

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-352/84-41

Docket No. 50-352

License No. CCPR-106 Priority -- Category B-1

Licensee: Philadelphia Electric Company

2301 Market Street

Philadelphia, PA 19101

Facility Name: Limerick Generating Station

Inspection At: Limerick, Pennsylvania

Inspection Conducted: July 24-27, 1984

Inspectors: *Nemen M. Terc*
Nemen M. Terc, Exercise Team Leader
EPS, DETP

8/28/84
date

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8/28/84
date

Inspection Summary: Inspection on July 24-27, 1984 - Report No. 50-352/84-41

Areas Inspected: Routine, announced emergency preparedness inspection and observation of the licensee's Emergency Exercise performed on July 25, 1984.

Results: The inspection involved 416 hours by a team of nine NRC inspectors and NRC contractor personnel. The licensee's emergency response actions for this exercise scenario were adequate to provide protective measures for the health and safety of the public. No violations were identified.

DETAILS1. Persons Contacted

The following licensee representatives attended the exit meeting on July 27, 1984:

James A. Basilio	Administrative Engineer
Vincent S. Boyer	Senior Vice President - Nuclear Power
M. J. Cooney	Manager Nuclear Production
R. J. Costagliola	Supervising Engineer
John B. Cotton	Maintenance Engineer
Shields L. Daltroff	Vice President - Electric Production
J. Doering	Operations Engineer
Richard W. Dubiel	Senior Health Physicist
P. J. Duca	Technical Engineer
J. F. Franz	Assistant Superintendent
Michael P. Gallagher	Site Emergency Planning Coordinator
A. J. Hogan	Staff Engineer - Emergency Coordinator
R. A. Kankus	Director - Emergency Preparedness
G. M. Leitch	Superintendent - LGS
R. H. Logue	Superintendent - Nuclear Services
J. W. Sabados	Supervisory Chemist
J. W. Spencer	Startup Director
W. T. Ullrich	Superintendent - Nuclear Generating Division
V. A. Warren	Test Engineer - Emergency Planning

2. Emergency Exercise

The Limerick Generating Station full scale exercise was conducted on July 25, 1984 from 10:00 a.m. until 12:00 p.m.

a. Pre-exercise Activities

Prior to the emergency exercise, NRC Region I representatives had telephone discussions with licensee representatives to review the scope and content of the exercise scenario. As a result, minor revisions were made by the licensee to modify radiological data.

In addition, NRC observers attended a licensee briefing for licensee controllers and observers on July 24, 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 disturbing normal plant operations.

The exercise scenario included the following events:

- Unidentified leak to the drywell
- Significant amount of fuel failure
- Large off-site releases of radioactivity
- Contaminated and injured individuals

The above events caused the activation of the licensee's emergency facilities and also permitted the state and counties to exercise their emergency plans. Additionally, the NRC response team assumed a full activation mode.

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 scenario events;
- (2) Direction and coordination of the emergency response;
- (3) Notification of licensee personnel and off-site agencies;
- (4) Communications/information flow, record keeping, and sample distribution;
- (5) Assessment and projection of radiological doses and protective actions recommendations;
- (6) Off-site, on-site and in-plant radiological surveys;
- (7) Technical support to operations;
- (8) Repair and corrective actions;
- (9) First Aid and rescue;
- (10) Assembly and accountability of personnel;
- (11) Radiological controls for emergency workers;
- (12) Security and access controls

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 plan and implementing procedures. The team also noted the following areas where the licensee's activities were thoroughly planned and efficiently implemented:

- The degree of realism and free-play during the exercise was well maintained.
- OSC Activities were well coordinated and directed. Status boards were kept up-to-date, personnel accountability in the OSC and during in-plant work was well maintained; plant status, radiological and technical briefings of in-plant repair teams at the OSC were good; dose exposures were controlled and communications between teams, OSC and TSC was properly maintained.
- Health physics and chemistry personnel assigned to perform in-plant sampling and analysis were proficient.
- Search and rescue team was efficient in locating the injured/contaminated individual. Medical care and radiological decontamination were promptly initiated.
- Record keeping in the TSC was orderly and accurate, and the chronology kept on a status board was simultaneously entered in a computer and relayed to the EOF. A validation system ensured that information was accurate.
- The Emergency Director in the TSC displayed appropriate command and control; his briefings to TSC supervisory emergency response personnel were organized, short and to the point.
- The Shift Technical Advisors (STAs) are well integrated into the emergency response organization in the Control Room, and were proficient in their role. The transfer of information and responsibilities between shifts, and briefings by the Shift Superintendent were excellent.
- Operators in the Control Room kept on top of plant status responding very well to the demands of the accident scenario.
- Access control to ERFs was effective.
- Communications and information flow (e.g. technical and radiological) between off-site teams and TSC and EOF were generally good.
- Personnel briefings were timely in the ERFs.
- Emergency response personnel were for the most part efficient and conscientious in carrying on their duties.

- Medical personnel at the hospital demonstrated efficient handling of injured/contaminated individual (e.g. contamination isolation, dose reduction practices).

The NRC Team findings in areas for licensee improvement were as follows: (the licensee identified many of these areas during their critique of the exercise)

- Security actions on-site resulted in unreasonable delays, reducing the efficiency of environmental monitoring teams (EMTs) (e.g. stopping and searching them). Security personnel controlling access to ERFs should have listings of emergency personnel and other persons expected.
- Discrepancies between EOF and EMTS sampling location maps were noted. This resulted in unnecessary confusion and loss of time.
- Ambulance personnel transporting injured/contaminated individual showed poor knowledge of radiological protection. The number used by hospital for telephone call verification was incorrect causing delay in rescue operation.
- Equipment and supplies inventories were not always correct (e.g. no plastic bags for contaminated samples.)
- A lack of appropriate on-site maps showing exit routes resulted in unnecessary radiation dose to on-site teams within the radioactive plume.
- The Field Survey Group Leader failed to provide useful directions to on-site team members (e.g. Status updates, stay times, personnel dose tracking)
- Record keeping pertaining to dose assessment was not amenable to reconstruction of events (e.g. lacked time, date, and proper identification). Dose Assessment Team Leaders (e.g. at EOF and TSC) were unable to (e.g. had little time to) maintain proper logs concerning decisions, messages and data.
- There was a two hour delay by emergency response managers in making a decision to terminate the release. This could have been accomplished by closing a valve, and making a proper evaluation of emergency worker risks (i.e. man-rem expenditure) against population doses.
- The TSC and EOF were too crowded. This resulted in communication difficulties within the ERFs necessitating frequent calls to keep the noise levels down. Although training of licensee personnel is desired, the keeping of unnecessary personnel (e.g. an additional shift) resulted in excessive noise levels, lack of realism, and made otherwise adequate ERFs too crowded.

- Personnel accountability for construction workers was slow. A search for a missing person took one hour. Apparently the individual had not heard (or identified) the evacuation signal.
- Personnel accountability of non-essential personnel was completed in 23 minutes, and resulted in 77 persons missing. It took a long time (83 minutes) to account for all missing persons. Tracking down was done by successive public address system announcements.
- In general, dose projection data was unnecessarily rushed to the Site Emergency Coordinator (SEC) in raw form and presented in equal manner to NRC and State officials. Critical data upon which protective actions were taken was not evaluated by the licensee prior to presentation. As a consequence, decision-making was not a coherent process, and protective action recommendations (PARs) did not rest on firm foundations.
- The EOF dose assessment personnel and SEC failed to consider available field measurements regarding actual radioactive conditions off-site. The decision making process to determine PARs did not take into account large discrepancies between theoretically projected doses and doses measured by field teams. The NRC observers noted considerable deviation in the dose assessment team in the light of these discrepancies (i.e., field measurements resulted in much lower doses to the population and could not in themselves justify an evacuation). There was no clearly defined policy or procedures to deal with such conflicting data.
- Confusion existed between EOF and TSC personnel in transferring responsibility for EMTs.
- Follow-up of certain actions was lacking (e.g. SEC forgot to request TSC to provide answers regarding continuing fuel failure; SEC did not confirm whether protective actions were taken).
- Assistant Emergency Director and Assistant SEC roles should be clarified in the emergency organization.
- Periodic briefings or meetings with supervisory organizational elements in the TSC and EOF should incorporate specific locations of significantly high off-site doses, what protective actions are on the way, status of plant conditions (e.g. current remedial actions); and the basis for dose projections.
- Hardware communications deficiencies were noted pertaining to conference calls among EOF, TSC and Control Room.
- The effectiveness of controllers was diminished when they had to simultaneously act as evaluators.

- Radio communications between the Control Room and the deployed fire brigade, and between the Operations Engineer in the Control Room and the Assistant Emergency Director in the TSC were not reliable.
- Training of replacements for Control Room Operators (e.g. maintenance, Instrument and Control personnel) acting as fire brigade should be considered to prevent depleting of the Operations Staff, since their absence could be critical to reactor plant operation.
- The reason behind a 21 minute delay by the Montgomery County fire department for initiating support actions should be investigated.
- A formal protocol is needed for conveying and verifying information (e.g. whether actions would be taken, or to verify that they were taken). This protocol would be useful for emergency response managers to avoid failures in information flow.
- Arrangements should be made to ensure that at any time, the minimal staff of the TSC includes a person with an operating license.
- Notifications of the NRC Emergency Operations center was not made by the licensee for the Alert, Site Area or General Emergency classifications.
- Investigate the reason for a spurious site evacuation which started at 11:30 a.m.
- The power supply to the OSC appeared to be insufficient to handle the load of emergency response related equipment. This was evident by the significant drop in flow-rate through air sampler when an Eberline PING unit was also connected to the same electrical circuit.
- Consider revising Paragraph 9.1.1.3 of EP-104 which calls for the communicator to continuously stay on the line with NRC. This practice could hamper the functions of the communicator in support to the Emergency Director.

c. Exercise Critique

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. 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 although there were areas 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.

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.