Section 1.3).

SCOPE AND OBJECTIVES

1.1 SCOPE

The 1994 Emergency Preparedness Exercise, to be conducted during normal working hours as an announced exercise on June 15, 1994, will simulate accident events culminating in a radiological accident with resultant offsite releases from the Perry Plant, located in North Perry Village, Lake County, Ohio. The Exercise will involve events designed to test the effectiveness of the Perry Plant Emergency Preparedness Program and the integrated emergency response capabilities of the State of Ohio and the Counties of Lake, Geauga, and Ashtabula.

1.2 ON-SITE OBJECTIVES

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

NOTE: Changes to the 90-day Exercise Objectives, submitted to the NRC on February 10, 1994 under CEI Letter PY-CEI/OIE-0411L are indicated through the use of the change bars where appropriate.

ITEM NO.	OBJECTIVE
A.	**EVENT CLASSIFICATION**
1.	Demonstrate ability to effectively assess postulated plant indications, alarms and reports, and correctly classify an emergency event in a timely manner.
2.	Demonstrate ability to correctly identify a series of postulated emergency events which escalate to a Site Area or General Emergency classification.
3.	Demonstrate ability to correctly terminate from the emergency phase and enter Recovery per procedural guidelines.
	Limiting Condition: Demonstration will be limited to correctly identify procedural criteria and requirements for terminating from a General Emergency and entry into Recovery. No Recovery activities, planning or formation of a Recovery Organization will be demonstrated.

B. ERO NOTIFICATIONS/RESPONSE

1. Demonstrate ability to notify on-call ERO personnel in a timely manner upon (re)classification of an emergency event.

2. Demonstrate ability to adequately staff and activate facilities promptly in support of postulated emergency conditions.

3. Demonstrate ability to augment staffing in support of postulated emergency conditions.

4. Demonstrate ability to effectively direct the activation of emergency facilities in a timely manner when required by procedure or warranted based on postulated events.

C. OFFSITE NOTIFICATIONS

1. Demonstrate ability to notify the State of Ohio and local counties within 15 minutes of initially declaring and reclassifying an emergency event.

2. Demonstrate ability to notify the NRC within one hour of initially declaring or reclassifying an emergency event.

3. Demonstrate ability to periodically update Federal, State and local county officials and agencies on the status of emergency based on available information.

4. Demonstrate ability to maintain an open line over the ENS and "5-way" circuits and respond to inquiries promptly.

5. Demonstrate the ability to effectively transfer responsibility for ENS and "5-way" circuits between facilities.

6. Demonstrate ability to notify and periodically update utility support organizations (e.g., INPO, ANI) as required.

7. Demonstrate mechanism for recommending protective actions to State and local county authorities.

D. EMERGENCY COMMUNICATIONS

1. Demonstrate ability to communicate clearly and effectively between onsite facilities.

2. Demonstrate ability to communicate clearly and effectively with shift and OSC repair/assessment team personnel dispatched in-plant.

3. Demonstrate ability to communicate clearly and effectively with Radiation Monitoring Teams (RMTs).

4. Demonstrate ability to effectively warn or advise Plant personnel or individuals onsite or in adjacent areas controlled by CEI utilizing the Plant Public Address (PA), Exclusion Area Page, and Tone-Alert Radio Systems.

E. COMMAND AND CONTROL

1. Demonstrate ability of Shift Supervisor to promptly assume and carry out duties of the Emergency Coordinator upon the initial classification of an emergency event.

2. Demonstrate the effective and orderly transfer of Emergency Coordinator duties between facilities.

3. Demonstrate ability of key ERO personnel to coordinate emergency assessment and response activities.

4. Demonstrate ability to establish/revise in-plant ERO priorities and effectively utilize ERO personnel to address priorities.

5. Demonstrate ability to effectively coordinate facility activities and to update facility staff on event status, priorities, and expected actions.

6. Demonstrate the ability to coordinate the assembly, effective briefing/debriefing, and timely dispatching of OSC teams.

7. Demonstrate ability to promptly access spare/replacement parts and deliver to OSC or in-plant repair teams.

8. Demonstrate the effective coordination of on-shift personnel and their integration with the Emergency Response Organization (ERO) when mobilized.

9. Demonstrate ability to effectively transfer dose assessment responsibility and control of RMTs between facilities.

10. Demonstrate ability to effectively control RMT movements in relation to the release plume.

11. Demonstrate ability of Plant, and State and local county governments to work effectively and in a coordinated manner as specified in the Plant Emergency Plan.

F. ACCIDENT ASSESSMENT/RESPONSE

1. Demonstrate the timely and effective use of PEIs, ONIs, and other operations procedures to respond to postulated indications, alarms and reports.

2. Demonstrate ability of ERO to assess postulated equipment or component failures in a timely manner and effectively develop corrective actions to mitigate events.

3. Demonstrate the ability to identify the source of an actual or potential radiological release and postulated magnitude based on plant system parameters and effluent monitors.

4. Demonstrate ability to mobilize and deploy RMTs in a timely manner.

5. Demonstrate appropriate equipment and procedures for determining ambient radiation levels.

6. Demonstrate appropriate equipment and procedures for measuring airborne radioactive concentrations as low as 10^{-7} uCi/cc under field conditions in the presence of noble gases.

7. Demonstrate ability to project exposures based on plant effluent monitor readings and field data for various meteorological conditions.

8. Demonstrate ability to determine appropriate protective action recommendations for the general public based on NUREG-0654, Appendix 1 and EPA-400-R-92-001 guidelines.

9. Demonstrate ability for determining the source term of releases of radioactive material within plant systems (e.g., relationship between containment radiation monitor readings and radioactive material available for release from containment.

10. Demonstrate ability to effectively track airborne radioactive plume using RMTs.

11. Demonstrate appropriate equipment and procedures for monitoring ground contamination and for the collection, transport, and analysis of environmental samples (e.g., water, soil, vegetation).

12. Deleted

13. Demonstrate provisions made for estimating integrated (accumulated) dose from projected and actual dose rates and for comparing these estimates with PAGs.

14. Demonstrate onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident, to include:

    - o post-accident sampling capability
    - o radiation and effluent monitors
    - o in-plant radiation monitoring instrumentation
    - o containment radiation monitoring

Limiting Condition: Postulated scenario will support the demonstration of the Post Accident Sampling System (PASS). PASS operations may be demonstrated by obtaining a demineralized water sample, in lieu of obtaining an actual sample.

15. Demonstrate access to fixed or mobile laboratory facilities.

NOTE: To be demonstrated as part of PASS activities.

G. **FACILITIES AND EQUIPMENT**

1. Demonstrate the effective operation and adequacy of the following onsite facilities in the assessment and mitigation of postulated emergency event:

- Control Room
- Technical Support Center (TSC)
- Operations Support Center (OSC)
- Emergency Operations Facility (EOF)
- Public Information Response Team (PIRT)

2. Demonstrate the ability of key ERO personnel to perform the staffing responsibilities outlined in Table 8-1 of the Emergency Plan for the event postulated.

3. Demonstrate the ability of facility staff to update/maintain status boards and other displays in an accurate and timely manner.

4. Demonstrate ability of ERO staff to effectively use the Emergency Response Information System (ERIS) to monitor and assess plant conditions.

5. Demonstrate ability of ERO staff to properly respond to postulated high area/airborne radiation levels in one or more facilities or the failure of a facility radiation monitor.

6. Demonstrate ability of TSC and EOF staff to place facility HVAC in emergency isolation mode.

7. Demonstrate ability of the TSC and EOF HVAC systems to adequately maintain facility temperature control within established limits.

8. Demonstrate the availability of equipment (including dosimetry and sampling devices) to effectively support facility operations, OSC teams, and RMTs.

9. Demonstrate ability to access and acquire data from geophysical phenomena monitors (e.g., meteorological data).

H. ACCOUNTABILITY

1. Demonstrate ability to account for all individuals within the Protected Area upon initiation of personnel accountability by ascertaining the names of missing individuals within 30 minutes and accounting for Protected Area personnel continuously thereafter.

   Limiting Conditions: Personnel accountability will only be demonstrated within the Control Room and emergency facilities. The evacuation of non-essential personnel from the Protected Area will be simulated. Site Protection personnel will walkthrough actions need to obtain accountability.

2. Deleted
3. Deleted
4. Deleted

5. Demonstrate ability to radiologically monitor individuals evacuating the Protected Area.

I. EXPOSURE CONTROL

1. Demonstrate ability to effectively monitor and control emergency worker exposures per Plant procedures.

2. Demonstrate the ability to authorize extensions for Plant emergency worker exposures in an expeditious manner which takes into account reasonable consideration of relative risks.

   Limiting Condition: Authorization based on free play by participants. If response to postulated events does not force dose extensions, a walk through of required actions will be demonstrated by appropriate TSC and OSC staff members with controller(s).

3. Demonstrate the ability to assign personal dosimetry, effectively monitor exposure at appropriate frequencies, and maintain accurate dose records for Plant emergency workers.

4. Demonstrate adequate equipment and procedures for decontamination of Plant emergency workers and equipment, and for waste disposal.

5. Demonstrate onsite contamination control measures, including area access control, drinking water and food supplies, and criteria for permitting return of areas and items to normal use.

6. Demonstrate adequate equipment and procedures for individual respiratory protection and use of protective clothing for individuals remaining or arriving onsite during the postulated emergency event.

7. Deleted

8. Deleted

J. MEDICAL RESPONSE

1. Demonstrate the ability of onsite first aid responders to effectively assess a medical emergency and render appropriate medical care within their training in a timely manner.

2. Demonstrate the adequacy of health physics support in determining the radiological status of a victim and advising first aid responders on radiological concerns.

3. Demonstrate the adequacy of facilities and equipment to support first aid responders.

4. Demonstrate the ability to promptly notify and request offsite ambulance support for transportation of a victim.

5. Demonstrate the organizational ability and procedures for Plant first aid responders, health physics and security officers to effectively coordinate; access and egress into the Protected Area of an offsite ambulance; dressout and radiological monitoring of the ambulance and crew; and transfer of a victim.

6. Demonstrate the ability to notify and coordinate with a local medical facility for the care, handling and treatment of a contaminated and injured victim.

   Limiting Condition: Primary care facility, Lake East Hospital in Painesville, OH, will be utilized.

7. Demonstrate the ability of offsite medical facility to evaluate radiation exposure and uptake to a contaminated victim.

8. Demonstrate the ability of Health Physics personnel to effectively decontaminate an injured victim(s) per Plant procedures prior to transport.

   Limiting Condition: Objective may be demonstrated by simulating multiple accident victims.

K. PUBLIC INFORMATION/RUMOR CONTROL

1. Demonstrate points of contact and physical locations for use by news media during an emergency.

2. Demonstrate the organizational ability and procedures which:

   - designate a spokesperson having access to necessary information
   - arrange for a timely exchange of information among designated spokespersons

3. Demonstrates the ability to brief media representatives in a clear, accurate and timely manner.

4. Demonstrate the ability to monitor the media to detect and correct errors.

5. Demonstrate the ability of Company telephone attendants and personnel to reroute incoming inquiries regarding the emergency to the PIRT/JPIC.

6. Demonstrate the ability to establish and operate rumor control in a coordinated fashion.

7. Demonstrate the ability of the PIRT/JPIC to disseminate information to Company employees.

L. **RECOVERY**

No objectives to be demonstrated under this category.

1.3 OFF-SITE OBJECTIVES

The off-site agencies' objectives are found as follows:

Table 1.1	State of Ohio
Table 1.2	Ashtabula County
Table 1.3	Geauga County
Table 1.4	Lake County

1994 EVALUATED EXERCISE

PERRY PLANT

6.2.1 ON-SITE SEQUENCE OF EVENTS

Approximate Time	Key Events	Mini-Scenario Reference
0645	Control Room and plant turnover briefings.	
0730	Operator should place RHR "B" loop in Suppression Pool Cooling mode.	
0745	Upon the completion of the Containment purge, CNTMT Purge Supply Bypass Isolation Dampers M14-F195 and M14-F190 do not close. Operators should be dispatched to close the valves.	MS No. 6
0755	A fire breaks out in the RHR "A" Pump Room (AB 574'), where maintenance workers were changing pump oil, when a drop light falls and breaks. A spark ignites nearby solvent and solvent-soaked rags, resulting in a fire. The fire then ignites the oil which spreads through the room and down through the floor grating.	MS No. 7
	One worker is seriously burned and the other injures his hand. Both workers are contaminated.	MS No. 8
0757	The Fire Brigade and First Aid Team are toned out; offsite fire-fighting assistance and an ambulance are also requested by the Secondary Alarm Station (SAS).	
0800	**The Shift Supervisor should declare an ALERT per EPI-A1, Initiating Condition F.II.1, "Fire Affecting or Potentially Affecting a Safe Shutdown System."** The Technical Support Center (TSC) and Operations Support Center (OSC) should be directed to be activated at this time. A decision should also be made to activate the Public Information Response Team (PIRT).	
~0840	The Perry Plant is notified over the "5-Way" State/County dedicated circuit of the State's departure to Perry via Ohio National Guard helicopter.	

6.2.1 ON-SITE SEQUENCE OF EVENTS

Approximate Time	Key Events	Mini-Scenario Reference
~0845	The contaminated burn victim is transported by Perry Township Fire Department ambulance to Lake East Hospital. The second victim is decontaminated by Health Physics before being treated at Site Dispensary.	MS No. 8
0850	Water level in the 5A feedwater heater fluctuates when control valve 1N25-F340A experiences a malfunction due to an oil leak. All alarms sub-subsequently clear.	MS No. 19
0910	Feedwater Heaters 6A and 5A isolate when control valve 1N25-F340A fails closed due to the oil leak. Reactor power increases to 104%; operators implement ONI-N36, "Loss of Feedwater Heating", and reduce power to 95%. Teams should be dispatched to troubleshoot.	
0930	Emergency Service Water (ESW) pump 1P45-C001B trips when a short circuit occurs due to a loose "B" Phase termination ground. Operators and/or an OSC team should be dispatched to investigate. The unavailability of RHR "A", (Initial Condition), combined with the loss of ESW "B", should be identified as an **ALERT per EPI-A1, Initiating Condition D.II.1, "Loss of Functions Needed to Achieve and Maintain the Reactor in Cold Shutdown."**	MS No. 9
~0940	The Ohio National Guard helicopter lands at the Perry Plant Helistop adjacent to the Training and Education Center (TEC). Ohio Emergency Management Agency (OEMA) officials arrive at the EOF.	
~0950	As the Ohio National Guard (ONG) helicopter takes off, propwash causes a high voltage line adjacent to Center Road to fall. Site access/egress is impeded; Security should take compensatory actions.	MS No. 15
1045	An Accumulator Fault alarm is received. An Operator should be dispatched to investigate and/or recharge the accumulator.	MS No. 10

6.2.1 ON-SITE SEQUENCE OF EVENTS

Approximate Time	Key Events	Mini-Scenario Reference
1055	A second Accumulator Fault alarm is received.	MS No. 10
1100	CRD pump 1C11-C001A trips when its shaft seizes. An Operator or OSC Team should be dispatched to investigate. In accordance with ONI-C11-1, a manual scram must be initiated if a CRD pump or one of the 2 Accumulators can not be restored within 20 minutes.	MS No. 11
1110	(If the first accumulator is recharged) a third Accumulator Fault alarm is received.	MS No. 10
1115	I&C Technicians performing SVI-C11-T0246-B, "Instrument Calibration for Scram Discharge Volume (SDV) Level Transmitter LT-N017B," report that upon opening a test connection valve, a silicone-like substance drips slowly out of the valve.	MS No. 5
~1120	The ONI-C11-1 grace period expires; the Control Room Shift Supervisor should initiate a manual scram. When the scram is initiated, only a few control rods move inward. Operators attempt to insert control rods by other means per PEI-B13, "RPV Power Control", but are unsuccessful since the SDV is full of water and the control rods are hydraulically locked.	
1125	Operators initiate SLC Pump "A" when it is determined that the rods cannot be inserted. SLC begins injecting to the reactor vessel.	
1126	SLC injection stops when an RRCS Power Supply fails causing a logic error in the SLC Pump "A" control card.	MS No. 12, 13
1128	Operators will lower power by tripping off Recirculation Pumps and by lowering reactor water level per PEI-B13. Power eventually settles at approximately 50%.	

6.2.1 ON-SITE SEQUENCE OF EVENTS

Approximate Time	Key Events	Mini-Scenario Reference
1130	**The Emergency Coordinator should declare a SITE AREA EMERGENCY per EPI-A1, Initiating Condition D.III.1, "Transient Requiring Operation of Shutdown Systems with a Failure to Scram (Anticipated Transient without Scram)."** He should direct the activation of the Emergency Operations Facility (EOF) and JPIC (if not yet mobilized).	
~1145	The NRC should notify the Perry Plant over the Emergency Notification System (ENS) circuit that Region III is dispatching a Site Team. Estimated time of arrival at the Perry site is 1500 hours.	
1248	CRD pump 1C11-C001B is returned to service and the ability to insert control rods is available. As Operators insert the first bank of control rods, CRD pump 1C11-C001B trips due to low oil pressure.	MS No 1
1251	Due to fuel failure which occurred when the first bank of control rods is inserted, the Main Steam Isolation Valves (MSIVs) isolate on High Radiation. Reactor energy is subsequently directed via the SRVs to the Suppression Pool. Containment pressure and temperature will begin to increase. Since Suppression Pool cooling is unavailable, Suppression Pool temperature will continue to increase. Containment parameters increase to the point where Containment spray is required. The Suppression Pool is used as the source of water for containment spray, and its temperature will be too high to be effective in reducing Containment temperature and pressure.	
1259	Plant staff should determine that the Heat Capacity Limit of the Suppression Pool has been exceeded. Per PEI-T23, "Containment Control", emergency depressurization is required. This action will add considerable heat to the Suppression Pool.	MS No. 14

6.2.1 ON-SITE SEQUENCE OF EVENTS

Approximate Time	Key Events	Mini-Scenario Reference
1300	The Emergency Coordinator should declare a **GENERAL EMERGENCY [per EPI-A1, Initiating Condition D. IV.1, "Failure of requisite core shutdown systems during a transient (e.g., ATWS) which could lead to a core melt in several hours with containment failure likely", or initiating condition o.iv.1, "loss of two fission product barriers with a potential loss of the third barrier."]** Default Protective Action Recommendations (PARs) should be proposed to the State and Counties.	
1330	Containment pressure continues to increase due to the lack of Suppression Pool Cooling. When Containment pressure exceeds 15 psig, PEI-T23, "Drywell and Containment Pressure Control", requires Operators to consider venting the containment if pressure will approach/exceed 40 psig. (NOTE: As a contingency for offsite objectives, if venting is implemented prior to 1345, FPCC Inboard Isolation Valve G41-F140 fails closed.)	MS No. 14
1345	High Unit 1 Vent radiation readings are indicated. A failure of a fillet weld on Root Valve 1M14-P603 [adjacent to the Containment Purge Supply Outboard Isolation Valve (1M14-F040)] occurs, resulting in an opening from the Containment into the Annulus through a test connection line. A release to the environment begins from the Annulus to AEGTS "A" Train and out the Unit 1 Vent. Plant staff may attempt to identify and establish a credible pathway for alternate boron injection. Upgraded Protective Action Recommendations based on dose projection estimates should be proposed to the State and Counties.	MS No. 16

6.2.1 ON-SITE SEQUENCE OF EVENTS

Approximate Time	Key Events	Mini-Scenario Reference
~1345	ESW Pump "B" is returned to service. Containment Spray should be initiated using RHR 'B' Loop in an attempt to reduce Containment pressure.	MS No. 9
~1400	SLC Pump "A" and/or CRD Pump "B" may be returned to service based on OSC troubleshooting and repair activities.	MS No. 1, 12, 13
1415	Bypass Isolation Damper 1M14-F190 closes due to the high Containment pressure. This closure stops the release to the environment.	MS No. 6
	The radiation monitor in the EOF alarms, indicating high radiation levels. Troubleshooting later determines that a ground fault caused the alarm.	MS No. 17
~1430	RHR "A" loop is returned to service. Operators should place RHR "A" loop into Suppression Pool Cooling mode or Containment Spray mode.	MS No. 2
~1500	Discussions should be initiated regarding actions needed to terminate from the Emergency Phase and enter into Recovery.	
1530	The Exercise may be terminated.	