



UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION III
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SEP 3 1974

Commonwealth Edison Company
ATTN: Mr. Byron Lee, Jr.
Vice President
Post Office Box 767
Chicago, Illinois 60690

Docket No. 50-237
Docket No. 50-249

Gentlemen:

This refers to the inspection conducted June 27-28, July 1-3 and August 2, 1974, by Messrs. Fisher and Schumacher of this office of activities authorized by AEC Operating Licenses No. DPR-19 and No. DPR-25 and to the discussion of our findings with Messrs. Stephenson, Roberts, Diederich and Adam of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspectors.

During this inspection certain of your activities were found to be in apparent violation of AEC requirements, as described under Enforcement Action in the Summary of Findings Section of the enclosed inspection report.

No enforcement action is being taken with respect to the identified violations at this time. These violations are being reviewed in conjunction with the findings from our recent special inspection involving the unplanned radioactive liquid release from Unit 1. We will inform you of our enforcement action following our final evaluation of these matters.

Based on discussions with your representatives at the site, we understand that action will be taken to accomplish the following items:

1. Revise Dresden procedure "Curie Content Calculation for Unit 2/3 Radioactive Waste Storage Tanks" to reflect method in use.
2. Resolve uncertainties with regard to reactor vent particulate monitoring.

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3. Improve surveillance of chimney monitor flow rate.

We will examine your actions on these matters during subsequent inspections.

In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

We will gladly discuss any questions you have concerning this inspection.

Sincerely yours,

James G. Keppler
Regional Director

Enclosure:

RO Inspection Rpt Nos. 050-237/74-07
and No. 050-249/74-09

bcc: RO Chief, FS&EB
RO:HQ (4)
Licensing (4)
DR Central Files
RO Files
PDR
Local PDR
NSIC
DTIE
Anthony Roisman, Esq.

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Operational Radwaste Program Inspection

RO Inspection Report No. 050-237/74-07

RO Inspection Report No. 050-249/74-09

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dresden Nuclear Power Station
Units 2 and 3
Morris, Illinois

License No. DPR-19
License No. DPR-25
Category: C

Type of Licensee: GE BWR, 810 MWe

Type of Inspection: Routine, Announced

Dates of Inspection: June 27, 28, July 1-3 and August 2, 1974

Dates of Previous Inspection: June 10-14, 25 and 26, 1974 (Operations)

Principal Inspector: *M. Schumacher*
M. C. Schumacher

8/23/74
(Date)

Accompanying Inspector: *W. L. Fisher*
W. L. Fisher

Other Accompanying Personnel: None

Reviewed By: *W. L. Fisher*
W. L. Fisher
Senior Health Physicist
Facilities Radiological
Protection Section

8/23/74
(Date)

SUMMARY OF FINDINGS

Enforcement Action

- A. Technical Specification 4.8.D. requires that waste sample tanks, floor drain sample tanks, and the waste surge tank be sampled for analysis every 72 hours, unless no liquid has been added to the tank.

Contrary to the above, tanks were not sampled within 72 hours after liquid addition on six occasions during the first half of 1974. (Paragraph 2.f.)

- B. Technical Specification 3.8.D. requires that radioactivity in waste sample tanks, floor drain sample tanks, and the waste surge tank not exceed 0.7 curies for more than 24 hours.

Contrary to the above, on three occasions in May 1974, tanks contained more than 0.7 curies for longer than 24 hours. (Paragraph 2.g.)

- C. Technical Specification 4.6.C.1.b. requires isotopic analysis of a sample of reactor coolant at least once per month.

Contrary to the above, isotopic analyses have generally not been performed since February 1974. (Paragraph 3)

- D. The Technical Specifications (Section 4.2) requires that off-gas isolation monitors be calibrated every three months.

Contrary to the above, the licensee's records indicate that the Unit 2 off-gas monitor was calibrated last on January 24, 1974. (Paragraph 5.d.)

- E. The Technical Specifications (Section 4.8) requires that isotopic analysis of condenser off-gas be performed at least quarterly.

Contrary to the above, the licensee's records indicate a failure to perform this analysis for Unit 3 off-gas during the first quarter of 1973. (Paragraph 5.e.)

Licensee Action on Previously Identified Enforcement Matters

None within the scope of this inspection.

Unusual Occurrences

None within the scope of this inspection.

Other Significant Findings

A. Current Findings

Significant problems are being experienced in the management of liquid radwaste. (Paragraph 2.b.)

B. Unresolved Items

Particulate releases reported for the Unit 2 Reactor Building Vent may be low by a factor of two. Sampling in Unit 2 and/or Unit 3 reactor building vents may not be isokinetic. (Paragraph 5.b.)

C. Status of Previously Reported Unresolved Items

Calibration of the service water and closed cooling water process monitors has not been completed. (Paragraph 2.c.)

Management Interview

A management interview was conducted at the conclusion of the inspection with Messrs. Stephenson, Roberts, Diederich, and Adam. The following matters were discussed:

- A. The inspector noted that "solidified" waste having an axial hole had dewatered significantly during an experiment. The licensee agreed to consider the implications of this experiment in connection with burial of such waste in polyethylene liners. (Paragraph 4)
- B. The inspector noted an apparent liquid radwaste volume discrepancy between plant records and the licensee's 1973 semiannual effluent reports, and suggested that the discrepancy be corrected in a future semiannual report. (Paragraph 2.a.)
- C. The inspector stated that the liquid release reported in the licensee's letter dated June 27, 1974, had been reviewed, that no regulatory limits appear to have been exceeded, and that there were no further questions concerning the release. (Paragraph 2.h.)
- D. The inspector noted that, in apparent violation of Technical Specification 4.8.D, above ground liquid radwaste tanks had not been sampled within 72 hours after liquid addition on six occasions so far during 1974. (Paragraph 2.f.)
- E. The inspector noted that the sampling of above ground liquid radwaste tanks frequently was not entered in the "Radioactive Waste Storage Surveillance" log. The licensee agreed to ensure that tanks are properly sampled for analysis and that sampling and analytical data are properly recorded. (Paragraph 2.f.)

- F. The inspector noted that during 1973, floor drain sample tanks accounted for 31% of the volume and 84% of the activity. The licensee responded that current efforts to upgrade the radwaste system and to reduce radwaste sources are expected to result in significant effluent reduction. (Paragraph 2.b.)
- G. The inspector noted that the procedure "Curie Content Calculation for Unit 2/3 Radioactive Waste Storage Tanks" is being followed only when radioactivity in above ground tanks approaches the technical specification limit. The licensee agreed to revise the procedure to describe the method actually in use. (Paragraph 2.f.)
- H. The inspector stated that the instances of exceeding 0.7 curie in above ground tanks for longer than 24 hours, as reported in the licensee's letters dated May 31 and June 6, 1974, had been reviewed and that there were no further questions at this time. (Paragraph 2.g.)
- I. The inspector stated that several reported instances of exceeding 0.7 curie in above ground tanks for less than 24 hours had been reviewed and that there were no further questions at this time. (Paragraph 2.g.)
- J. The inspector noted that, in apparent violation of Technical Specification 4.6.C, a Unit 2 reactor coolant sample was not analyzed in April 1974 and that monthly isotopic analyses have not been completed since February 1974. (Paragraph 3)
- K. The inspector observed that Unit 2/3 airborne releases for the period January 1973 through June 1974 appeared to be within the technical specifications. He also noted that release data in the licensee's semiannual reports were in agreement with daily release data with only minor discrepancies noted. (Paragraph 5.a.)
- L. The inspector stated that his review of reactor vent stack monitoring records revealed several anomalies including the possibility that particulate releases from unit two are being underestimated by a factor of two. He also questioned whether isokinetic sampling was being done. The licensee acknowledged these problems and promised to review and document his procedures in this area. (Paragraph 5.b.)
- M. The inspector stated that there was need for more vigilant review of chimney monitor data noting that a low flow condition apparently went unobserved and uncorrected for eleven days. He also noted that there appeared to have been an inordinately long delay in making a needed modification to this monitor. The licensee stated that surveillance would be improved and acknowledged past difficulties in making a modification to the monitor. (Paragraph 5.c.)

- N. The inspector stated that instrument maintenance shop records indicate that the Unit 2 off-gas monitor was last calibrated in January 1974, and is therefore in conflict with the technical specification requirement that a calibration be done every 3 months. The inspector also noted that these records were generally in need of improvement. By subsequent telephone conversation (July 5, 1974), a licensee's representative stated that it was believed that the subject calibration had actually been performed but had not been recorded. (Paragraph 5.d.)
- O. The inspector stated that the failure to perform isotopic analyses of Unit 3 off-gas in the first quarter of 1973 was a violation of the Technical Specifications. (Paragraph 5.e.)
- P. The inspector noted that the licensee's actions following the failure of the Unit 2/3 chimney monitor on April 25, 1974, were adequate. (Paragraph 5.f.)

REPORT DETAILS

1. Persons Contacted

D. Adam, Engineer
R. Allen, Engineer Assistant
R. Crandall, Engineer
R. Pavlick, Rad. Chem. Supervisor
R. Ragan, Engineer
R. Meadows, QA Engineer
R. Thomas, Instrument Maintenance Foreman
S. Gurney (ANEFco)
B. Irving (ANEFco)

2. Liquid Radwaste

a. Records

Liquid radwaste records for calendar year 1973 were reviewed and compared against data reported in the licensee's semiannual reports for that year. No discrepancies were observed in the radioactivity (26 curies) reported as having been released during 1973. However, the reported release volume (6.8×10^6 gallons) appears to have been high by nearly a factor of two.

During 1973, the following quantities of liquid radwaste were released:

	Activity		Volume	
	Predicted * Ci	Actual Ci	Predicted * Gallons	Actual Gallons
Waste Sample Tanks	0	3.9	0	2.6×10^6
Floor Drain Sample Tanks	15	22	1.5×10^7	1.2×10^6
Decontamination Solution Tank	0	0.18	0	1.2×10^4
Total	15	26	1.5×10^7	3.8×10^6

*Predicted values obtained from "normal activity" (reactor water activity concentration of $0.1 \mu\text{Ci/cc}$) and "normal daily" (steady state operation) values from GEK-9560, Operation and Maintenance Instructions (Dresden 2/3 Radioactive Waste System).

Radwaste batch records for the periods October, November, and December 1973, and March, April, and May, 1974, were reviewed and found to be adequate. Sampling, analysis, and release records concerning Batch Number 2684, an "A" Floor Drain Sample Tank released on June 20, 1974, were reviewed and found to be adequate.

Although no calculational or analytical errors were observed, certain assumptions by the licensee appear to be causing an overestimate of radwaste concentrations and, therefore, liquid effluent releases. Duplicate 2-milliliter radwaste samples are counted for gross gamma activity in a NaI well scintillation system. Activity measured in this manner is conservatively assumed to be all radioiodine, apparently in response to a question previously raised concerning the need for measuring radioiodine in Unit 1 liquid effluent.^{1/} Duplicate 5-milliliter samples are evaporated and counted in a 2-pi gas flow proportional system. The overall beta counting efficiency is conservatively assumed to be 25 percent. The total concentration in the sampled radwaste is then assumed to be the sum of the above gamma and beta concentrations. This method probably results in concentration estimates high by a factor of 2 to 4.

b. Waste Treatment

Decontamination solutions are processed only by filtration before release. Clean waste is filtered and demineralized before being returned to condensate storage or released. Floor drain waste is normally filtered and released without further treatment, although processing through either the waste demineralizer or the waste concentrator is possible. The licensee has had considerable difficulty with the radwaste system and, due to equipment malfunctions, has at times found it impossible to process liquid radwaste as fast as it was being generated. Tanks have overflowed into radwaste sumps; turbine building and reactor building sumps have overflowed; and resins and sludge have overflowed onto the radwaste basement floor. Efforts currently under way to upgrade the radwaste system and to reduce the sources of radwaste are expected to alleviate this problem.

During 1973, floor drain sample tanks were the source of 31 percent of the volume and 84 percent of the activity released to the river. Correction of radwaste source and equipment problems should considerably reduce these releases.

^{1/} RO Inspection Report 05000010/72-03.

c. Process Liquid Monitors

During an inspection performed in May 1972, the licensee agreed to calibrate Unit 2/3 service water and closed cooling water monitors to confirm a sensitivity of 3×10^{-6} microcuries per milliliter as described in the Safety Analysis Report.^{2/} During a recent Unit 1 inspection, this work was found not to have been completed, although a study under way is scheduled for completion by October 1, 1974.^{3/}

d. Unmonitored Release Paths

There appear to be no unmonitored release paths for liquid radwaste to reach the river. One source of effluent to the storm sewer, the leakage of slightly contaminated water from heating boiler valve packing, was found to be insignificant.

e. Semiannual Reports

Regarding weekly composite samples taken from the Unit 1 inlet canal and the Unit 2/3 discharge canal, the licensee's semiannual reports for calendar year 1973 state, "Analytical results . . . do not indicate any measurable radioactivity attributable to plant operation."^{4/ 5/} The measured concentrations for inlet and discharge canals support this conclusion.

f. Radioactive Waste Storage (Sampling)

Technical Specification 4.8.D. requires that the waste sample tanks, floor drain sample tanks, and waste surge tank be sampled for analysis every 72 hours, unless no liquid has been added to the tank. A review of the "Radwaste Sample Log" and "Radioactive Waste Storage Surveillance" records for the period January through June 1974 revealed six occasions of untimely sampling.

Volume Change

<u>Tank</u>	<u>From</u>	<u>To</u>	<u>On</u>	<u>Sampled On</u>
Surge	33%	50%	1/19/74	1/23/74
Surge	20%	57%	2/15/74	2/19/74
Surge	16%	23%	3/19/74	3/28/74
Surge	0%	41%	5/3/74	5/22/74
'A' FDST	0%	15%	5/28/74	6/4/74
Surge	0%	22%	6/22/74	6/28/74

^{2/} Letter, RO:III to CECO, dated 6/19/72.

^{3/} Letter, RO:III to CECO, dated 7/15/74.

^{4/} "Dresden Nuclear Power Station Radioactive Waste and Environmental Monitoring - January through June 1973."

^{5/} "Dresden Nuclear Power Station Radioactive Waste and Environmental Monitoring - July through December 1973."

Frequently, the fact that tanks had been sampled was not noted in the "Waste Storage Surveillance" (Center Desk) log. Failure to maintain this information may have resulted in overlooking required tank sampling.

The procedure "Curie Content Calculation for Unit 2/3 Radioactive Waste Storage Tanks," revised in August 1973, provides a means for determining the radioactivity content of above ground tanks. In practice, however, the determination is not made for all tanks, but only for those whose measured concentration exceeds a predetermined, undocumented, value. Although this method seems to adequately ensure that the 0.7 curie per tank and 3 curies in all above ground tanks limits will not be exceeded, it is not described in the procedure.

g. Radioactive Waste Storage (Radioactivity Limit)

On May 23, 1974, radioactivity in the waste surge tank exceeded 0.7 curies^{6/}. As reported by the licensee, the activity was not reduced to less than 0.7 curies within 24 hours as required by Technical Specification 3.8.D. Appropriate corrective action appears to have been taken by the licensee.

On May 27, 1974, radioactivity in the 'A' waste sample tank exceeded 0.7 curies.^{7/} (The licensee's letter erroneously reported the date as May 28.) As reported by the licensee, the activity was not reduced to less than 0.7 curies within 24 hours as required by Technical Specification 3.8.D. After about 25 hours had elapsed, sufficient water was transferred to the surge tank to reduce the 'A' waste sample tank content to less than 0.7 curies. However, this action caused a second violation by increasing the surge tank radioactivity to more than 0.7 curies. This condition also was not corrected within 24 hours. Appropriate corrective action appears to have been taken by the licensee.

Other reported instances of exceeding 0.7 curies in above ground tanks were reviewed.^{8/} Since in each case the problem was corrected within 24 hours, none of these occurrences were reportable for having exceeded a limiting condition for operation. Appropriate corrective action appears to have been taken by the licensee in each case.

6/ Ltr, CECO to L, dtd 5/31/74.

7/ Ltr, CECO to L, dtd 6/6/74.

8/ Ltrs, CECO to L, dtd 3/29/73, 3/30/73, 4/13/73, 7/17/73, 7/20/73, and 8/10/73.

h. 'A' Floor drain Sample Tank Release - June 20, 1974

The licensee recently reported the release of an 'A' floor drain sample tank at a rate which resulted in an apparent discharge canal concentration greater than the 1×10^{-7} microcurie per milliliter limit.^{9/} A review of this release confirmed that, due to conservative dilution assumptions, the concentration had not actually exceeded the limit.

3. Reactor Coolant

A review of reactor coolant analysis records show that during 1974 the concentration of total iodine has not exceeded 0.1 and 1 microcurie per milliliter in Unit 2 and 3 coolants, respectively.

Technical Specification 4.6.C.1b. requires isotopic analysis of a sample of reactor coolant at least once per month. Contrary to this requirement, no isotopic analysis of Unit 2 coolant was performed during April 1974. Quantitative gamma analyses have not been completed since January and February 1974 for Units 2 and 3, respectively. Unit 2 and 3 coolant samples dating back to February 1974 were sent to a commercial laboratory on June 29 for tritium and strontium analyses. This lack of and untimely analysis appears to be in violation of the technical specifications.

Conductivity, pH, turbidity, and chlorine are measured in daily reactor water samples. A review of Unit 2 and 3 records showed that conductivities have not exceeded 2 micromhos per centimeter during 1974. Chloride concentration exceeded 0.1 parts per million on only one occasion, when the limit was 0.5 parts per million. As required by Technical Specifications, coolant samples appear to have been taken every four hours during startups and at steaming rates below 100,000 pounds per hour.

4. Solidification of Resin and Sludge

As previously reported, resin and sludge are being solidified by ANEFCO.^{10/} During the current inspection, an axial hole was created in a liner by pouring the 65% waste-35% urea formaldehyde mixture around a removable form, which extended to the bottom of the liner. After the waste had solidified, the form was removed, leaving a

^{9/} Ltr, CECO to L, dtd 6/27/74.

^{10/} RO Inspection Rpt No. 050-010/74-05.

rectangular hole about one square foot in crosssectional area. When viewed by the inspector the day after the pour, the central hole contained liquid to an estimated depth of two feet. The sides of the hole appeared to darken slightly from top downward, probably due to increasing dampness. The liquid in the hole is presumed to have seeped out of the "solidified" waste - urea formaldehyde mixture, which entraps but does not chemically bind liquids. ANEFCO personnel stated that liquids will remain in the waste - urea formaldehyde matrix as long as the liner is not breached.

5. Gaseous Radwaste

a. Release Records

Daily records of airborne radioactivity release were examined and found to be complete with data reduction properly done. No releases in excess of licensee limits were observed. The maximum noble gas release rate (121,000 $\mu\text{Ci/sec}$) occurred on February 27, 1973. The maximum iodine plus particulate release from the 2/3 chimney (3.3 $\mu\text{Ci/sec}$) occurred on November 19, 1973, while the maximum combined release from the reactor vent stack (0.097 $\mu\text{Ci/sec}$) occurred on June 15, 1974. Comparison of the licensee's semiannual reports with the daily release data revealed only insignificant discrepancies in those reports.

b. Reactor Vent Monitoring

Particulate and iodine releases from each reactor vent are based on filter and charcoal cartridge samples collected by a constant air monitor (CAM). In each vent there is also a similar but independent system (unreported) used to take backup samples. An analysis of 3 months of 1974 records for Unit 2 indicates that particulate releases based on the latter samples would be about a factor of two higher than those reported.

The significance of this observation is uncertain because of a general lack of documentation at hand about these systems. However, it is believed that the unreported system includes an isokinetic probe while the reported system does not; moreover, the unreported system is known to use a type HA millipore filter but the licensee was unable to characterize the particulate filter used in the reported system. The inspector expressed doubt that sampling in these vents is being done isokinetically noting that Unit 3 sample flow rates were more variable and were about 40% less than for Unit 2 although vent flows were

assumed equal. The inspector also observed that Unit 3 monitor exhaust hose was made of unreinforced plastic and carried a permanent crimp. In summary, there are several items of uncertainty or questionable practice attendant to reactor vent monitoring that need resolution by the licensee.

c. Unit 2/3 Chimney Monitor Flow

The Unit 2/3 chimney monitor is designed to maintain approximately constant air flow. Review of the 1974 data shows that the system performs reasonably well. Average flow rate change over a 24 hour sample period was about 20% and in 90% of the samples, the average flow was within 20% of isokinetic (2.5 cfm). However, the data also shows several flow anomalies which were apparently unobserved and uncorrected, including a low flow condition that last 11 days between March 6 and March 16, 1974.

A review of documentation on this monitor revealed that it was modified in March 1973 after two years of correspondence concerning its inadequacies with regard to flow control.

d. Process Instrumentation Calibration

A review of instrument maintenance shop records of calibration and functional tests indicated that required calibrations and functional tests were performed except that the Unit 2 off-gas monitor had not been calibrated since January 1974. The technical specifications require that this monitor be calibrated every three months.

The inspector found that the records themselves were in need of improvement. Calibrations and functional tests were not always clearly distinguished. Data sheets were sometimes undated and not easily connected with a particular test or calibration. Changes in test procedures were poorly documented and were made difficult to follow by the use of data sheets appropriate to obsolete procedures.

e. Unit 3 Off-Gas Isotopic Analysis

Isotopic analysis of Unit 3 off-gas was not done during the first quarter of 1973. During part of this period, the licensee's sodium iodide spectrometer was inoperable while calibration of his GeLi system had not been completed. The licensee's records indicate that a sample was taken and counted on March 3 but the analysis was not completed until October.

f. Chimney Monitor Failure on April 25, 1974^{11/}

The Unit 2/3 chimney monitor was inoperative for approximately 2.5 hours on the morning of April 25, 1974, because of the failure of two sample pumps within 2 hours. At the time, Unit 3 was down for refueling. Unit 2 was held at steady power and surveillance of the off-gas ionization chambers was increased until the chimney monitor was restored. The licensee's records indicate that the off-gas release was steady during the outage.

^{11/} Ltr, CE to L, dtd May 3, 1974.