



INTERNAL CORRESPONDENCE

NUCLEAR DIVISION

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To (Name) Mr. R. W. Levin  
Company  
Location

Date April 19, 1966

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Originating Dept.

Answering letter date

Copy to

- Mr. R. C. Baker
- Mr. W. R. Gollither
- Mr. V. G. Katzel
- Mr. W. R. Rossmassler
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Subject Estimates of Transuranium  
Alpha Fed to Paducah Cascade

KY-L-411

Analytical data has been utilized to estimate the quantity of neptunium and plutonium which has been fed to the Paducah cascade. Estimates are summarized first. Then a number of tables are presented to partially substantiate the estimates.

It is estimated that approximately 3 kgs of neptunium has been fed to the cascade. This estimate is based on work by Mr. W. R. Gollither which showed approximately 25% of neptunium receipts entering the cascade. The neptunium is distributed throughout the cascade with peak concentrations deposited at or immediately above reactor tails feed points (from February 1957 through February 1964, reactor tails feed points ranged from Unit 3 to 6 in C-33 and 3 to 5 in C-37). Some neptunium which entered the cascade went out at the top. This is substantiated by the fact that magnesium fluoride traps in C-310 collected approximately one gram neptunium per year for the 18 months in service while reactor tails were being fed.

For the period December 1957 through June 1964, reactor tails feeds totaled 62,410 tons UO<sub>3</sub> or approximately 52,000 tons U. This feed contained approximately 2,847 grams Np<sup>237</sup>. Thus, the neptunium alpha in reactor tails feed amounted to 95 dPM per gram of U. Since only 48% of the non-recycle feed was reactor tails, neptunium contributed 38 dPM per gram of U fed. The highest concentration of neptunium alpha was fed in FY-58. That year, 9410 tons reactor tails UO<sub>3</sub> or approximately 7800 tons U were fed along with 1062 grams of Np<sup>237</sup>. Thus the neptunium alpha amounted to 232 dPM per gram of reactor tails U. Since 48% of the feed was reactor tails, neptunium contributed approximately 111 dPM per gram of non-recycle uranium feed.

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