

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-249/91032(DRS)

Docket No. 50-249

License No. DPR-25

Licensee: Commonwealth Edison Company  
Opus West III  
1400 Opus Place  
Downers Grove, IL 60515

Facility Name: Dresden Nuclear Power Station - Unit 3

Inspection At: Morris, IL 60450

Inspection Conducted: October 21 through November 12, 1991

Inspector: Peggy R. Rescheske 11/22/91  
Peggy R. Rescheske Date

Approved By: Monte P. Phillips 11/22/91  
for Monte P. Phillips, Chief Date  
Operational Programs Section

Inspection Summary

Inspection on October 21 through November 12, 1991  
(Report No. 50-249/91032(DRS))

Areas Inspected: Special safety inspection, focusing on the October 18-19, 1991, fuel handling event in which two fuel bundle bail handles were damaged in the spent fuel pool, and the fuel handling crew failed to stop fuel handling work and notify the appropriate operations management. (NRC Inspection Procedure 93702)

Results: One apparent violation was identified for failure to adequately implement the station procedure for fuel movement within the spent fuel pool, as required by Dresden Technical Specification 6.2.A. This apparent violation, along with three other apparent violations involving recent operational events (NRC Inspection Report Nos. 237/910035(DRP); 249/91038(DRP)), are being considered for escalated enforcement action.

## Report Details

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

L. Gerner, Technical Superintendent  
J. Kotowski, Production Superintendent  
G. Smith, Assistant Superintendent, Operations  
K. Peterman, Regulatory Assurance Supervisor  
R. Stachniak, Performance Improvement Supervisor  
J. Gates, Assistant Technical Staff Supervisor  
B. Zank, Operating Engineer  
M. Korchynsky, Operating Engineer  
K. Yates, Onsite Nuclear Safety Administrator  
J. Harrington, Nuclear Quality Programs Maintenance  
Group Leader  
R. Speroff, DEOP Coordinator  
T. Cole, Nuclear Engineer  
D. Lowenstein, Regulatory Assurance Analyst

#### U.S. NRC

W. Rogers, Senior Resident Inspector, Dresden  
D. Liao, Intern, Division of Reactor Projects, Region III

The above individuals attended the exit meeting held on November 12, 1991.

Other persons were contacted during the inspection including members of the licensee's operations, training, and fuel handling staffs.

### 2. Description of the Event

Dresden Unit 3 was in shutdown for refueling and all fuel had been removed from the reactor. On October 18, 1991, fuel was being moved within the spent fuel pool (SFP) to reorganize the fuel in preparation for Unit 3 core reload. The fuel handling (FH) crew consisted of a B-man (operating the refueling bridge and moving fuel) and an A-man (performing as observer and verifier). Several fuel moves had been completed during the shift by this crew. At approximately 10:15 p.m., after setting down fuel bundle X3R-106 into its new location (F2-J9), the B-man opened the grapple hook and raised the grapple. During this operation, the A-man visually verified that the fuel bundle was unlatched and then directed his attention to the next fuel move on the fuel move sheets. The B-man started to move the bridge forward and turned to look for the next move. A "bang" was heard and the B-man stopped the bridge. The

A- and B-man determined that the grapple/mast had not been raised high enough to clear the fuel bundle bail handle, and the bail handle was in contact with the grapple "housing" (the grapple hook was clear of the bail handle since the bundle was unlatched). Further, the B-man had failed to verify that the fuel bundle had disengaged from the grapple (per procedure and training, the B-man was required to attempt to rotate the mast to check for interference). When the bridge was moved the bail handle was bent, the grapple then impacted and bent the next fuel bundle (X3R-110) bail handle (this was the "bang"). The crew backed up the bridge to straighten the mast, then raised the grapple from the bail handles.

The A-man contacted the FH supervisor (by telephone) and briefly described the event. The supervisor requested the fuel bundle location and identification to log the affected bundles. The supervisor gave no explicit direction regarding continued fuel movement. Following the phone call, the FH supervisor remained in the FH office to research procedures, to find information on what to do and who to call. He found no information related to bent bail handles. On the refuel floor, the A-man exercised the mast/grapple and observed no problems. The crew moved three additional fuel bundles. During the second move the crew noted a "grinding, metal-on-metal" sound when the mast was extended. When the third bundle was moved, the grinding noise was louder. The A-man decided to stop work, and the bridge was parked with the mast/grapple over empty fuel racks. The crew left the refuel floor and went to the FH office.

The FH supervisor arrived on the refuel floor with another A-man. They observed the damaged bail handles, and inspected the mast/grapple, noting no problems. The mast was moved to the side of the SFP and fully extended. At approximately 10 feet from the SFP floor, the lower telescoping sections of the mast separated and collapsed to the end of the cable (the grapple head is supported by a cable internal to the mast; the mast is basically a housing to the cable providing lateral rigidity for the fuel). At approximately 11:00 p.m., the FH supervisor discussed the event with the FH crew involved. At approximately 11:30 p.m., the supervisor called the day-shift FH supervisor at home. The event was briefly discussed, and the day-shift supervisor suggested that the problem could be taken care of on day shift. He had assumed that the on-shift FH supervisor had informed the operations shift engineer. At this time, no one outside of the FH staff knew of the event, including the control room and licensee management. The shift ended at 2:00 a.m., on October 19, 1991.

By 6:00 a.m. on October 19, 1991, the day-shift FH supervisor had arrived onsite and read the notes left by the previous shift FH A-man and FH supervisor involved in the event. The day-shift FH supervisor called the shift control room engineer (SCRE) to discuss the "trouble" they had on night shift. At this time, all of the appropriate notifications were made, including calling the nuclear engineers. However, the health physics/ radiation protection organization was not informed until approximately 10:30 a.m. The NRC was notified via red phone at approximately 10:48 a.m. (24 hour notification under 10CFR20.403(b)(4), damage to licensed material in excess of \$2000). Later that day, the licensee conducted a fact finding meeting with the individuals involved in the event. On October 22, 1991, Region III issued a Confirmatory Action Letter (CAL) regarding resumption of fuel movement at Dresden.

3. Regulatory Requirements

The Dresden Technical Specification 6.2.A requires in part that detailed written procedures be prepared, approved, and adhered to for activities such as refueling operations. Dresden Fuel Handling Procedure DFP 0800-32, "Fuel Movement Within the Spent Fuel Pools," Revision 03, approved July 31, 1990, described the proper methods to be used when moving fuel in the spent fuel pools. Procedure step F.1.t stated, "After unlatching the grapple, raise the grapple approximately 4 inches and attempt to rotate the mast. If the mast rotates, the fuel assembly has disengaged from the grapple." Contrary to these requirements, on October 18, 1991, while moving fuel within the Dresden Unit 3 spent fuel pool, the licensee failed to perform DFP 0800-32 procedure step F.1.t, for raising the grapple and verifying that the fuel assembly was disengaged from the grapple. This is considered an apparent violation (249/91032-01(DRS)).

Three other apparent violations involving operational events have recently been identified at the Dresden Station. These items are addressed in NRC Resident Inspection Reports No. 237/91035(DRP); No. 249/91038(DRP), and involve:

Torus high temperature (August 30 - September 1, 1991)

Hydraulic control unit draindown (September 23-25, 1991)

Inadvertent single rod scram (October 6, 1991)

The apparent violation described above, along with the three other apparent violations identified in the Resident Inspection Report, are being considered for escalated enforcement action.

4. Evaluation

This evaluation is based on interviews with the FH individuals involved in the event, discussions with training and operations representatives, and review of applicable station procedures and other documents. The results of the inspection, including the assessment of root cause, were generally in agreement with the conclusions reached by the licensee's investigation.

The safety significance of the event was minor since the impact of the grapple on the fuel bundles did not result in the release of radioactive material. Water and air samples indicated no release of radioactivity.

Evaluation of the causes of the fuel handling event can be separated into three areas, as follows:

- a. The B-man had not raised the grapple high enough to clear the bail handle and had not verified that the grapple had cleared the bail (by rotating the mast), prior to moving the refuel bridge. The event was caused by the B-man inappropriately looking for the next fuel move rather than focusing his attention on handling the fuel. The only indication that the grapple had been raised above the fuel bundle was FH experience (length of time lever is held to raise grapple). Per procedure and training, verification that the grapple has cleared the bundle was to attempt to rotate the mast to check for interference. This event could have been prevented with more attention to the details of the job by both the A- and B-man.
- b. The three additional fuel bundles were moved with the damaged mast/grapple because licensee management expectation that work should be stopped in the event of personnel error or unusual occurrence had not been clearly communicated to the individuals involved in the event (A-man, B-man, supervisor). There was a lack of direction to stop work from the FH supervisor, and there was inappropriate judgement on the part of the A-man to continue work.
- c. The FH supervisor did not notify the control room or operations management of the event, because of inappropriate judgement on the part of the supervisor. The root cause was a lack of training and a lack of

written procedures regarding response to unusual incidents. Further, licensee management expectations regarding responsibility and communication had not been clear to the FH supervisor. The FH supervisor did not understand the significance of the event nor the potential safety implications. He believed that the event was not a reactivity (criticality) concern, and not a radiological problem due to no alarms. There were no written contingency plans for FH events or abnormal conditions, except for radioactivity release, high radiation, personnel injury, and loss of SFP level. The FH supervisor, who held a limited Senior Reactor Operator (SRO) license, was not familiar with reporting requirements (e.g., red phone calls), and had not received training in this area.

5. Corrective Actions

Immediate licensee action was to suspend fuel movement activities and conduct a fact finding meeting with the individuals involved in the event. After discussions with the licensee, Region III NRC issued a CAL on October 22, 1991, regarding actions the licensee agreed to complete prior to resumption of fuel movement. The licensee initiated an investigation of the event to address the details of the event, root causes, and corrective actions, thereby addressing the majority of the actions discussed in the CAL. The investigation report was in draft at the end of the inspection period.

Licensee actions completed or planned prior to resumption of fuel movement included the following:

- a. Discussions and/or training for fuel handling department personnel regarding: FH anomalies, accidents, and procedures; operations department policies on communications, control and responsibility, and procedure usage.
- b. Revisions to FH procedures were planned to address abnormal conditions, communications, and reportability.
- c. An inspection of the Unit 3 mast identified that a degraded weld failed during the event, apparently as a result of the lateral stress on the mast. Similar indications of weld deterioration were found on the Unit 2 mast and corrective maintenance was performed. The Unit 2 mast/grapple will be reassembled and installed on the Unit 3 bridge. No damage to the Unit 3 bridge was identified.
- d. The completion of the loose parts evaluation was

pending detailed inspections of the fuel handling equipment for missing parts. Initial inspections of the spent fuel racks and the upper tie plates of the affected fuel bundles did not identify additional damage or loose parts from the mast/grapple.

- e. An assessment of fuel assembly damage was conducted by the fuel vendor, who confirmed fuel integrity. The fuel bundles with the damaged bail handles were thrice-burned assemblies which were to be used for Unit 3 reload. While these bundles will not be reused in the reactor, they need to be moved from their current locations in the SFP since they appear to obstruct removal of adjacent bundles required for reload. The Unit 3 core reload design was being revised to replace the two damaged assemblies.

NRC review of the licensee's completed corrective actions and response to the CAL will be addressed in Inspection Reports No. 237/91030(DRS); No. 249/91039(DRS), which will focus on refueling operations and reactor assembly.

6. Exit Meeting

The inspector met with licensee representatives (denoted in Paragraph 1) on November 12, 1991. The inspector summarized the purpose, scope, and findings of the inspection and the likely informational content of the inspection report. The licensee acknowledged this information and did not identify any information as proprietary.