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IPD PRODUCTION PROJECTIONS

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IPD PRODUCTION PROJECTIONS

Two changes have been incorporated in the tables of this draft:

- (1) The lithium-aluminum tonnages required for blanket and E-N loadings have been changed.
- (2) The production numbers for the small production reactors have been reduced per AEC direction, and a separate table is included for these numbers.

We presently plan on issuing complete cost and production calculations for both the AEC and GE numbers. It is suggested that the incremental changes in throughputs from the initial GE cases can possibly be handled on a completely incremental cost basis.

REVIEWED BY
L. W. LANG

Principal Engineer-Reactor Process

MASTER

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C Reactor

	<u>Regular</u>	<u>Blanket</u>	<u>E-N</u>
Power Level, Avg. MW	2 191	2 191	2 191
Percent to Nat	76	66	-
E	24	34	100
Operating Efficiency (percent)	75.7	76.7	77.7
TOE	80.3	80.3	81.3
LOE	94.3	95.5	96.0
KMWD to - Nat	460.7	404.9	
E Spike	145.5	85.9	87.0
E Blanket		122.7	124.3
E Core			410.1
Total	606.2	613.5	621.4
Exposure - Nat (MWD/T)	600	600	-
E	810	810	810
Tonnage - Nat	767.2	674.8	
E Spike	179.4	106.0	107.4
Blanket		151.4	153.4
Core			506.2
LiAl		1.5	5.1
Conversion Ratios - g Pu or equiv./MWD			
Nat	.856	.856	
E - Spike	.701	.715	.729
Blanket		.729	.729
Core			.729
T ₂ - Blanket		.185	.185
Core			.193
Leakage*		.017	.017
Production - Annual kg or equiv.			
Pu- Nat	394.3	346.6	
E - Spike	102.0	61.4	63.4
Fringe		89.7	90.6
Core			299.0
T ₂ - Blanket		22.7	23.0
Core			79.1
Leakage		10.4	10.6
Total Pu	496.3	497.7	453.0
Total T ₂		33.1	112.7 X

* Based on 1% of neutrons formerly lost to leakage captured in LiAl.

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K Reactors

	<u>Regular</u>	<u>Blanket</u>	<u>E-N</u>
Power Level, Avg. MW	4 400	4 400	4 400
Percent to Nat	88	78	
E	12	22	100
Operating Efficiency	81.0	81.6	82.5
TOE	85.0	85.0	85.5
LOE	89.3 93.3	96.0	96.5
KMWD to Nat	1 144.7	1 022.0	
E - Spike	156.1	131.0	132.5
Blanket		157.2	159.0
Core			1 033.3
Exposure - Nat	630	630	
E	870	870	870
Tonnage			
Nat	1 817.0	1 622.2	1 523.0
E	179.4	331.3	
LiAl		2.0	13.0
Conversion Ratios - g Pu or equiv./MWD			
Nat	.918	.918	-
E - Spike	.749	.764	.779
Blanket		.779	.779
Core			.779
*T ₂ - Blanket		.165	.165
Core			.174
Leakage		.009	.009
Production (kg or equiv./yr.)			
Pu - Nat	1 050.8	938.2	
E - Spike	116.9	100.1	103.2
Fringe		122.4	123.9
Core			804.9
T ₂ - Blanket		25.9	26.2
Core			179.8
Leakage		11.8	12.0
Total Pu	1 167.7	1 160.7	1 032.0
Total T ₂		37.7	218.0

* Use .165 (Decay 7% for Blanket); .174 (Decay 2.8 for Core).

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Small Reactors

	<u>Regular</u>	<u>Blanket</u>	<u>E-N</u>
Power Level, Avg. MW	1 960	1 960	1 960
Percent to Nat	85	75	
E	15	25	
Operating Efficiency (percent)	76.8	77.8	78.8
TOE "	81.3	81.3	81.7
LOE "	94.5	95.7	96.5
KMWD to - Nat	466.9	417.5	
E - Spike	60.4	61.2	62.0
E - Blanket	22.0	77.9	78.9
E - Core			422.7
Total	549.3	556.6	563.6
Exposure - Nat (MWD/T)	600	600	-
E	790	790	790
Tonnage - Nat	778.2	695.8	
E	104.3	176.1	713.4
L1A1	0.1	1.5	5.1
Conversion Ratios - g Pu or Equiv/MWD			
Nat	.848	.848	
E - Spike	.694	.708	.722
Blanket	.708	.722	.722
Core			.722
T ₂ - Blanket	.185	.185	.185
Core			.193
Leakage	.004	.017	.017
Production - Annual kg or equiv.			
Pu - Nat	395.9	354.0	
E - Spike	41.9	43.3	
Fringe	15.6	56.2	
Core			406.9
T ₂ - Blanket	4.1	14.4	14.6
Core			81.6
Leakage	2.2	9.5	9.6
Total Pu	453.4	453.5	406.9
Total T ₂	6.3	23.9	105.8

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AEC Production Numbers
Small Reactors

	<u>Regular</u>	<u>Blanket</u>	<u>E-N</u>
Power Level, Avg. MW	1 960	1 960	1 960
Percent to Nat	85	75	
E	15	25	
Operating Efficiency (percent)	73.5	74.5	75.4
TOE "	77.8	77.8	78.2
LOE "	94.5	95.7	96.5
KMWD to - Nat	446.9	399.6	
E - Spike	57.8	58.6	59.3
E - Blanket	21.1	74.6	75.5
E - Core			404.6
Total	525.8	532.7	539.4
Exposure - Nat (MWD/T)	600	600	-
E	790	790	790
Tonnage - Nat	744.9	666.0	
E	99.8	168.6	682.8
L1A1	0.1	1.5	5.1
Conversion Ratios - g Pu or Equiv./MWD			
Nat	.848	.848	
E - Spike	.694	.708	.722
Blanket	.708	.722	.722
Core			.722
T ₂ - Blanket	.185	.185	.185
Core			.193
Leakage	.004	.017	.017
Production - Annual kg or equiv.			
Pu - Nat	378.9	338.8	
E - Spike	40.1	41.4	
Fringe	14.9	53.8	
Core			389.5
T ₂ - Blanket	3.9	13.8	14.0
Core			78.1
Leakage	2.1	9.1	9.2
Total Pu	434.0	434.0	389.5
Total T ₂	6.0	22.9	101.3

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