

OFFICIAL USE ONLY

JAN 2 1973

50-237 ✓  
50-249

To Files

INSPECTION REPORTS 050-237/72-06 AND 050-249/72-06, COMMONWEALTH EDISON COMPANY, DRESDEN 2 AND DRESDEN 3 REACTORS, MORRIS, ILLINOIS

Subject inspection reports, covering an inspection of the safe-guards control of the special nuclear material at the Dresden 2 and Dresden 3 nuclear reactors were reviewed by the M&PPOB staff. No items of noncompliance with the material protection requirements of Title 10, CFR, Part 70, DPR-19 and DPR-25 were noted as a result of the inspection.

It is recommended that the attached letter be sent to the licensee.

Original signed by  
H. V. Werner

Harold Werner, Staff Assistant  
for Engineering  
Materials and Plant Protection  
Operations Branch  
Directorate of Regulatory Operations

bcc: M&PPOB Reading, w/o rpt  
M&PPOB File, w/rpt  
RHEngelken, w/o rpt  
Docket Nos. 50-237 & 50-249, w/rpts  
RO:III, w/o rpt

OFFICIAL USE ONLY

1085.1 ew

OFFICE ▶	M&PPOB					
SURNAME ▶	HVWerner:leg					
DATE ▶	1/2/73					

**OFFICIAL USE ONLY**

bcc: M&PPOB Reading, w/o rpt  
M&PPOB File, w/rpt  
RHEngelken, w/o rpt  
Docket Nos. 50-237 & 50-249, w/rpts  
RO:III, w/o rpt  
PDR, w/o rpt

JAN 8 1973

50-237  
50-249

Commonwealth Edison Company  
Attn: Mr. Byron Lee, Jr.  
Assistant to the President  
P. O. Box 767  
Chicago, Illinois 60690

Gentlemen:

This refers to the inspections conducted by Messrs. C. C. Peck, A. G. Finley, and J. P. Patterson from the Region III Office, Directorate of Regulatory Operations during the period November 2-3 and 16, 1972. The inspection covered the safeguards control provided by Commonwealth Edison over the special nuclear material possessed at the Dresden 2 and Dresden 3 Reactor facilities pursuant to AEC Licenses DPR-19 and DPR-25. This also refers to the discussion of our findings held by Mr. Peck with Mr. W. P. Worden, J. G. Diederich and J. Bowers, on December 18, 1972.

As a result of the inspection, no items of noncompliance with the conditions of the safeguards requirements of Title 10, Code of Federal Regulations, Part 70, "Special Nuclear Material" were noted.

Sincerely,

F. E. Kruesi, Director  
of Regulatory Operations

cc: Mr. E. T. Wein  
Assistant to Comptroller  
Commonwealth Edison Company  
P. O. Box 767  
Chicago, Illinois 60690

**OFFICIAL USE ONLY**

1085.2

*Handled  
1/15/73*

OFFICE ▶	RO:M&PPOB	RO:M&PPOB	RO <i>W</i>	RO <i>JK</i>		
SURNAME ▶	HVWerner:leg	VJD Amico	RHEngelken	FEKruesi		
DATE ▶	1/5/73	1/15/73	1/5/73	1/8/73		

OFFICIAL USE ONLY

NUCLEAR MATERIALS SAFEGUARDS INSPECTION

OF SPECIAL NUCLEAR MATERIAL AT

DRESDEN 3 REACTOR FACILITY OF

COMMONWEALTH EDISON COMPANY

MORRIS, ILLINOIS

RO INSPECTION REPORT NO. 050-249/72-06

I. INTRODUCTION

An inspection of the licensee's control over special nuclear material at the Dresden 3 reactor facility was made by Region III, Materials and Plant Protection Branch. The inspection covered the period of operation from November 19, 1970, to October 31, 1972. The field work was done on November 2, 3, and 16, 1972.

The Dresden 3 reactor is owned and operated by Commonwealth Edison Company of Chicago, Illinois. There are two other reactors at the same site, Dresden 1 and Dresden 2. The facility is located about 55 miles southwest of Chicago, Illinois, at the confluence of the Des Plaines and Kankakee Rivers.

Dresden 3 is a General Electric, single cycle, boiling water reactor designed to operate at 2255 Mw(t) and 715 Mw(e). The core consists of 724 assemblies of 49 fuel rods each. Each fuel rod contains UO<sub>2</sub> pellets clad in zircaloy. The rods in each assembly are of three separate enrichments; 1.24%, 1.69%, and 2.45%. The Dresden 3 reactor has its own storage pool for irradiated fuel and shares a storage area for unirradiated fuel with the Dresden 2 reactor. The initial core loading and reactor startup occurred in March 1971. Irradiation of the first core is still in progress.

II. SCOPE

The inspection was to determine compliance of the Dresden 3 reactor with those parts of 10 CFR Part 70, Special Nuclear Materials, that apply to power reactors. Inspection for compliance with authorized possession limits for special nuclear material under license DPR-25 was also made. The licensee's safeguards controls were inspected for adequacy of inventory procedures, internal control, records

OFFICIAL USE ONLY

1085.3

OFFICIAL USE ONLY

and reports, and determination of nuclear material depletion and production. Provisions of 10 CFR Part 73, Physical Protection of Special Nuclear Material, did not apply since Dresden 3 has no unirradiated plutonium or uranium enriched greater than 20% in uranium-235.

III. CONCLUSIONS

No items of noncompliance with 10 CFR 70 or DPR-25 were found.

The inspection disclosed Commonwealth Edison compliance with requirements of 10 CFR 70 as follows:

- A. CEC was not required to submit to AEC written material control and accounting procedures under the exclusion of 10 CFR 70.51(c).
- B. Possession and use of special nuclear material at Dresden 3 has been confined to the locations and purposes authorized in the license, as required by 10 CFR 70.41.
- C. SNM has not been transferred except to an authorized recipient as required by 10 CFR 70.42.
- D. Records showing receipt, inventory, and location of all special nuclear material at Dresden 3 have been maintained as required by 10 CFR 70.51(a).
- E. Written material control and accounting procedures have been established and maintained in accordance with 10 CFR 70.51(b)(1). The procedures contain no description of methods used to determine thermal output or SNM depletion and production.
- F. Physical inventories have been conducted as required by 10 CFR 70.51(b)(2).
- G. There were no losses that required reporting under 10 CFR 70.52.
- H. Material Status Reports have been submitted for each period ending June 30 and December 31 as required by 10 CFR 70.53. Errors in SNM depletion and production is the AEC-742 for the period January - June 1972 will be corrected in the AEC-742 for July - December 1972.
- I. Forms AEC-741 have been properly executed as required by 10 CFR 70.54.

The Dresden 3 reactor is authorized to possess 5000 kgs of uranium-235 under DPR-25. The facility possessed no unirradiated SNM at the time of the inspection.

#### IV. DETAILS OF INSPECTION

##### A. Inventory and Inventory Verification

No spent fuel has been removed from the Dresden 3 reactor. The spent fuel basin was dry and empty of fuel.

The licensee's core diagram was accepted as evidence of the fuel in the reactor. Some of the 724 assemblies indicated on the diagram were checked against the status board maintained for Dresden 3. There were no discrepancies. Inspection of some internal transfer records which were completed at the time the fuel was loaded disclosed no discrepancies.

There were ten unirradiated fuel assemblies containing a total of 449 rods outside the reactor building. The assemblies are crated for return to the supplier, General Electric. Physical presence of this fuel was confirmed visually; internal records confirmed the quantity of material.

##### B. Internal Control

Procedures for the control of special nuclear materials were found to be acceptable. The licensee has a single manual entitled "Nuclear Procedures" which describes shipping, receiving, inventory, and control procedures for all three reactors. An effort has been made to standardize forms and procedures used for the three facilities.

"Nuclear Procedures" contains no description of the methods used to determine reactor thermal power or SNM production and depletion. There are differences between the method for Dresden 2 and 3 (described in sections D and E) and the method for Dresden 1. The licensee was requested to add to the manual descriptions of the methods used.

##### C. Records and Reports

AEC-741 and -742 forms are prepared by General Books at the Commonwealth Edison downtown Chicago office. Forms issued during the inspection period were audited at General Books on November 16, 1972. There were no discrepancies.

Beginning July 1, 1971, separate RIS numbers were assigned to Dresden 2 and Dresden 3. Previously all three facilities at the site were identified as ZED. The new symbols for Dresden 2 and 3 are YVE and YVF respectively. AEC-742 forms were correctly issued to indicate reallocation of SNM from ZED to YVF.

Dresden 3 material balance statements for June 1972 are enclosed as Appendices A and B.

D. Reactor Thermal Output

A process computer has the capability of calculating thermal power output for each hour of the day. For most earlier reactors, like Dresden 1, thermal power was hand calculated. Hand calculation although possible for Dresden 3 is not practiced.

E. SNM Production and Depletion

The thermal power output for the period January - June 1972 was determined from Dresden 3 internal records. This quantity (297,777 MWD) was used to calculate quantities of uranium and plutonium produced for comparison with the corresponding quantities reported on the AEC-742.

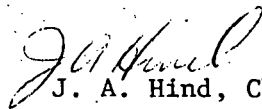
The agreement between AEC-742 quantities and the calculated amounts was not good. Further investigation at the General Books office in Chicago disclosed that, although depletion and production quantities are developed by the Process Computer, these are not considered accurate at the present time. In preference to using the onsite computer figures, General Electric develops depletion and production quantities using a GE computer at Valcitos and thermal power data from the Dresden 3 computer. For the January - June period, however, GE calculations could not be obtained in sufficient time to be used on the AEC-742 report; the licensee, therefore, resorted to manual calculations to determine the quantities reported on the AEC-742. The licensee acknowledged the probable inaccuracy of the AEC-742 figures and produced the late-arriving General Electric data for comparison. The later data were in better agreement with AEC-calculated quantities. The licensee agreed to correct for inaccurate depletion and production quantities of the January - June report in the AEC-742 to be issued for July - December.

A comparison of licensee and AEC-calculated data is presented below. The percentage differences between licensee and AEC

OFFICIAL USE ONLY

Quantities are shown in parentheses. The data calculated by GE (column 2) can be seen to be in better general agreement with AEC than the data reported on AEC-742 forms (column 1).

	(1) AEC-742 <u>(grams)</u>	(2) Corrected <u>(grams)</u>	(3) AEC Calculated <u>(grams)</u>
Uranium-235	340770(-1)	318850(-6)	341211
Uranium	604270(22)	520200(5)	495560
Plutonium	181028(0.6)	170746(-5)	179917



J. A. Hind, Chief  
Materials and Plant Protection Branch

Attachments:  
Appendices A and B

Date: November 29, 1972

OFFICIAL USE ONLY

COMMONWEALTH EDISON COMPANY  
DRESDEN 3 NUCLEAR POWER PLANT  
PRIVATELY OWNED ENRICHED URANIUM  
MATERIAL BALANCE STATEMENT

AS OF JUNE 30, 1972

Units: Grams

	<u>Total U</u>	<u>U-235</u>
Beginning Inventory 7/1/71 <sup>1/</sup>	-0-	-0-
Receipts	141,974,788	3,019,590
Shipments	-0-	-0-
Burnup	814,590	495,863
Ending Inventory	141,160,198	2,523,727

<sup>1/</sup> Inventory established 7/1/71 at the time RIS YVF assigned Dresden 3.

APPENDIX A

OFFICIAL USE ONLY

1085.8



OFFICIAL USE ONLY

COMMONWEALTH EDISON COMPANY  
DRESDEN 3 NUCLEAR POWER PLANT  
PRIVATELY OWNED PLUTONIUM  
MATERIAL BALANCE STATEMENT  
AS OF JUNE 30, 1972

Units: Grams

	<u>Total Pu</u>	<u>Pu-239 + 241</u>
Beginning Inventory 7/1/71 <sup>1/</sup>	-0-	-0-
Receipts	-0-	-0-
Production	275,700	270,900
Shipments	-0-	-0-
Ending Inventory	275,700	270,900

<sup>1/</sup> Inventory established 7/1/71 at the time RIS, YVF assigned Dresden 3.

APPENDIX B

OFFICIAL USE ONLY

1085.9