U. S. NUCLEAR REGULATORY COMMISSION

# REGION III

Reports No: 50-237/93002(DRS); No. 50-249/93002(DRS)

Docket Nos: 50-237; 50-249 Licenses No: DPR-19; DPR-25

Licensee: Commonwealth Edison Company Executive Towers West III 1400 Opus Place-Suite 300 Downers Grove, IL 60515

Facility Name: Dresden Nuclear Power Station Units 2 and 3

Inspection At: Morris, Illinois

Inspection Conducted: January 11-15 and February 18-22, 1993

Inspector: 7 Jallon Sri for D/Schrum

<u>3-2-93</u> Date

Approved By:

T.J. Jablonski, Chief Maintenance and Outages Section

<u>3-2-93</u> Date

## Inspection Summary

<u>Inspection on January 11-15 and February 18-22, 1993 (Reports No. 50-237/93002(DRS), No. 50-249/93002(DRS))</u>

<u>Areas Inspected:</u> Routine fire protection inspection of surveillances, equipment, fire brigade training and drills, zebra mussel problems, and fire protection audits. The inspector utilized selected portions of NRC inspection procedures 64704 and 92702.

<u>Results:</u> Steady improvements continued in the fire protection program. Overall, the fire protection program was considered good. The staff was knowledgeable and had taken appropriate actions to correct issues and problems. Strengths included correcting hardware deficiencies, performing surveillances, and training of fire brigade members. Fire doors and transient combustibles were well controlled. Critiques of fire brigade drills were performed well. Control of fire protection concerns was adequate in the area of plant modifications. Reliability and material condition of the diesel driven fire pumps was poor. Preventive maintenance was being increased and the pump/engines were being considered for replacement. Concerns were identified with the reliability of the Unit 1 loop fire main and the overuse of repetitive checklists during audits. 

#### Persons Contacted

#### Commonwealth Edison Company (CECo)

- \*R. Black, Assistant Fire Marshal
- E. Carroll, Regulatory Assurance
- \*L. Cartwright, Assistant Technical Staff Supervisor
- \*A. D'Antonio, Supervisor Quality Verification
- \*M. Dillion, Fire Marshal
- \*R. Flahive, Technical Superintendent
- \*B. Gurley, Regulatory Assurance
- \*K. Housh, Technical Staff Fire System Engineer
- \*J. Kotowski, Operations Manager
- \*D. Mershon, Technical Staff Fire Protection Engineer
- M. Nagle, Fire Brigade Instructor
- \*D. Roberts, Corporate Fire Protection Engineer
- R. Stachniak, Operating Engineer
- D. Winchester, Internal Audit Group Superintendent

U. S. Nuclear Regulatory Commission (NRC)

M. Leach, Senior Resident Inspector M. Peck, Resident Inspector

\*Denotes those individuals attending the exit meeting on February 22, 1993.

#### Routine Fire Protection Program Review (64704)

This inspection consisted of observations of plant areas and reviews of fire protection surveillances, maintenance on fire protection equipment, fire brigade training and drills, fire reports, deviation reports, work requests, safety evaluations, controls to prevent bio-fouling by zebra mussels, and audits of fire protection activities.

## 2.1 <u>Observation of Plant Areas</u>

The inspector observed several areas of the reactor building and turbine building. The observation included hose stations, extinguishers, sprinkler valves, emergency lights, and housekeeping. The inspector determined that the equipment was being maintained in good condition. Housekeeping was excellent prior to the outage, although housekeeping could have been improved during outage activities. For example, rags were left in work areas and large quantities of anti-contamination clothing were allowed to accumulate. The majority of the wood used during outage activities was treated to make it fire resistant. Fire resistant plastic was also being used. Lubricants and oils were properly stored in fire resistant cabinets or in steel

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containers. Equipment areas were mostly free of oil as the result of equipment leaks. Appropriate controls for cutting and welding operations were being enforced. No discrepancies were noted with sprinklers or with fire main valves or headers. Halon bottles were at appropriate pressures and fire extinguishers had been inspected and had a current inspection date. No areas were noted where sprinklers should have been installed but were not already in place. Controls were being maintained for transient combustibles and fire doors. All fire doors were functional and temporary outage cables had been routed to ensure that the fire doors were operable.

## 2.2 <u>Surveillances</u>

The inspector reviewed completed surveillance procedures for 1992. The surveillances were performed accurately and on time. The observations and discrepancies were corrected with the exception of the Unit 2/3 diesel fire pump. Numerous engine and pump problems were noted in surveillances DFPP 4123-5, "Unit 2/3 Diesel Fire Pump Weekly Operability." The licensee was making efforts to better utilize surveillance resources based on risk and failure rate of equipment, which helped make resources available for other efforts.

## 2.3 <u>Maintenance on Fire Protection Equipment</u>

## 2.3.1 <u>Diesel Fire Pumps</u>

The diesel fire pumps (DFP) were poorly maintained. Very little preventive maintenance (PM) was done. Maintenance history showed that the DFPs had a large number of failures during the 1990 to 1993 time period. The repair data indicated that the DFPs went from failure to failure without any overall corrective actions to correct the situation. The failures were caused by years of neglect when PM efforts were not appropriate for the importance of the DFPs, that is, for fire protection and refilling the condenser following a station blackout.

PM activities did not include replacing parts that deteriorated with age, such as hoses and gaskets, and checking strainers. For example, when one of the DFP engine coolant hoses burst because of age and pressure, the licensee did not replace the other hoses. The hoses were also not put on a PM schedule to be replaced. Other failures included gaskets, radiator caps, packing, and seals. The engine coolant strainer was not on the PM schedule for periodic cleaning. Strainers were only cleaned in the fire main system following a problem. Other system strainers had been cleaned and checked for the first time since their installation more than 20 years ago.



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DFP1 engine failed in 1991. The licensee could not pinpoint the exact cause, but the engine had overheated several times in the six months prior to this problem. The engine was replaced but the pump is in poor condition with very little margin to meet its flow requirement. Maintenance history indicated that the reliability of DFP 1 increased after the engine replacement. The pump and engine are scheduled for replacement in 1993. A modification package was approved and the licensee is pursuing an equipment supplier.

Repair data indicated that DFP 2/3 was in poor condition. The reliability was low. The failure rate was high and occurred even though the pump was only operated 40-50 hours per year. As a result of an engine hose failure, DFP 2/3 failed the same time DFP1 failed. The licensee was able to make repairs within 24 hours otherwise the reactors were required to be shut down. The licensee purchased a third DFP that can be temporarily connected until one of the two main pumps are repaired. The problem of shutting down the plants is solved, but the reliability has not been increased much for the two main fire pumps in the event of a fire.

Both DFPs will be replaced in the 1993/1994 time frame. In addition, improved PM procedures are in the concurrence cycle for the existing pumps. Also, The PM schedule now includes checking and cleaning strainers. The technical superintendent stated during the exit that the DFPs would be put on the Technical Issues List, which assures that adequate resources will be devoted for improving the material condition of the DFPs.

#### 2.3.2 <u>Batteries</u>

Surveillance reports indicated that maintenance of the DFP batteries had been a problem including water levels, possible overcharging, and maintaining specific gravity. The licensee had taken action to turn over the maintenance of the batteries to the electrical group during 1992. Following this change the surveillance reports indicated that the condition of the batteries had improved.

## 2.3.3 Unit 1 Yard Fire Main Loop

The Unit 1 yard fire main loop appeared to be in poor condition. The 1992 fire protection insurance log indicated that the fire loop was inoperable several times in 1991 and 1992. The problems were believed to have occurred because of being disturbed during the installation of the sewage system, and not as a result of the asbestos cement piping being made brittle because of pressure cycling and aging. Maintaining reliability of the loop is important because both main fire loops are required to meet the <u>requirements of 10 CFR 50</u>, Appendix R. Current-low-reliabilitymakes it questionable whether this system will be available during a fire.

### 2.4 <u>Fire Brigade, Fire Reports, and Fire Drills</u>

Fire brigade members received extensive training, which included classroom and offsite fire fighting. The onsite fire drill requirements had been met by all brigade members who were listed as qualified. All appropriate drill and training records were properly maintained.

A review of the fire records indicated that the fire brigade was only required to respond twice in 1992. The two events were for a motor fire and a power transformer fire. The small number of responses was indicative of good control of combustibles, cutting/welding activities, and housekeeping.

Recent efforts at improvements for fire fighting include purchasing more equipment to better outfit the fire brigade members, with plans to locate the equipment at strategic locations in the plant. This will allow a faster response to fires.

## 2.5 <u>Deviation Reports and Work Requests Review</u>

The inspector reviewed open nuclear work requests (NWRs) for fire protection. The backlog was low considering the high number of NWRs that had been performed during the year. The NWRs had been properly prioritized and none of the outstanding work items appeared to be highly safety significant. The backlog had been reduced from 175 to 139 during 1992. In addition, the fire protection Nuclear Tracking System (NTS) backlog had been reduced from 65 to 32 in 1992.

There have been numerous tamper switch maintenance problems on fire protection valves. Many of the problems resulted from old tamper switches and the difficulty in purchasing replacement parts. A contributing factor was that the switches were an addon feature, which was easily knocked out of calibration. These problems were being corrected by including valves on the locked valve program with valves being maintained in position by chains and locks. Specific locks and keys will be maintained for fire protection valves. The licensee reviewed the valves to assure that those important to safety were included in this effort. Some valves had been added to or deleted from the list based on the review.

#### 2.6 <u>10 CFR 50.59 Safety Evaluations</u>

The majority of the fire protection program has been removed from the Technical Specification. This allows changes to be made to the fire protection program by performing a 10 CFR 50.59 safety evaluation. The inspector reviewed 10 CFR 50.59 safety evaluations issued for program changes for 1992. All of the changes were appropriate and were not detrimental to fire protection safety. Some surveillance cycles had been extended based on industry data and failure rates. The safety evaluations that delayed performing full flow testing of the fire main system for six months were based on preventing zebra mussels from entering the fire protection systems, and to give the licensee adequate time to make corrective actions.

The plant is currently dealing with a bio-fouling problem, zebra mussel infestation, in its intake water. Zebra mussels were found last summer on screens in the intake structure. Notable efforts were being made to prevent zebra mussels from entering the fire main systems and potentially making the fire protection systems inoperable. Full flow surveillances of the fire protection system were suspended for six months to permit modifications to the systems. Hypochlorite is being injected into the service water system, which connects to the keep fill line of the main system. In addition, thermal shock treatment is also being used to kill the mussels. A modification is planned for an injection system into the fire main system. Strainer checks indicate that the zebra mussels have not entered the fire main system. The licensee has increased the surveillance frequency for strainers. The concentration of chemicals will be monitored in the fire main system following the full flow tests to ensure that the system is maintained zebra mussel free.

### 2.7 <u>Audits of Fire Protection Activities</u>

The inspector reviewed the following audits of fire protection activities: Quality Assurance/Nuclear Safety Audit Report Number 12-91-I, January 17 through 30, 1991; Quality Assurance/Nuclear Safety Audit Report Number 12-92-I, January 27 through 31, 1992; and Offsite Quality Verification Audit Report Number 12-93-I, December 14 through 18, 1992.

Preparation for the audits was good. The audit reports were brief and did not indicate the amount of reviews that had been performed in the fire protection area. The audits had adequate detail to detect most program problems. The licensee had taken timely corrective actions for those fire protection deficiencies that were identified during the audits. The audits met regulatory requirements.



In general, the audits were more compliance based rather than being performance based. The licensee utilized a repetitive check list approach to auditing. The check lists indicated that activities listed had been reviewed in detail; however, this continued approach could contribute to missing deficiencies year after year. For example, problems with the DFP and Unit 1 yard loop reliability, which are discussed in Paragraph 2.3, were not discussed in the audits.

### 3. <u>Exit Interview</u>

The inspector met with licensee representatives (denoted in Paragraph 1) on February 22, 1993, and summarized the scope and findings of the inspection. The informational content of the inspection report was discussed with regard to documents reviewed during the inspection. The licensee did not identify any of the documents as proprietary.

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