U. S. Nuclear Regulatory Commission
Region I

Docket/Report:	**50-334/94-01 and 50-412/94-01**
License:	**NPF-66 and NPF-73**
Licensee:	**Duquesne Light Company** **Post Office Box 4** **Shippingport, Pennsylvania 15077**
Facility Name:	**Beaver Valley Power Station**
Inspection:	**February 14-17, 1994**
Inspection At:	**Shippingport, Pennsylvania**

Inspectors: _____ 2/24/94
J. Laughlin, Emergency Preparedness Specialist date

J. Lusher, Emergency Preparedness Specialist
W. Maier, Emergency Preparedness Specialist
L. Rossbach, Senior Resident Inspector
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S. Boynton, NRR/PEPB

Approved: _____ 2/24/94
R. Keimig, Chief, Emergency Preparedness Section date

Areas Inspected

The licensee's annual, full-participation exercise conducted on February 15-16, 1994.

Results

Exercise performance was very good and demonstrated that the onsite emergency plan and procedures for the facility met NRC requirements and that the plant staff is capable of implementing them. Exercise strengths included Emergency Director command and control, technical support from the Technical Support Center, and liaison with State representatives in the Emergency Operations Facility. No exercise weaknesses were identified. A previously identified outstanding item in the area of protective measures for field teams was closed.

DETAILS

1.0 Persons Contacted

The following individuals attended the exit meeting on February 17, 1994.

R. Brosi, Manager, Emergency Preparedness Planning (EPP)
E. Chatfield, General Manager, Nuclear Support
E. Cohen, Director, Radiological Operations, Unit 2
E. Coholich, Senior Licensing Supervisor
R. Gernat, Quality Assurance Specialist
D. Girdwood, Director, Radiological Operations, Unit 1
M. Johnston, Manager, Nuclear Security
D. Kline, Director, Nuclear Security Operations
S. LaVie, Senior Health Physics Specialist
J. Matsko, Manager, Outage Management
G. McKee, Emergency Preparedness Specialist, EPP
R. Moser, Health Physics Associate, EPP
D. Orndorf, Chemistry Manager
K. Ostrowski, Unit 1 Operations Manager
J. Sasala, Director, Nuclear Communications
B. Sepelak, Licensing Engineer
J. Sieber, Senior Vice President and Chief Nuclear Officer
R. Snyder, Westinghouse Site Representative
D. Spoerry, Vice President, Nuclear Operations
J. Starr, Supervisor, Engineering Management
H. Szklinski, Health Physics Specialist, EPP
G. Thomas, Vice President, Nuclear Services
N. Tonet, Manager, Nuclear Safety

The inspectors also interviewed other licensee personnel.

2.0 Emergency Exercise

The Beaver Valley Power Station conducted a full-participation exercise starting on February 15, 1994, at 6:00 p.m. The exercise concluded at 1:00 a.m. on February 16th. The Commonwealth of Pennsylvania and the States of Ohio and West Virginia participated. The Federal Emergency Management Agency evaluated the response of the states and other offsite agencies.

Exercise objectives were submitted to NRC Region I on November 9, 1993. The complete scenario package was submitted on December 10, 1993. Following NRC review of the submitted scenario, Region I representatives had telephone conversations with the licensee's EP staff to discuss the scope and content of the scenario. Minor revisions were made to the scenario to enhance testing of the major portions of the Beaver Valley Power Station Emergency

Plan and Implementing Procedures. The scenario also provided the opportunity for the licensee to demonstrate the areas previously identified by the NRC as in need of corrective action.

NRC observers attended a February 14, 1994 licensee briefing on the revised scenario. The licensee stated that certain emergency response activities would be simulated and that controllers would intercede in exercise activities to prevent disrupting normal plant activities.

3.0 Activities Observed

The NRC observed the activation and augmentation of the Emergency Response Facilities and actions of the Emergency Response Organization staff. The following were observed:

1. Selection and use of control room procedures
2. Detection, classification, and assessment of scenario events
3. Direction and coordination of emergency response
4. Notification of licensee personnel and offsite agencies
5. Communications/information flow, and record keeping
6. Assessment and projection of offsite radiological doses
7. Protective action recommendations
8. Maintenance of site security and access control
9. Performance of technical support, repairs and corrective actions
10. Provisions for communicating information to the public
11. Accident analysis and mitigation
12. Accountability of personnel
13. Post-exercise critique by the licensee

4.0 Exercise Finding Classifications

Emergency preparedness exercise findings were classified as follows:

Exercise Strength: A strong positive indicator of the licensee's ability to cope with abnormal plant conditions and implement the Emergency Plan.

Exercise Weakness: Less than effective Emergency Plan implementation which did not of itself constitute overall response inadequacy.

Area for Improvement: An aspect which did not significantly detract from the licensee's response, but which merits licensee evaluation for corrective action.

5.0 Exercise Observations

Activation and utilization of the Emergency Response Organization and Emergency Response Facilities (ERFs) were consistent with the Emergency Plan and Emergency Plan Implementing Procedures. The presence of Mr. J. Sieber, Senior Vice President and Chief Nuclear Officer,

in the ERFs during the exercise, and his comments at the licensee critique, demonstrated management attention to EP. The following sections provide observations made by the inspection team during the exercise in the various ERFs.

6.0 Control Room (CR)

The Nuclear Shift Supervisor (NSS) made accurate event classifications for the Unusual Event and the Alert. Notifications to local agencies and the NRC were completed within allowed time limits. Staff technical recommendations were very good and indicated an in-depth understanding of plant design and operation. The Shift Technical Advisor did a thorough job of evaluating critical safety functions. The turnover between the NSS and the relieving Emergency Director (ED) was very thorough and in accordance with the Emergency Plan Implementing Procedures. Overall, the CR staff responded well to simulated plant events.

Communications between personnel in the CR, the Technical Support Center (TSC) and the Operations Support Center (OSC) were good. However, the NSS often unnecessarily duplicated the information passed to the TSC instead of allowing the Operations Coordinator to handle information flow. This resulted in the NSS spending more time than necessary on the telephone, and had the potential to distract him from his plant control duties. This was identified by the inspection team as an area for improvement.

7.0 Technical Support Center (TSC)

The TSC was activated 53 minutes after the Alert declaration. The TSC Coordinator and the backup ED verified that the TSC was ready for activation prior to the arrival of the relieving ED from the CR. The ED promptly and correctly declared the Site Area Emergency (SAE) within four minutes of the initiating event. The required notifications to State and local officials were completed expeditiously within allowed time limits. Accountability was begun at the SAE declaration and completed within 22 minutes.

The ED conducted frequent, informative briefings for the TSC staff. The staff continually assessed plant conditions and the status of repair efforts, and kept the ED informed. The ED changed repair priorities, when necessary, and communicated these changes to the ERFs. The ED demonstrated excellent command and control, which was identified by the NRC as an exercise strength.

The TSC staff provided excellent technical support to the ED for mitigation of the simulated radiological emergency. The backup ED evaluated plant events in light of the Emergency Action Levels to identify possible approaching General Emergency (GE) conditions. Maintenance and radiological controls coordinators continually assessed in-plant repair activities and offered possible solutions. Engineering personnel calculated the time available before spent fuel pool boiling would occur, an event in the scenario. The TSC staff also recognized that the indication of a large differential pressure across the "C" Steam Generator

(S/G) tubes was a problem and established reactor coolant system (RCS) depressurization as a top priority. The technical knowledge demonstrated was critical in performing effective mitigation actions and was also assessed by NRC inspectors as an exercise strength.

The GE was declared 17 minutes after the "C" S/G tube rupture and a hi-hi radiation alarm from the steam generator steam relief effluent monitor. The tube rupture resulted in the failure of the RCS fission product barrier since the "C" S/G was already failed outside containment due to a stuck open safety valve. The possibility of fuel damage existed from an earlier anticipated transient without scram (ATWS). After the tube rupture, the ED could have declared a GE in accordance with EPP/I-1, Tab 6, *Ruptured S/G is also faulted (outside of containment) and indication of damaged fuel exists*. However, he was slow to declare the GE due to his inability to determine whether fuel damage had occurred. The inspectors concluded that fuel damage verification was delayed because: 1) the scenario did not provide sufficient radiation monitoring data to support an assessment of fuel damage, and 2) the input of the Environmental Assessment and Dose Projection Coordinator was not given adequate weight in the assessment (he recognized that the high radiation readings on the S/G steam relief effluent monitor meant probable fuel damage). The delay in the GE declaration was identified by the NRC as an area for improvement.

8.0 Operations Support Center (OSC)

The OSC was activated 22 minutes after the Alert declaration. Personnel accountability was good and used the OSC/EPP Assignment Sheets, which tracked repair tasks, individuals assigned, and accumulated radiation dose. The OSC Coordinator (OSCC) and Supervisor demonstrated good command and control. The OSCC kept facility personnel informed of plant events through timely briefings. Good communications were maintained with other ERFs. Damage control teams (DCTs) were appropriately briefed and debriefed concerning assignments.

Controllers had difficulty in responding to players' actions when those actions could have resulted in equipment repair before the scenario allowed it. They sometimes artificially prevented participants from completing repair tasks and then suddenly allowed their completion when the scenario timeline allowed. There was also some duplication of repair efforts between the CR and the OSC. Both centers dispatched personnel to the same repair location resulting in confusion as to which center was in charge of DCTs. These were identified to the licensee as areas for improvement by the inspection team.

The noise level in the OSC made communications difficult for phone talkers, particularly at the beginning of the event when large numbers of people were assembled.

A habitability check in the OSC was done at 11:51 p.m., 1.5 hours after a radiation release started. The release did not affect personnel safety since the OSC is inside the self-contained ventilation envelope of the CR. Additionally, the radioactive plume did not touch down onsite.

9.0 Radiological Operations Center (ROC)

ROC management was good. Damage control teams (DCTs) were briefed thoroughly on existing radiological hazards and appropriate precautions. OSC Assignment Sheets provided ROC managers with useful information on DCT assignments. However, the DCT assigned to investigate the fuel pool cooling pump failure did not receive adequate information to carry out its assignment. This led to delays in performing repair actions.

ROC personnel frequently checked and updated repair priorities. On one occasion the ROC status board did not show the correct DCT size for an assigned team. Responders demonstrated appropriate in-plant monitoring and habitability surveys.

The Emergency Squad, medical, radiological controls, and security personnel response to a contaminated injured person event was good. Responders demonstrated good health physics practices to prevent the spread of contamination. There was a slight delay in the arrival of the ambulance due to a minor communications problem in the Control Room.

10.0 Emergency Operations Facility (EOF)

The EOF was staffed promptly and efficiently following the Alert declaration. The Emergency Recovery Manager (ERM) declared the EOF activated within 30 minutes of the Site Area Emergency (SAE) declaration. Facility management and control were effective. The ERM and his area coordinators conducted timely briefings to keep the EOF staff informed of changing conditions.

The ERM and ED had frequent discussions concerning event classifications. They often referred to Emergency Action Levels in order to prepare for a possible classification upgrade. The ERM concurred with the ED on the SAE declaration at 8:28 p.m., and the GE declaration at 10:32 p.m. State representatives in the EOF were appropriately notified of the GE declaration.

The ERM and his staff considered both plant conditions and projected radiological doses in developing the protective action recommendation (PAR) for the GE. The issued PAR was for the evacuation of the entire ten-mile emergency planning zone. This was based on a projected child thyroid committed dose equivalent (CDE) of greater than 5 R (8.1 R) at five miles from the site, and a projected wind shift to the north. The ERM discussed the PAR at length with State representatives in the EOF. NRC observers considered the PAR appropriate to protect public health and safety. State representatives also discussed protective action (PA) implementation with the ERM and his staff and PA decisions were prominently displayed on status boards in the EOF.

A licensee State Liaison staff person was assigned to the EOF to facilitate licensee/State interaction. EOF area coordinators discussed plant events with State officials during regular briefings. The ERM discussed the PAR basis with them. The licensee interaction with

representatives from the Commonwealth of Pennsylvania, and the States of Ohio and West Virginia was excellent and was identified by the NRC as an exercise strength.

10.1 Environmental Assessment and Dose Projection (EA&DP)

The EA&DP team was properly activated in accordance with Section 5.2.7 of the Emergency Plan within 20 minutes of the Alert declaration. The EA&DP Coordinator demonstrated strong management of the team by directing proactive analyses as plant conditions changed. The team calculated accurate dose projections based on the release via the main steam safety valve and provided them to the ERM in a timely manner. The EA&DP coordinator also frequently communicated with State officials to explain team calculations.

Offsite monitoring teams effectively tracked and measured dose levels in the radioactive plume and their results confirmed the licensee's dose projections. Shortly after the release, discussions concerning radioiodine were held and EA&DP recommended that field monitoring teams take potassium iodide for thyroid blocking. Overall, the EA&DP team functioned well together and demonstrated a high level of competence.

10.2 Recovery Operations

At the conclusion of the exercise, the ED conducted a recovery discussion with key TSC and EOF staff using the checklist in EPP/IP 6.2, *Termination of the Emergency and Recovery*. Criteria for terminating the declared emergency and restoring the plant to normal operation were discussed.

11.0 Licensee Action on Previously Identified Items

CLOSED (IFI 50-334/92-14-02) Communication of field team data and consideration of potassium iodide for licensee field teams.

This was effectively demonstrated. Licensee staff discussed the issue of radioiodine at length and the potential need for potassium iodide (KI) useage. A field team air sample confirmed high levels of radioiodine offsite and KI was authorized for field team use. Therefore, this item was closed.

The following areas for improvement identified during the previous annual emergency exercise (Inspection Report Nos. 50-334,412/93-03) were resolved as follows:

1) Emergency Squad coordination of a personnel injury
2) health physics practices during a contaminated person event

These were observed to be markedly improved during the contaminated injured person event (see Detail 8.0) and the inspectors had no further questions on them.

3) OSC/ROC procedures were too general

The licensee revised procedure EPP/IP 1.5, *Emergency Support Centers (OSC & ROC) Activation, Operation and Deactivation*, which provided more detail to responders including checklists. This revision was assessed as adequate.

12.0 Licensee Critique

On February 17, 1994 the NRC team attended the licensee's exercise critique. The lead controller summarized key issues, followed by the observations of functional area lead controllers. Findings were characterized as strengths and weaknesses. The critique was appropriately self-critical, identified most NRC findings, and was assessed by the NRC team as a good self-evaluation.

13.0 Exit Meeting

Following the critique, the inspectors met with the licensee personnel listed in Detail 1.0 to discuss the inspection findings. The team leader summarized NRC observations. The licensee was informed that:

- Overall, the onsite response to this exercise was very good, demonstrating effective implementation of the Emergency Plan and Procedures.
- There were three exercise strengths, four areas for improvement, and no weaknesses.
- Previously identified item IFI 50-334/92-14-02, was closed.

Licensee management acknowledged the NRC findings.