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Released 1994

**Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830**

**Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
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ZIRCONIUM TUBE SAMPLE EVALUATION PROGRAM

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1. WK Winegardner

ZIRCONIUM TUBE SAMPLE EVALUATION PROGRAM

W. E. Korpi

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ZIRCONIUM TUBE SAMPLE EVALUATION PROGRAM

<u>Sample#</u>	<u>Tube #</u>	<u>Pos.</u>	<u>Charged</u>	<u>Disch.</u>	<u>Oper. Days</u>	<u>Ave. Temp.</u>	<u>Ave. Flow</u>
F-1	2364-KE	3	4-12-65	6-24-65	59.69	101.5	66.7
F-2	2364-KE	4	4-12-65	6-24-65	59.69	101.5	66.7
F-3	2384-KE	3	4-12-65	5-21-65	30.45	110.1	66.2
F-4	2384-KE	4	4-12-65	8-9-65	97.07	110.1	66.2
F-5	2384-KE	3	5-21-65	8-9-65	66.62	110.1	66.2
F-6	2364-KE	4	6-23-65	8-9-65	37.38	108.1	68.4
F-11	2364-KE	3	6-23-65	8-9-65	37.38	103.1	63.4
F-12	4370-KW	4	6-27-65				
F-13	4370-KW	3	6-27-65	11-15-65	106.42	103.1	74.8
F-7	4166-KW	4	6-27-65	2-14-66	168.66	101.3	73.2
F-9	4166-KW	3	6-27-65	2-14-66	163.34	101.3	73.2
F-20	2589-KE	3	10-23-65	12-2-65	29.93	104.1	76.2
F-21	2589-KE	4	10-23-65				
F-16	3869-C		11-22-65	3-18-66	Lost		
F-17	3369-C		11-22-65	3-13-66	Lost		
F-13	3873-C		11-22-65	3-18-66	Lost		
F-19	3873-C		11-22-65	3-18-66	Lost		
22	5080-KE	19	2-22-66				
23	5030-KE	4	2-22-66				

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DOWNSTREAM DUMMY AND COUPON EXPOSURE

TUBE	TYPE DUMMIES	CODE	DATE CHARGED	DATE DISCHARGED	AVG TEMP	AVG FLOW	TOTAL OPER DAYS	REMARKS
2559-KE	Anodized/nickel heat treated comb.	X	7-27-66	11-8-66	108	72.2	52.8854	Original weights on second sheet.
2560-KE	Anodized (specials) 300 Area	D	7-27-66	11-28-66	108	72.3	71.3423	
2561-KE	Anodized (specials) 300 Area	C	7-27-66	11-28-66	107	69.3	71.3423	
2562-KE	Aluminum 6063	78	7-27-66	11-28-66	109	72.0	71.3423	Original weights on second sheet.
3181-KE	2 Mil Nickel	None	5-3-66	11-28-66	106	71.3	127.6630	
3887-KW	Al-1A Coupon		4-25-66	10-29-66	104.9	73.4	105.8	
3887-KW	S/S-14 Coupon		4-25-66	10-29-66	104.9	11	105.8	

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DUMMY

TYPE

WEIGHT

78-A	Perf	231.835
78-B	Perf	232.022
78-C	Tubular	255.521
78-D	Tubular	256.075
78-E	Tubular	255.666
78-F	Tubular	255.591
78-G	Tubular	255.761
78-H	Tubular	255.541
78-I	Tubular	256.016
78-J	Tubular	255.410
No Number	Anodized Perf	No weight given
X-11	Nickel Perf	228.3487
X-13	Nickel Tubular	262.6228
X-3	Nickel Tubular	259.8358
X-14	Nickel Tubular	272.3731
X-15	Nickel Tubular	270.0434
X-5	Nickel Tubular	258.7096
X-16	Nickel Tubular	273.8524
X-4	Nickel Tubular	249.5229
X-17	Nickel Tubular	266.4898

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ZIRCONIUM TUBE SAMPLE EVALUATION PROGRAM

<u>Piece #</u>	<u>Charge Date</u>	<u>Discharge Date</u>	<u>Temperature</u>	<u>Oper. Days</u>
15 13	4-25-66	4-19-67	103.8	246.8
4A 2A	4-25-66	4-19-67	103.8	246.8

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IRONIUM TUBE SAMPLE EVALUATION PROGRAM

<u>Tube</u>	<u>Sample No.</u>	<u>Charged</u>	<u>Discharged</u>	<u>Temperature</u>	<u>Flow</u>	<u>Oper. Days</u>
5080KE	22	2-22-66	5-4-66	88.7	72.7	56.8
5080KE	23	2-22-66	5-4-66	88.7	72.7	56.8

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ZIRCONIUM TUBE SAMPLE EVALUATION PROGRAM

(Exposure of Coupons From Tube 3879-KW)

<u>Tube No.</u>	<u>Coupon No.</u>	<u>Charge Date</u>	<u>Discharge Date</u>	<u>Average Temperature</u>	<u>Operating Days</u>
3879-KW	13	4-25-66	12-4-67	104.7	430.0
3879-KW	2A	4-25-66	12-4-67	104.7	430.0

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105-KW
SAMPLE COUPON DATA

Distributions

1. H. K. Winegardner, BNU
2. W. K. Alexander
3. H. C. O'berg.

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TUBE NO.	COUPON HOLDER NO.	POSITION FROM REAR	OPERATING TIME		FLOW	OUTLET TEMP.	DATE CHARGED	DATE DISCHARGED	REMARKS
			DATE As Of:	DAYS					
3166	A-1	4	5/5	102.0406	69.8	103.8	12-29-68	5-5-69	
	B-3	5	5/5	102.0406	69.8	103.8	12-29-68	5-5-69	
	A-9	4	6/15/69	23.0450	69.6	110.5	5-5-69		
	B-2	5	"	"	"	"	"		
3169	B-4	4	6/15/69	125.0856	69.8	105.6	12-29-68		
	A -2	5	"	"	"	"	"		
3170	A-3	4	6/15/69	125.0856	71.5	103.0	12-29-68		
	B-5	5	"	"	"	"	"		
3171	B-6	4	6/15/69	125.0856	70.4	103.4	12-29-68		
	A-4	5	"	"	"	"	"		
3175	A-5	4	6/15/69	125.0856	69.8	100.6	12-29-68		
	B-7	5	"	"	"	"	"		
3176	B-8	4	6/15/69	125.0856	70.7	99.6	12-29-68		
	A-6	5	"	"	"	"	"		
3178	A-7	4	5-5-69	102.0406	70.4	97.9	12-29-68	5-5-69	
	B-9	5	"	"	"	"	"	5-5-69	
	A-10	4	6-15-69	23.0450	70.3	106.6	5-5-69		
	B-11	5	"	"	"	"	"		

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105-KW
SAMPLE COUPON DATA

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TUBE NO.	COUPON HOLDER NO.	POSITION FROM REAR	OPERATING TIME		FLOW	OUTLET TEMP.	DATE CHARGED	DATE DISCHARGED	REMARKS
			DATE AS OF:	DAYS					
3180	B-10	4	5-5-69	102.0450	71.1	97.2	12-29-68	5-5-69	"
	A-8	5	"	"	"	"	"	"	"
	A-11	4	6-15-69	23.0450	71.2	105.7	5-5-69	"	"
	B-12	5	"	"	"	"	"	"	"
3181	S/S-11	7	6-15-69	125.0856	72.2	96.6	12-29-69	5-5-69	"
	S/S-12	5	5-5-69	102.0406	72.2	94.6	12-29-69	5-5-69	"
	S/S-14	6	6-15-69	125.0856	72.2	96.6	"	"	"
	S-S-13	5	"	23.0450	72.2	102.1	5-5-69	"	"

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SAMPLE COUPON DATA

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TUBE NO.	COUPON HOLDER NO.	POSITION	OPERATING TIME	DATE	AS OF:	FLOW	OUTLET TEMP.	DATE CHARGED	DATE DISCHARGED	REMARKS
3166	A-9	4	9-3-69	90.1527	69.8	112.2	5-5-69			V
	B-2	5	"	"	"	"	"	"	"	lost
3169	B-4	4	"	192.1933	70.2	110.3	12-29-68	9-3-69	"	
	A-2	5	"	"	"	"	"	"	"	
3170	A-3	4	"	192.1933	70.6	108.2	12-29-68	9-3-69	"	
	B-5	5	"	"	"	"	"	"	"	
3171	B-6	4	"	192.1933	70.6	109.2	12-29-68			V
	A-4	5	"	"	"	"	"	"	"	V
3175	A-5	4	"	192.1933	69.7	107.0	12-29-68			V
	B-7	5	"	"	"	"	"	"	"	V
3176	B-8	4	"	192.1933	70.4	106.1	12-29-68			V
	A-6	5	"	"	"	"	"	"	"	V
3178	A-10	4	"	90.1527	70.3	105.5	5-5-69			V
	B-11	5	"	"	"	"	"	"	"	V
3180	A-11	4	"	90.1527	71.3	110.1	5-5-69	9-3-69	"	
	B-12	5	"	"	"	"	"	"	"	

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SAMPLE COUPON DATA

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SAMPLE COUPON DATA

TUBE NO.	COUPON HOLDER NO.	POSITION FROM REAR	OPERATING TIME		FLOW	OUTLET TEMP.	DATE CHARGED	DATE DISCHARGED	REMARKS
			DATE AS OF:	DAYS					
3166	A-9	4	1-31-70	205.5672	68.4	108.5	5-5-69	1-31-70	
3171	B-6	4	"	307.6078	69.4	107.8	12-29-68	1-31-70	
	A-4	5	"	"	"	"	"	"	
3175	A-5	4	"	307.6078	68.1	106.1	12-29-68	1-31-70	
	B-7	5	"	"	"	"	"	"	
3176	B-8	4	"	307.6078	69.0	105.2	12-29-68	1-31-70	
	A-6	5	"	"	"	"	"	"	
3178	A-10	4	"	205.5672	68.7	104.8	5-5-69	1-31-70	
	B-11	5	"	"	"	"	"	"	
3181	S/S-11	4	"	307.6078	69.4	101.3	12-29-68	1-31-70	
NOTE: Two coupon holders were not recovered prior to reactor tube discharges and consequently lost as of 9-3-69. They were holders identified as B-2 from tube 3166-KW and S/S-12 from tube 3181-KW.									

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