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ATOMIC ENERGY ACT
OF 1954

Westinghouse

Date: March 6, 1962

From: L. O. Ricks

Subject: Dose Rates from an
Unshielded Engine

To: F. D. Retallick

cc: H. F. Faught

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The attached memo contains information requested by Aerojet
General Corporation on February 2, 1962. These data supercede the hand estimates
transmitted by phone on February 13. This memo is transmitted to you for your file
and transmittal by Mr. Faught to AGC to the attention of Mr. A. H. Flag.

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SPECIAL REVIEW DETERMINATION	Reviewer	Class.	Date
	DBW	u	5-6-82
Class: u			

Classification cancelled (or changed to) _____
by authority of _____
by *H. Faught* DTIE, date *7-14-75*

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ATOMIC ENERGY ACT

Westinghouse

WANL - TME - 020

Date: March 6, 1962

From: L. O. Ricks

Subject: Dose Rates from an
Unshielded Engine

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The attached table gives the dose rate ten feet from an unshielded Phoebus engine 24 hours after shutdown. The attached graph shows the relative dose rate, in three energy groups, for decay times up to 30 days. These data were requested by Aerojet General Corporation for comparison with the dose rates from an unshielded core. Values for a NERVA engine may be obtained by multiplying the tabulated values by the power ratio of the two engines.

The analysis for the engine radiation levels was performed in 8 gamma energy groups using the computer shielding program 14-0. The analysis includes only radiation from the decay of fission products in the core, the activity due to component activation being negligible. The data for the 8 energy groups were reduced to three equivalent groups and a curve was drawn to show the change in the dose rate contribution for each of the 3 groups for decay times from 24 hours to 30 days.

These data further supplement WANL-TME-017, titled Dose Rates from an Unshielded Core, and were used to obtain the equivalent point sources for the engine as given in Table 2 of WANL-TME-019 titled Equivalent Engine Radiation Sources, dated February 27, 1962.

Classification cancelled (or changed to)

by authority of

T10-1400-82

by

[Signature]

DTIC, date

7-14-75

L. O. Ricks

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OF 1954

SPEC. A. REVIEW FOR DETERMINATION	Reviewers	Class.	Date
	DBW	4	5-6-82
		Class:	4

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GAMMA RADIATION LEVEL FROM THE SIDE
OF AN UNSHIELDED PHOEBUS ENGINE

AT 4000 MW

Energy Group	Average Energy (mev)	14-0 Code Output (R/hr) x 10 ⁻³
1	0.4	1.1
2	0.7	11.3
3	1.0	3.2
4	1.5	2.7
5	2.0	4.0
6	2.5	0.36
7	2.8	0.0065
8	3.5	0.0066
Total		22.67
I	0.8	12.41
II	1.5	5.87
III	2.5	4.39
Total		22.67

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RELATIVE RADIATION LEVEL

VS

DECAY TIME

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For 24 hours to 30 days decay of fission
products from 3-20 min runs in one month

LOGARITHMIC 359T-110
KEUFFEL & ESSER CO. MADE IN U.S.A.
2 X 2 CYCLES ALBANY, N.Y.

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TIME AFTER SHUTDOWN
HRS.

Curve No. 547306
March 7, 1962