

HQ File

TMI DOCUMENTS

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TM-0973

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8105150489

# PRIMARY COOLANT

SAMPLE DATA

TM 0973; R-165

Bettis -

4-IX-79 Sample

Rec'd from

J. Daniel

0804 hrs 4/13/79

All values corrected  
to 3-30-79 @ 1200

1600 call from  
Bogart

PH

7.65

Strontium (mostly 90 at this point)  
Radiochemical Analysis

$7.3 \times 10^2 \mu\text{C}/\text{ml}$

Xe <sup>133</sup>G

$< 300 \mu\text{C}/\text{ml}$

mca

Xe

LA <sup>140</sup>

(used BA <sup>140</sup> half life)  
 $T_{1/2} = 12.8 \text{ hr}$

$2.7 \times 10^2 \mu\text{C}/\text{ml}$

minimum  
detectable

Ba <sup>140</sup>

$4.2 \times 10^2 \mu\text{C}/\text{ml}$

Cs <sup>134</sup>

$7.5 \times 10^1$

Cs <sup>136</sup>

$2.1 \times 10^2$

Cs <sup>137</sup>

$3.4 \times 10^2$

I <sup>131</sup>

$2.4 \times 10^4$

## RADIOCHEMICAL Analysis

Cs <sup>137</sup>

$\begin{bmatrix} 2.8 \times 10^2 \\ 3.0 \times 10^2 \end{bmatrix}$

Duplicate

Cs <sup>136</sup>

$\begin{bmatrix} 1.8 \times 10^2 \\ 1.8 \times 10^2 \end{bmatrix}$

Analysis

Cs <sup>134</sup>

$\begin{bmatrix} 7.2 \times 10^1 \\ 7.3 \times 10^1 \end{bmatrix}$

Ba <sup>140</sup>

$\begin{bmatrix} 4.0 \times 10^2 \\ 3.9 \times 10^2 \end{bmatrix}$

... t ... analysis by 2100 4/14/79

19-165

DATE	3/29/79	4/10/79	4/16/79	4/14/79	4/16/79	4/18*
TIME	1700					
SAMPLE	RCS	RCS	RCS	RCS	RCS	RCS
POINT	BETTIS	ORNL	BETTIS	INEL.	B&W/LRC	B&W
UNITS	μCi/cc	μCi/cc	μCi/cc	(NRC)	μCi/cc	(from. Ref. trailer)
Ba 137M						
Ba 139						
Ba 140						
Cs 134	2.1 x 10 <sup>1</sup>	1.7 x 10 <sup>2</sup>	2.2 x 10 <sup>2</sup>		1.69 x 10 <sup>2</sup>	
Cs 136	6.3 x 10 <sup>1</sup>	7.7 x 10 <sup>1</sup>	7.5 x 10 <sup>1</sup>		7.3 x 10 <sup>1</sup>	
Cs 137	1.75 x 10 <sup>2</sup>	1.2 x 10 <sup>2</sup>	1.1 x 10 <sup>2</sup>		1 x 10 <sup>2</sup>	
Cs 137	2.7 x 10 <sup>2</sup>	3.2 x 10 <sup>2</sup>	3.4 x 10 <sup>2</sup>		2.5 x 10 <sup>2</sup>	
Cs 153						
Ce 144		1.05 x 10 <sup>2</sup>				
Mo 99		1.3 x 10 <sup>2</sup>			1.7 x 10 <sup>2</sup>	
Rb 86						
Ru 106						
Sr 89		1.5 x 10 <sup>3</sup>	7.3 x 10 <sup>2</sup>			
Sr 90			6 x 10 <sup>2</sup>			
Sr 91			5 x 10 <sup>1</sup>			
Y 90						
Y 91						
Zr-95						

I-131	1.3 X 10 <sup>4</sup>	4.6 X 10 <sup>-4</sup>	1.2 X 10 <sup>-4</sup>	8.5 X 10 <sup>-3</sup>	7.3 X 10 <sup>-2</sup>	1.2 X 10 <sup>-1</sup>	2.2 X 10 <sup>-1</sup>
I-132							
I-133	4.6 X 10 <sup>4</sup>						
I-134							
I-135							
Br 84							
Br 85							
Xe 131m					7.4 X 10 <sup>-2</sup>	1.13 X 10 <sup>-1</sup>	10.13 %
Xe 133m					5.5 X 10 <sup>-2</sup>	2.3 X 10 <sup>-2</sup>	17.9 %
Xe 133						3.66 X 10 <sup>-1</sup>	
Xe 135m							
Xe 135							
Xe 138							
Kr 83m							
Kr 85m							
Kr 85							
Kr 87							
Kr 88							
SADSS α	3.6 X 10 <sup>-4</sup>	< 1 X 10 <sup>-3</sup>					
U		< 10 PPB	< 10 PPB				
TH			1.2		< 11		
BORON					3449 DPM	3930 DPM	3568 ± 30 DPM
PH					8.4	8.3	8.3
H <sub>2</sub>						31.2 cc/kg	31.9 cc/kg
O <sub>2</sub>						4.6 cc/kg	1.8 cc/kg
N <sub>2</sub>						32.8 cc/kg	18.1 cc/kg

41.8 cc/kg

T.G.

Kr 85m									
Kr 85									
Kr 87									
Kr 88									
GRASS	$3.6 \times 10^{-4}$	$< 1 \times 10^{-3}$							
Li		$< 10 \text{ PPB}$	$< 1 \phi \text{ PPB}$						
3H			1.2						
BORON									
PH									
HZ									
OZ									
NZ									

T.G.

\* Taken from RCA blackboard on 4/19 @ 1230 JTW.

41.8 cc/kg

3930 ppm  
8.3  
31.2 cc/kg  
4.6 cc/kg  
32.8 cc/kg

3419 ppm  
8.4

1.1

3568 ± 30 ppm  
8.3  
21.9 cc/kg  
1.8 cc/kg  
18.1 cc/kg



*Does not include  
liquid volume in containment*

1st Primary Coolant Sample  
3/29/79 Bettis

2nd Primary Coolant Sample - 4/10/79

Nuclide	T 1/2	1st Origen run		2nd Origen-corrected MTU		SRL		ORNL		Bettis	
		Coolant concentration ( $\mu\text{Ci/cc}$ )	Fraction of Core in Coolant	Coolant concentration ( $\mu\text{Ci/cc}$ )	Fraction of Core in Coolant	Coolant concentration ( $\mu\text{Ci/cc}$ )	Fraction of Core in Coolant	Coolant concentration ( $\mu\text{Ci/cc}$ )	Fraction of Core in Coolant	Coolant concentration ( $\mu\text{Ci/cc}$ )	Fraction of Core in Coolant
I-131	8d	$1.3 \times 10^4$	0.065	$1.3 \times 10^4$	0.000	$4.6 \times 10^3$	0.00	$8.2 \times 10^3$	0.155	$8.5 \times 10^3$	0.16
I-133	20.8h	$6.5 \times 10^3$	0.00	$6.5 \times 10^3$	0.000						
Cs-134	2Y	$6.3 \times 10^1$	0.06	$6.3 \times 10^1$	0.060	$7.7 \times 10^1$	0.076	$8.2 \times 10^1$	0.091	$7.5 \times 10^1$	0.084
Cs-135	13d	$1.8 \times 10^2$	0.08	$1.8 \times 10^2$	0.10	$1.2 \times 10^2$	0.12	$1.1 \times 10^2$	0.12	$1.1 \times 10^2$	0.12
Cs-137	30Y	$2.8 \times 10^2$	0.10	$2.8 \times 10^2$	0.11	$3.2 \times 10^2$	0.11	$3.1 \times 10^2$	0.13	$3.4 \times 10^2$	0.13
Sr-99	50d	5.3	0.00003	5.3	0.00003	$1.5 \times 10^3$	0.009	$6 \times 10^2$	0.0042	$7.3 \times 10^2$	0.004
Sr-90	29Y							$5 \times 10^1$	0.022		
Ru-106	360d	$2.0 \times 10^2$	0.019	$2.0 \times 10^2$	0.022						
Ba-140	12.8d	$2.0 \times 10^2$	0.0006	$2.0 \times 10^2$	0.0006	$1.7 \times 10^2$	0.00093	$2.9 \times 10^2$	0.0010	$2.2 \times 10^2$	0.0014
La-140	40h					$1.4 \times 10^2$	0.00055	$1.6 \times 10^2$	0.00006	$1.4 \times 10^2$	0.00075
Yb-93	66h					$1.3 \times 10^2$	0.0107	$1.79 \times 10^2$	0.017		
Te-132	70h	$2.0 \times 10^2$	0.0008	$2.0 \times 10^2$	0.0012						
Ce-144	280d					$1.05 \times 10^2$	0.0001				
La-136m	0.35 rough- ter, g Cs-136					$9.1 \times 10^1$	0.55				
Gross		$3.6 \times 10^{-4}$		$3.6 \times 10^{-4}$	$1 \times 10^{-10}$	$<1 \times 10^{-3}$	$<1 \times 10^{-8}$				
U						$<10 \text{ ppb}$		$<10 \text{ ppb}$			
U	17Y							1.2	0.1		