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HW-69550 RD

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TITLE
OLD FILE OPERATION WITH VARYING AMOUNTS OF E-METAL

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by

L. W. LANG

May 11, 1961

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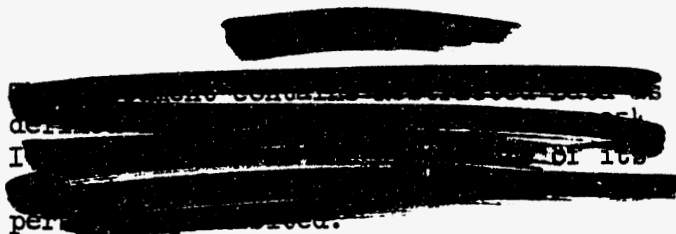
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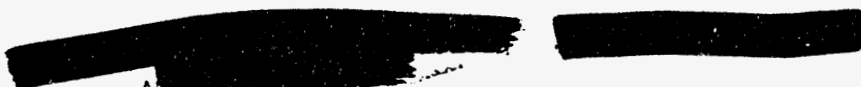
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OLD PILE OPERATION WITH VARYING AMOUNTS OF E-METAL

HW-69550 RD

	<u>Present Operation</u>		<u>Blanket</u>		<u>E-N</u>		<u>Overbore Cases</u>					
	<u>Nat</u>	<u>.947</u>	<u>Nat</u>	<u>.947</u>	<u>Nat</u>	<u>.947</u>	<u>Base</u>		<u>With Blanket</u>		<u>With E-N</u>	
							<u>Nat</u>	<u>.947</u>	<u>Nat</u>	<u>.947</u>	<u>Nat</u>	<u>.947</u>
% of Pile Power	92.3	7.7	67.8	32.2	0	100	67.6	32.4	49.1	50.9	0	100
Exposure	650	750	700	800		800	700	800	700	800		800
<u>Conversion Ratio</u>												
Pu	.846	.714	.856	.726		.758	.998	.873	1.008	.884		.916
Tritium (Pu equiv/MWD)				.193		.202				.089		.146
% 240	5.80	5.25	6.15	5.45		5.45	6.15	5.45	6.15	5.45		5.45
<u>Over-All Conversion</u>												
Pu (g/MWD)	.836		.814			.758	.957		.945		.916	
Tritium (Pu equiv/MWD)			.062			.202			.045		.146	
TOTAL	<u>.836</u>		<u>.876</u>			<u>.960</u>	<u>.957</u>		<u>.990</u>		<u>1.062</u>	
% 240	5.70		5.95			5.45	5.94		5.82		5.45	
% Increase Conv. Ratios	--		4.8			14.8	14.6		18.5		27.1	
<u>Combined Operation %</u>												
Increase (SR Makes .889 g Pu/equiv T ₂)	--		3.9			12.2	14.6		17.8		24.0	
Over-All Efficiency (% Change)	--		-1%			-2%	+2%		+1%		Unchanged	

Miscellaneous Information

K-Piles Conversion Ratio Increase 3.3% for Blanket
 9.8% for E-N
 Total Tritium from Blanket 4.0 kg
 E-N 13.0
 GVR Ratio (Total Gas) E-N 9.0
 Blanket
 @ 1-1/2 yr 6-12.0

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Reference: HW-68697, "Comparative Return for Overbore and E-N Overbore and E-N Loadings, B, D, F and DR Reactors," Nechodom, W. S. (3-22-61).

	Base		Blanket		E-N	
	Net	E	Net	E	Net	E
Low. Exp.	600	700	600	700	700	700
	Net	F	Costs	Cont.	†	
750	941	1,908	941	175	74.0	26.0
		7.5		113		
% Pil. Pass	58.7	2.54	66.4	6.1	↓ .833	.181
		10.5			.189	173
					1,0058	

32.0%
9.8%

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Conf. Underway
March 31, 1961

K. P. Foster
Washington

Calculate (GVR)

Base

$$\begin{array}{r}
 \text{Avg. } .856 \times 62.6 \quad 536 \\
 .825 \times 29.7 \quad \underline{24.5} \\
 \hline
 88.1 / 92.3 = .846 \times 5.8
 \end{array}$$

E-N Core + Blanket

		P_{in}
.772	$\times 69.5$.5365
.206		1432
.726	$\times 30.5$	2214
.143		<u>584</u>
		7579 2021

O Core

1.008	$\times 46.5$.4687	
.976	21.1	<u>2059</u>	$6746 / 67.6 = 998$
.883	16.0		
.863	16.4		
		<u>957</u>	.873

O Bone Core + Blanket

$$.834 \times .339 = .0454 / .509 = .089$$

E-N

.931	$\times 67.6$	6294	
.152			1028
.885	32.4	<u>2867</u>	.916
.134		9161	
		<u>434</u>	.146
		1462	

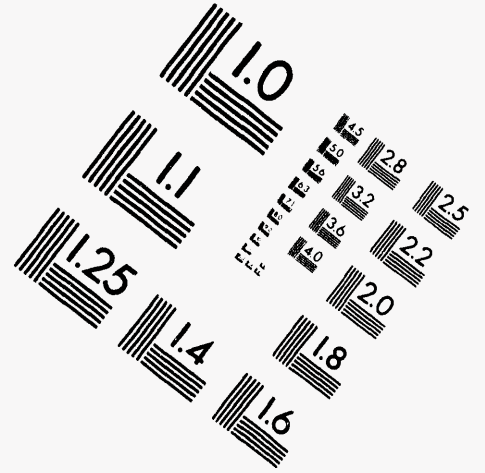
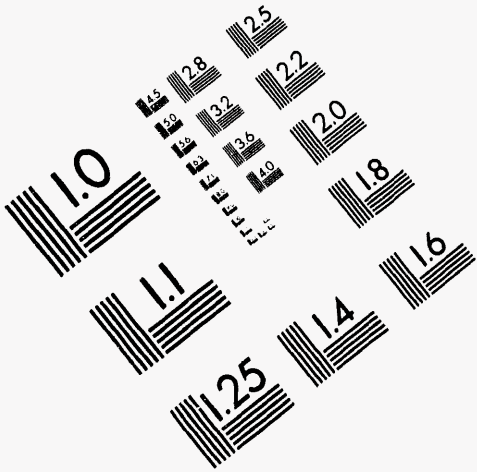
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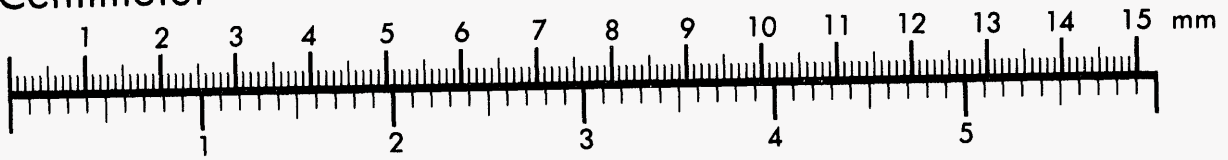
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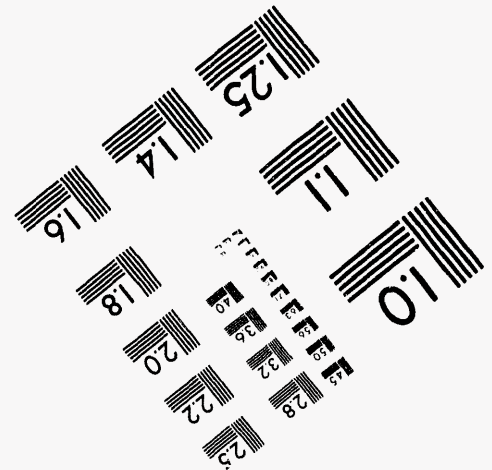
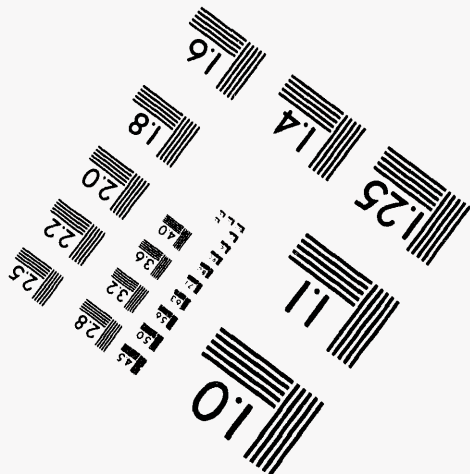
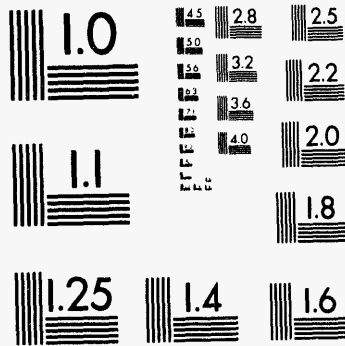
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Centimeter



Inches



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12/16/94

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