Reactor Facilities Branch

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

MAY 27 1976

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

Docket No. 50-237
Docket No. 50-249
Docket No. 50-254
Docket No. 50-265

Gentlemen:

This refers to the inspection conducted on April 29 and May 13, 1976, by Mr. C. C. Peck of this office and to the discussion of his findings with Messrs. Larson, Butterfield, Massiu, Kuhel and other members of your staff at the conclusion of the inspection. Your activities pursuant to Title 10, Code of Federal Regulations, Part 70, "Special Nuclear Material as they pertain to Licenses No. DPR-19, No. DPR-25, No. DPR-29 and No. DPR-30 were the subject of the inspection.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

The inspection consisted of an examination of the plutonium production and uranium fission and transmutation quantities that Commonwealth Edison has reported semi-annually on forms NRC-742, Material Status Report for the Dresden 2 and 3 and Quad-Cities 1 and 2 stations. During a previous inspection (No. 050-237/75-24 and 050-249/75-21), quantities reported were found to differ significantly from the amounts that our inspectors considered to be reasonable based on thermal energy generated and fuel exposure for some of the six-months period. The reasons for such differences were satisfactorily explained to us during this inspection and we have no further questions at this time. To eliminate the possibility of future discrepancies, it was agreed at the conclusion of the inspection that future Material Status Reports for Commonwealth Edison facilities would show actual in-core plutonium production and uranium fission and transmutation totals on the reverse side of the NRC-742 form, whenever such totals differ from quantities recorded on the front of the form.

Areas examined during this inspection concern a subject matter which is exempt from disclosure according to Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Consequently, our report of this inspection will not be placed in the Public Document Room.

We will be glad to discuss any questions you have concerning this inspection.

Sincerely yours,

J. A. Hind, Chief
Safeguards Branch

Enclosure:
IE Inspection Reports
No. 050-237/76-10,
No. 050-249/76-09,
No. 050-254/76-14,
and No. 050-265/76-12
(Part 2.790(d) Information)

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UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

IE Inspection Report No. 050-237/76-10
IE Inspection Report No. 050-249/76-09
IE Inspection Report No. 050-254/76-14
IE Inspection Report No. 050-265/76-12

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Dresden Nuclear Power Station — License No. DPR-19
Units 2 and 3 — License No. DPR-25
Morris, Illinois — Category: C

Quad-Cities Nuclear Power Station — License No. DPR-29
Units 1 and 2 — License No. DPR-30
Cordova, Illinois — Category: C

Type of Licensee: BWR, 800 MWe

Type of Inspection: Materials Safeguards, Announced

Dates of Inspection: April 29 and May 13, 1976

Principal Inspector: P. J. Holody Jr. for C. C. Peck — 5/26/76 (Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: J. A. Hind, Chief, Safeguards Branch — 5/26/76 (Date)

Attachment:
Findings (Part 2.790(d) Information)

S-F3-76-285
Copy 6 of 13 copies
9 Pages

SUMMARY OF FINDINGS

Inspection Summary

Inspection conducted April 29 and May 13, 1976 (Dresden Units 2, 76-10 and 3, 76-09) (Quad-Cities Units 1, 76-14 and 2, 76-12): The inspection consisted of an examination of uranium depletion and plutonium production quantities that have been reported on Forms NRC-742 by the licensee for the Dresden 2 and 3 and Quad-Cities 1 and 2 stations. Apparent discrepancies between reported quantities and NRC-calculated quantities were resolved. No items of noncompliance were identified.

Enforcement Items

No items of noncompliance were identified during the inspection.

Licensee Action on Previously Identified Enforcement Items

Not applicable.

Other Significant Items

A. Systems and Components

None.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

Not applicable.

Management Interview

At the conclusion of the meeting it was agreed that the licensee would report actual in-core uranium burnup and plutonium production data on the reverse of the NRC-742, Materials Status Report forms whenever these quantities differed from data reported on the face of the form. The licensee representatives stated that these differences should tend to be less significant since many of the reasons for past differences have been eliminated.

Present at the discussion were:

L. D. Butterfield, Supervisor, Nuclear Fuel Services
P. C. Kuhel, Group Leader, Nuclear Fuel Services
C. O. Larson, Comptroller's Staff
H. L. Massiu, Group Leader, Nuclear Fuel Services
Joan White, Comptroller's Staff
C. C. Peck, NRC

REPORT DETAILS

Licensee Personnel Supplying Information

L. D. Butterfield
J. P. Hill
P. C. Kuhel
C. O. Larson
H. L. Massiu
Joan White

Scope of Inspection

The inspection was a meeting for the purpose of resolving some apparent discrepancies between uranium and uranium-235 fission and transmutation totals and plutonium production totals reported by the licensee, and corresponding totals manually calculated by NRC inspectors. These data are reported semi-annually on Form NRC/ERDA-742 in accordance with Section 70.53 of 10 CFR Part 70. A comparison of NRC-calculated and licensee reported data for all reporting periods since December 1972 for Dresden 2 and 3 (seven periods) and since June 1974 for Quad-Cities 1 and 2 (four periods) disclosed in general that the reported quantities for the two periods in 1975 appeared incorrect. The manual calculations used by the inspectors cannot be expected to be as accurate generally as the licensee's computerized data, since it is not possible to consider all significant variables in a manual method. However, the manual method normally agrees within 8% with accurate computer data. Since differences were much larger than 8%, the inspection was made to learn the cause of the inconsistencies.

10 CFR Part 70, Section 70.53

On-line process computers are programmed to print out fuel inventories for the Dresden 2 and 3 and Quad-Cities 1 and 2 reactors. For each of the 725 fuel assemblies in each of the reactors, the computer will supply the current inventory of each uranium and plutonium isotope. Facility totals are also provided for the isotopes.

The process computers were first used to generate data for use in completing the NRC-742 forms in July 1975. Until that time an off-line computer program supplied by GE was used to provide the data for these forms.

The licensee explained that the change to use of the on-line computer was responsible for most of the discrepancies between the depletion and production quantities reported and actual in-core depletion and production. Perturbations have also been caused by refuelings, relocations of fuel in the core, and computer rounding methods.

The licensee stated that an effort was made to report ending inventory figures as accurately as possible on the 742 forms. The differences between ending inventory totals and beginning inventory, excluding changes caused by receipts and shipments, therefore represent uranium depletion or plutonium production. Discrepancies in the beginning and ending inventories caused by computer program changes, rounding, refueling, etc show up as apparent depletion and production. There is no other space on the 742 form to indicate such discrepancies. Although these perturbations have been relatively small and insignificant as percentages of inventory totals (less than 0.1%), they can represent more than 10% of depletion or production for a six-month period.

It was stated that the computer programs for Dresden 2 and 3 and Quad-Cities 1 and 2 were currently being modified to improve their inventory accuracy. Presumably this will also mean that reported uranium depletion and plutonium production figures will also be more accurate.

In conclusion it was agreed that the licensee would in the future report actual in-core uranium depletion and plutonium production quantities on the reverse side of the NRC-742 form whenever these data differed from quantities reported on the front of the form.

Attachments 1-4 show comparative licensee-NRC depletion production calculations for the four reactors. For those instances in which the 742-reported data were questioned, the licensee's calculations of actual in-core depletion are shown.

Attachments:
Attachments 1 through 4

Quad-Cities 1

Period	Reported NRC-742	Actual Depl/Prod	NRC Calculated	% Difference
1-6/74				
U	233,222		232,209	-0.0
U-235	122,000		121,917	-0.0
Pu	59,691		56,859	-4.7
7-12/74				
U	424,500		405,718	-4.4
U-235	190,746		201,126	+5.4
Pu	86,120		86,631	+0.6
1-6/75				
U	293,090	368,875	375,135	+1.7
U-235	186,037	175,419	188,614	+7.5
Pu	53,240	80,624	82,383	+2.2
7-12/75				
U	424,500	430,500	427,645	-0.7
U-235	190,746	193,006	207,920	+7.7
Pu	86,120	83,130	85,833	+3.2
Overall				
U		1,457,097	1,440,707	-0.7
U-235		681,171	719,577	+5.6
Pu		309,565	311,706	+0.7

Attachment 1

Quad-Cities 2

Period	Reported NRC-742	Actual Depl/Prod	NRC Calculated	% Difference
1-6/74				
U	447,630		467,158	+4.4
U-235	234,600		249,853	+6.5
Pu	115,726		119,595	+3.3
7-12/74				
U	400,710		404,213	+0.9
U-235	194,612		209,373	+7.6
Pu	91,839		95,743	+4.2
1-6/75				
U	80,113	159,312	161,798	+1.6
U-235	73,615	83,350	86,999	+4.4
Pu	14,248	41,590	41,946	+0.8
7-12/75				
U	455,529	347,750	345,886	-0.5
U-235	192,942	175,524	178,959	+1.9
Pu	93,973	84,305	81,693	-3.1
Overall				
U		1,355,402	1,379,055	+1.7
U-235		688,086	725,184	+5.4
Pu		333,460	338,977	+1.6

Attachment 2

Dresden 2

Period	Reported NRC-742	Actual Depl/Prod	NRC Calculated	% Difference
7/72-6/73				
U	950,050		964,327	+1.5
U-235	572,244		605,926	+5.9
Pu	347,956		332,183	-4.5
7-12/73				
U	436,868		468,967	+7.3
U-235	234,340		255,193	+8.9
Pu	114,008		114,294	+0.0
1-6/74				
U	446,090		418,051	-6.3
U-235	220,836		214,395	-2.9
Pu	80,752		85,372	+5.7
7-12/74				
U	214,595		218,460	+1.8
U-235	98,347		112,913	+14.8
Pu	45,719		46,828	+2.4
1-6/75				
U	78,226	80,375	83,368	+3.7
U-235	52,086	41,815	46,696	+11.7
Pu	17,908	21,030	22,418	+6.6
7-12/75				
U	475,717		479,252	+0.7
U-235	241,571		253,860	+5.1
Pu	115,451		110,596	-4.2
Overall				
U		2,603,695	2,632,425	+1.1
U-235		1,409,153	1,488,983	+5.7
Pu		724,916	711,691	-1.8

Attachment 3

Dresden 3

Period	Reported NRC-742	Actual Depl/Prod	NRC Calculated	% Difference
7/72-6/73				
U	711,025		716,357	+0.7
U-235	391,689		412,948	+5.4
Pu	205,168		203,378	-0.9
7-12/73				
U	530,637		475,096	-10.5
U-235	244,193		264,817	+8.4
Pu	125,825		125,782	-0.0
1-6/74				
U	214,072		231,640	+8.2
U-235	148,237		141,064	-4.8
Pu	73,223		74,626	+1.9
7-12/74				
U	355,478	397,000	397,052	+0.0
U-235	212,082	195,855	211,864	+8.2
Pu	89,160	94,265	92,835	-1.5
1-6/75				
U	221,947	153,263	148,554	-3.1
U-235	67,415	73,010	74,150	+1.6
Pu	27,101	33,490	28,771	-14.1
7-12/75				
U	248,510	264,400	261,066	-1.3
U-235	137,018	136,400	136,792	+0.3
Pu	66,023	60,600	58,128	-4.1
Overall				
U		2,270,397	2,229,765	-1.8
U-235		1,189,384	1,241,635	+4.4
Pu		592,571	583,520	-1.5

Attachment 4