

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-293/84-20

Docket No. 50-293

License No. DPR-35

Priority --

Category C

Licensee: Boston Edison Company M/C Nuclear  
800 Boylston Street  
Boston, Massachusetts 02199

Facility Name: Pilgrim Generating Station

Inspection At: Plymouth, Massachusetts

Inspection Conducted: August 14-16, 1984

Inspectors:

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10-1-84  
date

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Inspection Summary:

Inspection on August 14-16, 1984, Report No. 50-293/84-20

Areas Inspected: Special announced emergency preparedness inspection and observation of the licensee's annual emergency exercise performed on August 15, 1984. The inspection involved 162 inspector-hours by a team of seven NRC Region I and NRC contractor personnel.

Results: Although the licensee's emergency response actions for this exercise were adequate to provide protective measures for the health and safety of the public, a remedial drill is necessary in order to retest certain deficiencies. Correction of such deficiencies will increase the licensee's overall emergency response capability.

## DETAILS

### 1. Persons Contacted

The following licensee representatives attended the exit meeting on August 16, 1984:

J. P. Aboltin, Acting Chief Technical Engineer  
W. J. Armstrong, Assistant to Vice President - Operations  
C. E. Bowman, Senior Radiological Engineer  
M. N. Brosee, Chief Maintenance Engineer  
W. H. Deacon, Assistant to Senior Vice President - Nuclear  
L. Dooley, Nuclear Training Specialist  
B. Eldredge, Assistant C.R. Engineer  
J. M. Fulton, Staff VPNO  
E. T. Graham, Compliance Group Leader  
W. R. Hoey, Senior Radiation Protection Engineer  
M. T. Lenhart, Licensing Engineer  
B. P. Lunn, Health Physics Engineer  
P. E. Mastrangelo, Chief Operations Engineer  
C. J. Mathis, Nuclear Operations Manager  
J. J. McClellan, Senior Radiological Engineer  
A. V. Morisi, Nuclear Management Services Manager  
B. V. Nolan, Emergency Preparedness Coordinator  
A. L. Oxsen, Vice President Nuclear Operations  
T. L. Sowdon, Environmental and Radiological Health and Safety G.L.  
R. J. Tis, Public Information Officer  
A. R. Trudeau, Chief, Radiological Engineer  
S. S. Wollman, Acting Onsite Safety & Performance G.L.  
E. J. Ziemianski, Nuclear Operations Support Manager

The team observed and interviewed several of the above licensee emergency response personnel, controllers, and evaluators as they performed their assigned functions during the exercise.

### 2. Emergency Exercise

The Pilgrim Generating Station's small scale exercise was conducted on August 15, 1984 from 7:45 a.m. until 3:00 p.m.

#### a. Pre-exercise Activities

NRC Region I representatives had limited telephone conversations with licensee representatives to discuss and review the scope and content of the exercise scenario. Although several aspects of the scenario were deficient, only minor revisions were made by the licensee. Examples of specific deficiencies which were found included:

- exercise objectives too general in nature

- absence of a definitive scenario time line
- inadequate information for player use regarding expected personnel actions on operational assessment, dose assessment, environmental monitoring, and activities for each emergency response facility.
- lack of specific controller messages
- incomplete description of plume direction, meteorological conditions, calculated doses, dose projections, protective action recommendations for the whole exercise.

NRC observers attended a licensee briefing for licensee controllers and observers on August 16, 1984, and participated in the discussion of emergency response actions expected during the various phases of the scenario. The licensee stated that certain emergency response activities would be simulated and that controllers would intercede in activities to prevent either scenario deviation or disturbing normal plant operations.

The exercise scenario included declaration of each emergency classification due to the following events:

- Unusual Event - loss of power to operated valves necessitating plant shutdown.
- Alert - reduction of heat transfer capacity and main condenser vacuum caused by an offshore oil spill entering into plant systems and potentially impairing ECCS capability.
- Site Area - draining of reactor water into the reactor building resulting in elevated radiation readings and offsite dose projections in excess of EPA protective action guidelines.
- General Emergency - decrease in reactor water level and loss of core spray pumps resulting in fuel damage.

The above events caused the activation of the licensee's on-site emergency organization and emergency response facilities.

b. Exercise Observation

During the conduct of the licensee's exercise, NRC team members made detailed observations of the activation and augmentation of the emergency organization; activation of emergency response facilities; and actions of emergency response personnel during the operation of the emergency response facilities. The following activities were observed:

- (1) Detection, classification, and assessment of the scenario events;
- (2) Direction and coordination of the emergency response;

- (3) Notification of licensee personnel and offsite agencies of pertinent information;
- (4) Communications/information flow, and record keeping;
- (5) Assessment and projection of radiological dose and consideration of protective actions;
- (6) Provisions for in-plant radiation protection;
- (7) Performance of offsite and in-plant radiological surveys;
- (8) Maintenance of site security and access control;
- (9) Performance of technical support;
- (10) Performance of repair and corrective actions;
- (11) Performance of first aid and rescue; and
- (12) Assembly and accountability of personnel.

The NRC team noted that the licensee's activation and augmentation of the emergency organization; activation of the emergency response facilities; and actions and use of the facilities were generally consistent with their emergency response plan and implementing procedures. The team also noted the following actions of the licensee's emergency response organization that were indicative of their ability to cope with abnormal plant conditions:

- Personnel in the Control Room, TSC, and EOF aggressively sought to control and rectify degraded plant conditions.
- Improvements in use of the TSC as an emergency response facility were found regarding location, size, work space, and available equipment.
- The OSC coordinator was found to be an effective leader and provided timely status updates to all OSC personnel.

The NRC team findings in areas identified as requiring improvement were found to recur from previous assessments as follows:

- Provide written messages for controllers to use regarding plant conditions rather than verbal messages which creates discussion between players and controllers.
- Personnel briefings were not conducted by either the Emergency Director or his alternate in the EOF regarding plant status, radiological conditions, protective action recommendations.

- Status boards were neither adequate nor maintained in the EOF to provide current (and accurate) emergency conditions and radiological information.
- The use of the EOF as an emergency response facility is inefficient in fulfilling its function. Space limitations, unsatisfactory habitability conditions, excessive noise, location of NRC and State areas and equipment, inhibited access to key licensee personnel, high temperatures, crowding are examples of facility deficiencies.
- No formal system of record keeping or facsimile capability to provide protective action recommendations, data transmission, plant parameters to appropriate emergency centers was found in the EOF.
- Offsite monitoring team transmissions did not include open window radiation measurements for comparison with closed window measurements.
- Emergency response facilities and offsite monitoring teams were not provided with information regarding class of emergency that was being made available to the public.
- Containment high radiation monitors were not operable; one monitor is known to be inoperable since January 1983.

The NRC team findings in areas for licensee improvement were as follows:

- Declaration of the site area emergency was not made until approximately one hour after effluent data was received.
- Although control room personnel were observing a continuous rise in reactor building dose rates, the decision for evacuation did not occur until dose rates were greater than 300 mR/hr.
- For approximately one hour, the Watch Engineer was not aware that the station manager had relieved him of the Emergency Director position.
- Control room communicators did not appear familiar with use of radio equipment for contacting the State Police and Coast Guard and required unnecessary guidance from the Operations Supervisor.
- The TSC supervisor indicated to the Watch Engineer that the TSC was fully activated before several essential technical support personnel (reactor engineer, chemistry engineer, electrical engineer, health physics engineer, administrative assistant) had arrived.

- TSC radiation levels and airborne activity levels were not monitored in the TSC until one hour after a reading of 10,000 cps was reported on the vent monitor.
- The need to perform initial dose calculations was neither recognized nor performed in a timely manner, i.e., after iodines had been released through the reactor building vent.
- The Emergency Director did not recognize the need to dispatch offsite radiological monitoring teams following the radioactive release.
- An official control room log was not initially provided and maintained in adequate detail to allow reconstruction of events after they occurred.
- The health physics and chemistry technicians dispatched to obtain a main stack sample did not follow the step-off pad procedure upon leaving the building.
- The OSC was supplied with "information only" copies of piping and instrument drawings (P&ID) instead of controlled copies. Information and procedures which are not current or are unapproved could impact on an actual incident were it to occur.
- A premature decision was made by the lead controller to intervene and discontinue the investigation of an inoperable sample pump report in that sufficient time was not left to the players to evaluate data transmissions.
- The logistical adequacy of the new Operations Support Center as indicated in the exercise objectives was not demonstrated.
- Communications between the EOF and the offsite monitoring teams should be improved in order to provide teams with more useful direction and keep each team informed of plant and plume conditions.
- An offsite team did not pursue the opportunity to find the plume centerline.
- The internal organization of the EOF was not conducive for organized information flow.
- Personnel responsible for maintaining EOF status boards provided information that was observed to be incorrect, incomplete, misleading and delayed.
- Direction and control provided by the Emergency Director in the EOF was lacking; protective action recommendations to the State were not made until prompted by MPHD officials.

- Radiological data (e.g. dose protections) were not evaluated and discussed among key EOF staff members prior to relating recommendations for protective measures to the State.

The NRC team attended the licensee's post-exercise critique during which key licensee controllers discussed their observations of the exercise. The licensee participants highlighted areas for improvement which the licensee indicated would be evaluated and appropriate action taken.

### 3. Areas of Concern Warranting Remedial Actions

Based upon our observations, we found that certain licensee emergency response actions identified during previous assessments were found to recur. In addition, other specific areas in need of improvement resulted from the licensee's response to the current exercise scenario. As a minimum, the following areas identified below should be evaluated by the licensee during a remedial drill for the purpose of retesting and providing an adequate demonstration of emergency response actions in order to continue to meet the standards of 10 CFR 50.47:

1. recognition of emergency initiating events
2. escalation and classification of emergency conditions in relation to EAL's
3. timely notifications to offsite authorities
4. calculation and estimation of projected doses and dose rates
5. determination and coordination of decision-making process for protective measures

### 4. Exit Meeting and NRC Critique

Following the licensee's self-critique, the NRC team met with the licensee representatives listed in Section 1. The team leader summarized the observations made during the exercise and discussed the areas described in Section 2.b.

The licensee was informed that no violations were observed and several areas were identified for improvement. The NRC team determined that within the scope and limitations of the scenario, the licensee's performance demonstrated that they could implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner which would adequately provide protective measures for the health and safety of the public. However, we also determined that a remedial drill was warranted to retest certain deficiencies associated with the licensee's dose assessment and decision-making processes.

Licensee management acknowledged the findings and indicated that appropriate action would be taken regarding the identified improvement areas.

At no time during this inspection did the inspectors provide any written information to the licensee.