U. S. Nuclear Regulatory Commission
Region I

Report Nos. 50-245/90-84
50-336/90-83
50-423/90-84

Docket Nos. 50-245
50-336
50-423

License Nos. DPR-61
DPR-65
NPF-49

Licensee: Northeast Nuclear Energy Company
P. O. Box 270
Hartford, Connecticut 06101-0270

Facility Name: Millstone Nuclear Power Plant

Inspection Conducted: December 4-6, 1990

Inspection At: Berlin and Waterford, Connecticut

Inspectors: C. G. Amato — December 16, 1990
C. G. Amato, Emergency Preparedness Specialist, Region I — date

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Approved: [signature] — 12/31/90
W. J. Lazarus, Chief, Emergency Preparedness Section, Division of Radiation Safety and Safeguards — date

Inspection Summary: **Inspection on December 4-6, 1990 (Combined Inspection Report Nos. 50-245/90-84, 50-336/90-83, and 50-423/90-84)**

Areas Inspected: Routine, safety inspection of the licensee's partial-participation emergency preparedness exercise.

Results: No exercise weaknesses were identified. The licensee demonstrated they could take adequate protective measures on behalf of public health and safety.

DETAILS

1. Persons Contacted

The following personnel attended the exit on December 6, 1990. Unless noted otherwise, personnel listed below are Northeast Utility staff members.

W. Buch, Senior Nuclear Emergency Preparedness Coordinator, Millstone Point
D. Clark, Shift Supervisor
F. Dacimo, Director, Site Services, Millstone Point
T. Dembek, Nuclear Emergency Preparedness Coordinator
R. Factoro, Director, Site Services, Millstone Point
J. Kangley, Senior Engineer
J. Keenan, Director, Millstone Unit No. 2
P. Luckey, Senior Nuclear Trainer, Training Department
J. Laine, Senior Scientist
E. Molloy, Supervisor, Emergency Preparedness
R. Rodgers, Manager, Radiological Assessment Branch
W. Romberg, Vice President, Nuclear Operations
S. Scace, Director, Millstone Point Nuclear Power Station
J. Sullivan, Manager, Health Physics Operations
G. Wilson, Public Information

The inspectors also interviewed other licensee personnel.

2. Emergency Exercise

The Millstone Station announced, partial-participation exercise was conducted on December 5, 1990 from 7:15 a.m. to 1:00 p.m. The State of Connecticut and surrounding towns participated.

2.1 Pre-exercise Activities

The exercise objectives were submitted to NRC Region I on August 24, 1990 and, the complete scenario package on September 28, 1990 for NRC review and evaluation. Region I representatives had telephone convers ations with the licensee's emergency preparedness staff to discuss the scope and content of the scenario. As a result, minor revisions were made to the scenario which allowed adequate testing of the major portions of the Millstone Point Unit No. 2 Emergency Plan and Implementing Procedures and also provided the opportunity for the licensee to demonstrate those areas previously identified by the NRC as in need of corrective action. NRC observers attended a licensee briefing on December 4, 1990. Suggested NRC changes to the scenario made by the licensee were discussed during the briefing. The licensee stated that certain emergency response activities would be simulated and that controllers would intercede in exercise activities to prevent disruption to normal plant activities.

2.2 Exercise Scenario

The exercise scenario included the following events:

- Initial conditi[illegible]s: Unit 2 is in a refueling outage. Steam generator nozzle dams are being installed. The containment equipment hatch is open. One diesel electric generator is undergoing overhaul. The main and normal station service transformer are tagged out.

- Reactor coolant leakage from the hot leg nozzle dam increases significantly.

- The fuel transfer tube isolation valve between the spent fuel pool and the refueling cavity cannot be closed.

- Declaration of an Alert (radiation levels greater than 1000 times normal for more than five minutes);

- A fire occurs in the A diesel generato[illegible] room taking that diesel out of service.

- Declaration of a Site Area Emergency (fire affecting safety systems);

- Failure of the plant process computer and Offsite Based Information System (OFIS);

- Declaration of a General Emergency (Unit 2 black-out expected to last for more than two hours);

2.3 Activities Observed

During the conduct of the licensee's exercise, NRC inspection team members made detailed observations of the activation and augmentation of the Emergency Response Facilities and the Emergency Response Organization staff and actions of the Emergency Response Organization staff during operation of the Emergency Response Facilities. The following activities were observed:

- Recognition of symptoms by the control room operators;

- Correct use of control room procedures;

- Detection, classification, and assessment of scenario events;

- Direction and coordination of emergency response;

- Notification of licensee, Connecticut State Government personnel and personnel

of the surrounding Towns, and communication of pertinent plant status information to State personnel;

- Communications/information flow, and record keeping;

- Assessment and projection of off-site radiological dose and consideration of protective actions;

- Accident analysis and mitigation including efforts to isolate the spent fuel pool from the refueling cavity, repair of a faulty circuit breaker to restore site power, and fire fighting efforts.

3. Classification of Exercise Findings

Emergency preparedness exercise findings are classified as follows.

Exercise Strengths

Exercise strengths are areas of the licensee's staff response that provide strong positive indication of their ability to cope with abnormal plant conditions and implement the emergency plan implementing procedures.

Exercise Weaknesses

Exercise weaknesses are areas of the licensee's response in which the performance was such that it could have precluded effective implementation of the emergency plan implementing procedures in the event of an actual emergency in the area being observed. Existence of an exercise weakness does not of itself indicate that overall response was inadequate to protect public health and safety.

Areas for Improvement

An area for improvement is an area which did not have a significant negative impact on the licensee's ability to implement the emergency plan implementing procedures and response was adequate. However, it should be evaluated by the licensee to determine if corrective action could improve performance.

4. Exercise Observations

The NRC team noted that the licensee's activation of the Emergency Response Organization, Emergency Response Facilities, and use of these facilities were generally consistent with their Emergency Plan and Emergency Plan Implementing Procedures. The following strengths, and areas for improvement were identified.

4.1 Control Room

The following exercise strengths were identified.

- Efforts to mitigate loss of coolant by cross connecting Unit 1 instrument air system to provide air to the leaking nozzle dam.

- Efforts to isolate the containment by installation of the equipment hatch before the Operations Support Center was activated.

- Planning to cross-connect the electrical system to Unit 1 before the remaining diesel electric generator was lost.

- Constructive involvement by the Duty Officer with the control room operators.

No exercise weaknesses were identified.

The following areas for improvement were identified.

- Implementation of the following control room procedures could have been performed more expeditiously: Abnormal Operating Procedure (AOP) 2578 "Lowering of Refuel Cavity or Spent Fuel Pool Levels"; Emergency Operating Procedure 2528 "Electric Emergency"; and, verification of actions per AOP 2579G.

- A generic AOP was used to respond to the fire in the diesel electric generator room, however there was no follow-up using the specific diesel generator room fire procedure which was available.

- Operators did not actively pursue determination of reactor vessel water level during drain down by verification of hot leg level indications.

- The control room did not keep the other Emergency Response Facilities informed regarding the fact that high pressure safety injection pumps, low pressure pumps and charging pumps had been restarted after electric power had been restored.

- The control room log for the exercise was maintained on loose sheets of paper and not in a formal log.

4.2 Technical Support Center

The following exercise strengths were identified.

- Very good boration calculations were performed by a Unit 3 engineer.
- Excellent support was provided to the control room and the Emergency Operations Facility in eleven functional areas.
- Potential problems that could occur were anticipated.

No exercise weaknesses were identified.

The following area for improvement was identified.

- Beginning of core life curves were the only ones available for use in analyzing a situation that involved an end of core life problem.

4.3 Operations Support Center (OSC)

The following exercise strengths were identified.

- Good team briefings were conducted, particularly for the manway repair team.
- The manway cover was reinstalled very quickly.
- Mission dose control techniques were very good.
- Very good briefings were conducted for the fire brigade and proper dosimetry was provided for their use.

No exercise weaknesses were identified.

The following areas for improvement were identified.

- The plant page system was not audible at the North Access Point.
- Trouble shooting procedures were not available for the work on the breaker.

4.4 Emergency Operations Facility (EOF)

The following exercise strengths were identified.

- There was good consideration of alternative actions that could be taken to seal the manway and use of mechanical means to move the refueling pool gate into position when electric power was lost.

- There were good recommendations on alternative methods to refill the spent fuel pit.

No exercises weaknesses were identified.

The following area for improvement was identified.

- The EOF Communicator did not maintain a log.

4.5 Corporate Emergency Operations Center

The following exercise strengths were identified.

- The Radiological Engineer recognized the similarity of the scenario to the real world event at the Haddam Neck plant when the cavity seal failed in 1984.

- The marine Environmental Monitoring Team was recalled when rough seas posed a possible safety threat.

- Time to uncover fuel in the refueling pool due to boil-off of the water was estimated using realistic heat loads from spent fuel.

- Reactor vessel water temperature was hand calculated assuming no natural convection cooling. Uncertainty arose when it was learned the time of nozzle dam failure originally given was incorrect. Revised time estimates indicated mid-loop conditions were not attained. The staff consulted NUREG-1269, "Loss of Residual Heat Removal System", Diablo Canyon, Unit 2, 1987 and their response to NRC Generic Letter 88-17.

No exercise weaknesses were identified.

The following areas for improvement were identified.

- Log books and status boards were not current at all times. If they had been, one false start might have been averted.

- The Technical Support area was originally overcrowded and noisy. Due to the proliferation of plans and procedures work space was almost exhausted.

4.6 Other Findings

The recently installed computerized notification and verification system worked very well. Rapid notification of and verification from licensee and government staff on call was made. The Incident Report Form was also transmitted using this system. Licensee staff was effectively trained in it's use.

5. Licensee Critique

The NRC team attended the licensee's exercise critique on December 5, 1990 during which the licensee's lead controllers and observers discussed observations of the exercise. The licensee's critique was acceptable, however more time could have been spent identifying and discussing areas which could be improved. For example, the delay in entering an EOP and not using a unit specific EOP to verify the use of a generic EOP were not noted.

6. Exit Meeting

Following the licensee's exercise self-critique, the NRC team met with the licensee's representatives listed in Section 1 on December 6, 1990 to discuss findings as detailed in this report. The NRC team leader summarized the observations made during the exercise. The licensee was advised no exercise weaknesses were identified. The NRC team also determined that within the scope and limitation of the scenario, the licensee's performance demonstrated the capability to implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner that would adequately provide protective measures for the health and safety of the public.