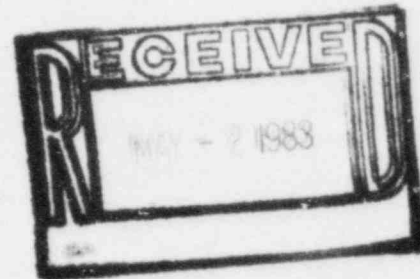


DMB

Omaha Public Power District  
1623 Harney Omaha, Nebraska 68102  
402/536-4000

April 28, 1983  
LIC-83-109

Mr. W. C. Seidle, Chief  
Reactor Project Branch 2  
U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011



Reference: Docket No. 50-285

Dear Mr. Seidle:

Gas Sampling Evaluation Program

Your letter dated March 29, 1983 requested the District to evaluate our present capabilities for gas sampling at the Fort Calhoun Station. The District has completed an evaluation program for the reactor coolant system gas samples and believe we have proven that we can obtain representative samples for reactor coolant system gas. The District has not completed its evaluation for sampling waste decay tanks. The present status of this program is provided in the attachment, as well as data from the reactor coolant system gas sampling program.

Sincerely,

*R L Jaworski for*

W. C. Jones  
Division Manager  
Production Operations

WCJ/TLP:jmm

Attachment

cc: LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, N.W.  
Washington, D.C. 20036

Mr. L. A. Yandell, Senior Resident  
Inspector

8306300069 830428  
PDR ADOCK 05000285  
P PDR

1E31  
111

## Attachment

### STATUS OF FORT CALHOUN STATION GAS SAMPLING EVALUATION PROGRAM

An evaluation of reactor coolant gas (RCG) analysis was made on the basis of eight RCG analyses. These analyses were performed in three sets at three different reactor power levels by three different technicians. The third set includes four analyses, the first three of which were performed by one technician and the fourth was performed by a different technician. The results within each set are at the level of agreement as defined by 50-285/82-21, Attachment 1, and are summarized in Table I. A comparison of results obtained by different technicians is expected to be made after reactor power stabilizes and equilibrium is established.

A program for verifying representative sampling of gas decay tanks has been developed and is partially complete. Tests completed by April 27, 1983 include repeated sampling and analysis from routine sample station WD-32 with varying purge times and different technicians all from one gas decay tank. A procedure for sampling of a gas decay tank from an alternate sample point has been developed and a program of repeat sampling and analysis using this procedure has been initiated. To date, results are inconclusive, possibly due to the extremely low activity of the only isolated gas decay tank available. It is expected that a definitive set of results will be obtained from a gas decay tank of higher specific activity. Such an inventory is expected to be available by May 15, 1983 and the program described to be performed on it.

It is believed that the measurement program conducted on RCG analysis demonstrates the procedure for gas analysis provides representative samples for counting purposes and that the disagreements identified in the recent confirmatory measurements program have been corrected by the recalibration of the gamma isotopic counters. It is expected that the check of gas decay tank representative sampling will demonstrate the methods and techniques for that sampling do provide representative samples and that the disagreements noted in the confirmatory measurements program have also been resolved by the recalibration of the gamma isotopic counters.

TABLE I  
REACTOR COOLANT GAS SAMPLING SUMMARY

<u>Nuclide</u>	<u>Resolution r.e. 4/21/83, 0125</u>	<u>Ratio #2/#1 (89% PWR)</u>	<u>Resolution r.e. 4/22/83, 1913</u>	<u>Ratio #4/#3 (79% PWR)</u>	<u>Resolution r.e. 4/23/83, 1246</u>	<u>Ratio Min/Max of #5 Thru #8*</u>
Xe-133	558	.96	503	1.05	713	.90
Kr-85M	238	.99	232	.976	303	.91
Kr-88	163	.98	159	.99	204	.90
Xe-133M	9.1	1.32	7.9	1.04	6.9	.64
Xe-135	666	.97	587	.99	769	.91
Kr-87	139	.94	133	.99	169	.90
Xe-138	58	.93	59	.92	64	.80
Xe-135M	79	.96	76	1.02	90	.78
Ar-41	84	.97	76	.95	94	.87

\*Reactor power increased from 91% to 92.1% during these analyses.

X.  
CMP-4.52-2  
FC-340  
R1 8-11-82  
1 OF 2

Kx  
79%

#1

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.21.1983

SAMPLE TIME 208

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 7.51E-01 UCI/CC

KR-85M = 8.61E-02 UCI/CC

KR-88 = 1.24E-01 UCI/CC

XE-133M = 1.39E-02 UCI/CC

XE-135 = 4.72E-01 UCI/CC

KR-87 = 1.04E-01 UCI/CC

XE-138 = 5.78E-02 UCI/CC

N-13 = 3.85E-02 UCI/CC

XE-135M = 6.60E-02 UCI/CC

AR-41 = 6.42E-02 UCI/CC

-----  
TOT GAS = 1.78E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*\*



1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $3.28E-01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $6.87E-01$  UCI/CC

3. DEGAS FACTORS

L.C.F. = .61609 D.F. = .56339 T.D.F. = .9145

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M =  $7.87E-02$  UCI/CC

KR-88 =  $1.13E-01$  UCI/CC

XE-133M =  $1.27E-02$  UCI/CC

XE-135 =  $4.32E-01$  UCI/CC

KR-87 =  $9.49E-02$  UCI/CC

XE-138 =  $5.29E-02$  UCI/CC

N-13 =  $3.52E-02$  UCI/CC

XE-135M =  $6.04E-02$  UCI/CC

AR-41 =  $5.87E-02$  UCI/CC

RC-GAS  
4-21-83  
#1

CD  
\*  
CD  
\*X OAIA CTRL: PGM: 7-D'

AUTOMATIC ISOTOPE ANALYSIS

4/21/83 52

SEQ: FILE NO: 73

GAS TKS: RM-057, RM 062, 4000CC, 1800 SEC

SPEC: FILE NO: ? LABEL ?

?

SUBTRACT BGND ?Y

COUNT BGND: ?Y

TYPE [CR] (OR LT) TO START ?

DATE SAMPLE WAS COLLECTED

MO: ?

CD

\*E F

AUTOMATIC ISOTOPE ANALYSIS

4/21/83 125

SEQ: FILE NO: 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL : 600 SEC

SPEC: FILE NO: ? LABEL ?

?RC GAS

SUBTRACT BGND ?N

DATE SAMPLE WAS COLLECTED

MO: 74

DAY 721

YEAR 71987

TIME 70208

SAMPLE VOL: OR WT: 71 ?CC

TYPE HEADING

RC GAS SAMPLE #1

TYPE [CR] (OR LT) TO START ?

SPEC: WRITTEN IN FILE 7 TAPE 27

RC GAS SAMPLE #1

4/21/83 231

SAMPLE COUNTING DATE 4/21/83 221

SAMPLE COLLECTION DATE 4/21/83 208

DECAY TIME 0 DAYS 13 MIN:

ACQ: LIVE TIME 10.0 MIN:

SAMPLE VOL: /WT: 1.00E+00 CC/GR

FWHM FILE NO: 1

ENG: CALIB: FILE 1 LAST CALIB: CHECK 4/20/83

EFF FILE NO: 3 5 CC VIAL

AIA PK: SRCH: 7-A'

RC-GAS  
4-21-83

#1

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	80.8	373202	58790	0.2	1.6
2	118.4	1291	37380	21.4	1.7
3	151.0	93731	31053	0.4	1.7
4	165.8	5410	21282	4.0	1.7
5	196.0	49081	21156	0.6	1.7
6	231.0	2035	24272	11.1	1.8
7	249.6	418211	14231	0.2	1.8
8	282.3	405	6647	28.9	1.9
9	304.8	8208	6864	1.8	1.9
10	329.0	259	6319	43.8	2.0
11	362.0	3017	5262	3.9	2.2
12	390.2	873	5298	12.3	2.3
13	396.0	3840	5122	3.1	2.3
14	402.3	26095	4946	0.7	2.3
15	408.7	2857	4769	3.9	2.3
16	413.0	1014	5160	10.5	2.3
17	434.3	7280	4195	1.7	2.3
18	455.4	622	3615	14.2	2.4
19	462.7	1366	3609	6.8	2.4
20	471.8	544	3875	16.7	2.4
21	499.1	182	4013	49.8	2.4
22	510.8	6017	3995	2.0	2.5
23	526.3	10151	3290	1.3	2.5
24	546.7	279	3354	30.0	2.5
25	607.9	4611	3231	2.3	2.6
26	619.9	223	3126	36.1	2.6
27	627.3	266	3083	30.2	2.6
28	673.7	632	2783	12.5	2.6
29	787.7	308	2042	21.5	2.4
30	812.6	150	2095	43.9	2.3
31	834.7	4828	2166	2.0	2.3
32	845.1	1588	2146	4.8	2.2
33	862.3	358	1962	18.3	2.2
34	870.7	216	1966	29.8	2.2
35	897.8	1286	1821	5.5	2.2
36	917.1	170	1801	36.1	2.1
37	985.6	271	2161	25.0	2.1
38	1009.3	701	1950	9.7	2.1
39	1074.4	164	2172	40.9	2.0
40	1114.2	165	1547	34.6	2.0
41	1141.1	508	1472	11.6	2.0
42	1174.2	441	1331	12.6	2.0
43	1179.7	356	1314	15.3	2.0
44	1184.9	211	1300	25.1	2.0
45	1211.1	189	1252	27.5	2.0
46	1243.9	108	1243	47.2	2.1
47	1250.7	335	1243	15.9	2.1
48	1293.3	9287	1498	1.2	2.2
49	1327.0	197	1152	25.4	2.2
50	1369.8	1209	1188	5.0	2.3
51	1435.5	1086	1065	5.2	2.3
52	1518.2	377	1220	14.1	2.3
53	1529.5	2139	1357	3.3	2.3
54	1625.4	101	957	44.5	2.4
55	1685.2	227	1080	21.5	2.4
56	1740.3	329	982	14.6	2.4

PC GAS  
421-83

#1

57	1747.9	1146	1239	5.3	2.4
58	1835.7	910	958	5.8	2.4
59	1850.7	114	916	38.7	2.4
60	1880.7	580	914	8.3	2.4

AIA ACT: CALC 7-D

# RC GASES

NUCLIDE	ENERGY	UUCI/CC	DECAY CORR. ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	81.0	6.87E-01 +/- 1.23E-03 6.87E-01	35.00	1.00 37319.97	0.2	0.2
KR-85M	149.5	7.87E-02 +/- 3.30E-04 7.87E-02	74.00	1.05 9369.99	0.4	-1.5
KR-88	196.1	1.13E-01 +/- 6.94E-04 1.13E-01	35.00	1.07 4908.02	0.6	0.0
XE-133M	232.8	1.27E-02 +/- 1.40E-03 1.27E-02	14.00	1.00 203.51	11.0	-0.2
XE-135	249.6	4.32E-01 +/- 6.49E-04 4.32E-01	92.00	1.02 41820.02	0.2	-0.0
KR-87	403.0	9.49E-02 +/- 6.83E-04 9.49E-02	50.00	1.17 2609.02	0.7	0.7
XE-138	434.4	5.29E-02 +/- 9.05E-04 5.29E-02	48.00	2.03 728.03	1.7	0.1
N-13	511.0	3.52E-02 +/- 6.90E-04 3.52E-02	123.00	3.30 601.73	2.0	0.2
XE-135M	527.0	6.04E-02 +/- 7.67E-04 6.04E-02	80.00	2.12 1015.03	1.3	0.7
AR-41	1293.6	5.87E-02 +/- 6.99E-04 5.87E-02	99.00	1.12 928.03	1.2	0.2

## UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
118.65	129.14	21.4
165.85	541.05	4.0
282.54	40.55	28.9
305.04	820.05	1.8
329.15	25.94	43.8
362.15	301.75	3.9
390.25	87.34	12.3
396.04	384.04	3.1
408.75	285.75	3.9
413.04	101.44	10.5
455.45	62.25	14.2
462.75	136.64	6.8

RC-GAS  
4-21-83

#1

471.84	54.44	16.7
499.14	18.25	49.8
546.75	27.94	30.0
607.95	461.14	2.3
619.95	22.34	36.1
627.35	26.64	30.2
673.75	63.25	12.5
787.75	30.84	21.5
812.65	15.04	43.9
834.75	482.84	2.0
845.15	158.84	4.8
862.35	35.84	18.3
870.75	21.64	29.8
897.85	128.64	5.5
917.15	17.04	36.1
985.65	27.14	25.0
1009.35	70.14	9.7
1074.55	16.34	40.9
1114.35	16.54	34.6
1141.25	50.75	11.6
1174.35	44.15	12.6
1179.85	35.65	15.3
1185.05	21.14	25.1
1211.25	18.94	27.5
1244.05	10.84	47.2
1250.85	33.55	15.8
1327.15	19.74	25.4
1369.95	120.94	5.0
1435.65	108.64	5.2
1518.45	37.75	14.1
1529.75	213.94	3.3
1625.65	10.14	44.5
1685.44	22.74	21.5
1740.65	32.95	14.5
1768.25	114.64	5.3
1836.05	91.05	5.8
1850.75	11.44	38.7
1880.75	59.05	8.3

RC-LIQ  
4-21-83

#1

CD

\*X OATA CTRL: PGM: 7-D'

AUTOMATIC ISOTOPE ANALYSIS

4/21/83 238

SEQ: FILE NO: 72

R/C: LIQUID ANALYSIS: 8 ML VIAL : 600 SEC : GAMMA ISOTOPIC

SPEC: FILE NO: ? LABEL ?

?RC LIQ

SUBTRACT BGND ?N

DATE SAMPLE WAS COLLECTED

MO: 74

DAY 721

YEAR 71983

TIME 70208

SAMPLE VOL:OR WT: 71 ?CC

TYPE HEADING

RC LIQ SAMPLE #1

TYPE [CR] (OR LT) TO START ?

SPEC: WRITTEN IN FILE 10 TAPE 27

RC LIQ SAMPLE #1

4/21/83 250

SAMPLE COUNTING DATE 4/21/83 238

SAMPLE COLLECTION DATE 4/21/83 208

DECAY TIME 0 DAYS 30 MIN:

ACC: LIVE TIME 10.0 MIN:

SAMPLE VOL./WT: 1.00E+00 CC/GR

FWHM FILE NO: 1

ENG: CALIB: FILE 1 LAST CALIB: CHECK 4/20/83

EFF FILE NO: 2 8 ML VIAL

AIA PK: SRCH: 7-A'

NO:	CENTROID	NET INTG:	BKGD:	% ERROR	FWHM
1	64.0	1043	55345	32.0	1.5
2	80.9	168564	58492	0.3	1.6
3	99.0	1271	50620	25.2	1.7
4	105.0	1843	51564	17.6	1.7
5	119.4	1528	45370	19.9	1.7
6	136.5	5917	45460	5.3	1.7
7	151.0	36037	40500	0.9	1.7
8	165.9	4134	37746	6.8	1.7
9	196.1	20194	42872	1.6	1.7
10	220.4	1939	35137	13.9	1.8
11	227.7	825	36750	33.0	1.8
12	234.4	1475	36189	18.4	1.8
13	249.7	204365	37092	0.3	1.8
14	283.6	1238	27655	19.2	1.9



RC-214  
4-21-83

#1

15	288.7	2771	27484	8.7	1.9
16	304.9	3112	26730	7.6	1.9
17	364.3	12435	23240	2.0	2.2
18	402.6	11370	19456	2.0	2.3
19	409.0	5406	17018	3.7	2.3
20	417.6	1902	18739	10.4	2.3
21	433.9	3533	19190	5.8	2.3
22	462.8	18097	17048	1.3	2.4
23	510.9	62361	18956	0.5	2.5
24	521.8	1198	21985	17.7	2.5
25	529.9	41628	18087	0.7	2.5
26	540.5	2141	13235	7.9	2.5
27	546.8	8348	14394	2.3	2.5
28	569.2	586	14196	29.1	2.6
29	595.3	2841	13465	6.1	2.6
30	606.4	4485	14945	4.1	2.6
31	621.7	3613	13192	4.8	2.6
32	629.9	3064	13220	5.6	2.6
33	637.1	736	13244	22.4	2.6
34	650.1	610	12963	26.7	2.6
35	657.0	1957	12636	8.4	2.6
36	661.4	3392	12449	5.0	2.6
37	667.8	17416	12123	1.2	2.6
38	677.4	2123	10511	7.2	2.5
39	707.1	1067	9715	13.4	2.5
40	728.0	1488	9474	9.6	2.5
41	766.0	1722	8884	8.1	2.4
42	772.6	10575	7982	1.5	2.4
43	795.8	1390	7753	9.4	2.3
44	811.7	977	7702	13.1	2.3
45	835.5	3773	7292	3.6	2.3
46	847.0	17956	6452	1.0	2.2
47	857.1	1085	7067	11.4	2.2
48	872.4	2463	6917	5.2	2.2
49	884.0	11495	5850	1.3	2.2
50	897.9	4334	5441	2.8	2.2
51	947.6	1185	5367	9.2	2.1
52	954.6	2000	5396	5.7	2.1
53	974.3	991	5460	11.0	2.1
54	1009.6	8530	5380	1.6	2.1
55	1031.8	1519	4718	6.9	2.1
56	1038.9	1987	4657	5.4	2.1
57	1052.8	334	4324	28.4	2.0
58	1072.5	2257	4752	4.8	2.0
59	1101.4	558	4660	17.8	2.0
60	1123.6	668	4241	14.3	2.0
61	1131.2	3961	4373	2.8	2.0
62	1136.6	1804	4486	5.8	2.0
63	1147.2	270	4216	34.6	2.0
64	1195.6	335	3962	27.1	2.0
65	1210.8	230	3850	38.7	2.0
66	1236.3	235	3695	37.2	2.1
67	1248.2	992	3591	9.1	2.1
68	1260.3	5131	3339	2.1	2.1
69	1293.4	3001	3424	3.3	2.2
70	1368.6	3118	2383	2.8	2.3
71	1398.6	550	2260	12.9	2.3
72	1435.6	13974	2617	1.0	2.3

RC-219  
4-21-83

#1

73	1443.9	319	2431	22.6	2.3
74	1457.4	1416	2164	5.4	2.3
75	1518.2	170	1960	37.6	2.3
76	1529.6	881	2010	7.9	2.3
77	1613.6	455	1707	13.7	2.4
78	1655.1	178	1351	30.2	2.4
79	1677.8	1361	1552	4.9	2.4
80	1685.3	111	1312	47.1	2.4
81	1706.3	703	1307	8.2	2.4
82	1731.5	470	1270	11.7	2.4
83	1741.1	302	1339	18.1	2.4
84	1767.9	320	1246	16.6	2.4
85	1791.0	938	1274	6.3	2.4
86	1806.5	517	1153	10.3	2.4
87	1835.8	3243	1343	2.4	2.4
88	1881.1	281	1081	17.6	2.4
89	1898.1	177	1181	28.5	2.5
90	1920.9	137	1563	41.7	3.9

AIA ACT. CALC 7-D

# RC IODINES

NUCLIDE	8 ML VIAL	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-131	2.39E-02 +/- 4.67E-04	1.00			
364.5	2.39E-02	82.00	1243.02	2.0	0.2
I-132	6.91E-02 +/- 3.90E-03	1.19			
954.6	6.91E-02	16.70	200.03	5.6	0.0
I-133	1.10E-01 +/- 7.37E-04	1.02			
529.9	1.10E-01	89.00	4162.04	0.7	0.0
975.5		4.40			
I-134	1.24E-01 +/- 1.63E-03	1.60			
884.1	1.24E-01	66.00	1149.03	1.3	0.1
I-135	9.87E-02 +/- 2.08E-03	1.06			
1260.5	9.87E-02	34.90	513.14	2.1	0.1
REG GUIDE	1.21				
XE-133	3.28E-01 +/- 1.01E-03	1.00			
81.0	3.28E-01	35.00	16830.01	0.3	0.1
CO-57	1.07E-03 +/- 2.14E-04	1.00			
121.9	1.07E-03	87.00	152.77	19.9	2.3
MO-99	***NOT IDENTIFIED***	1.00			
140.5	(< 5.58E-05)	360.01			
CE-141	***NOT IDENTIFIED***	1.00			
145.4	(< 4.59E-04)	48.00			
SN-117M	***NOT IDENTIFIED***	1.00			
158.4	(< 2.34E-04)	87.00			

RC-219  
4-21-83  
#1

XE-135	2.44E-01 +/- 6.12E-04	1.05			
249.6	2.44E-01 92.00	20430.01	0.3	-0.1	
CR-51 ***NOT IDENTIFIED***		1.00			
320.1 (< 3.33E-03)	9.80				
I-131 MAJOR PEAK MISSING		1.00			
344.5* 0.00E+00	82.00	0.05	---	0.2	
I-133 MAJOR PEAK MISSING		1.02			
529.9* 0.00E+00	89.00	0.05	---	0.0	
DA-140 ***NOT IDENTIFIED***		1.00			
537.3 (< 1.17E-03)	34.00				
REG GUIDE 1.21					
RU-103 ***NOT IDENTIFIED***		1.00			
497.1 (< 3.78E-04)	90.00				
CS-137 1.21E-02 +/- 5.99E-04	1.00				
661.6 1.21E-02 86.00	339.23	5.0	0.2		
ZR-95 ***NOT IDENTIFIED***		1.00			
754.7 (< 7.37E-04)	54.60				
NB-95 6.43E-03 +/- 5.20E-04	1.00				
745.8 6.43E-03 99.00	72.22	8.1	-0.1		
CS-134 6.13E-03 +/- 5.73E-04	1.00				
795.8 6.13E-03 88.00	139.03	9.3	0.0		
CO-58 3.93E-03 +/- 5.15E-04	1.00				
810.6 3.93E-03 99.00	97.74	13.1	-1.0		
MN-54 1.55E-02 +/- 5.59E-04	1.00				
834.8 1.55E-02 100.00	377.34	3.6	-0.6		
CS-136 ***NOT IDENTIFIED***		1.00			
1048.1 (< 5.72E-04)	80.50				
FE-59 5.50E-03 +/- 9.80E-04	1.00				
1099.3 5.50E-03 56.50	55.84	17.8	-2.1		
ZN-65 ***NOT IDENTIFIED***		1.00			
1115.4 (< 9.53E-04)	49.00				
REG GUIDE 1.21					
CO-60 ***NOT IDENTIFIED***		1.00			
1173.2 < 4.99E-04	100.00				
LA-140 ***NOT IDENTIFIED***		1.00			
1596.2 < 4.02E-04	96.50				
SD-124 ***NOT IDENTIFIED***		1.00			
1691.0 < 8.05E-04	45.70				

PC-21Q  
4-21-83  
#1

CS-138 1.75E-01 +/- 2.84E-03 2.14  
1008.4 1.75E-01 53.00 853.03 1.6 -1.1

UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
64.05	104.34	32.0
99.15	127.14	25.2
105.25	184.34	17.6
136.64	591.75	5.3
151.14	3603.04	0.9
165.94	413.44	6.8
196.25	2019.05	1.6
220.54	193.94	13.8
227.84	82.55	33.0
234.54	147.54	18.4
283.84	123.84	19.2
288.95	277.14	8.7
305.15	311.24	7.6
402.65	1137.05	2.0
409.04	540.65	3.7
417.64	190.24	10.4
433.95	353.34	5.8
462.84	1809.05	1.3
510.95	6236.04	0.5
521.85	119.84	17.7
540.55	214.14	7.9
546.85	834.05	2.3
569.25	58.65	29.0
595.35	284.14	6.1
606.45	448.54	4.1
621.75	361.34	4.8
629.95	306.44	5.6
637.15	73.64	22.4
650.15	61.05	26.7
657.05	195.74	8.4
667.85	1741.05	1.2
677.45	212.34	7.2
707.15	106.75	13.4
728.05	148.84	9.6
772.65	1057.05	1.5
847.05	1795.05	1.0
857.15	108.55	11.4
872.45	246.34	5.2
897.95	433.44	2.8
947.65	118.55	9.2
974.35	99.14	11.0
1031.85	151.94	6.9
1039.05	198.74	5.4
1052.95	33.45	28.4
1072.65	225.74	4.8
1123.75	66.85	14.3
1131.35	396.14	2.8
1136.75	180.44	5.8
1147.35	27.04	34.6
1195.75	33.55	27.1

PC-212  
4-21-83

#1

1210.95	23.04	38.7
1236.45	23.54	37.2
1248.35	99.25	9.1
1293.55	300.14	3.3
1368.75	311.84	2.8
1398.75	55.05	12.9
1435.75	1397.05	1.0
1444.05	31.94	22.6
1457.55	141.64	5.4
1518.45	17.04	37.6
1529.85	88.14	7.9
1613.85	45.55	13.7
1655.35	17.84	30.2
1678.05	136.14	4.9
1685.55	11.14	47.1
1706.55	70.35	8.2
1731.85	47.05	11.7
1741.44	30.24	18.1
1768.25	32.05	16.6
1791.35	93.84	6.3
1806.85	51.75	10.3
1836.15	324.34	2.4
1881.15	28.14	17.6
1898.15	17.75	28.5
1920.94	13.74	41.7

CHP-4.52-2  
FC-340  
R1 8-11-82  
1 OF 2

RL 79%

#2

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.21.1983

SAMPLE TIME 320

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 7.17E-01 UCI/CC

KR-85M = 8.49E-02 UCI/CC

KR-88 = 1.22E-01 UCI/CC

XE-133M = 1.84E-02 UCI/CC

XE-135 = 4.56E-01 UCI/CC

KR-87 = 9.82E-02 UCI/CC

XE-138 = 5.39E-02 UCI/CC

N-13 = 3.45E-02 UCI/CC

XE-135M = 6.33E-02 UCI/CC

AR-41 = 6.25E-02 UCI/CC

-----  
TOT GAS = 1.71E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*\*



CMP-4.52-3  
FC-340  
R1 8-11-82  
1 OF 2

1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $3.78\text{E-}01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $5.51\text{E-}01$  UCI/CC

3. DEGAS FACTORS

C.F. = .61609    D.F. = .47314    T.D.F. = .7680

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M =  $6.52\text{E-}02$  UCI/CC

KR-88 =  $9.34\text{E-}02$  UCI/CC

XE-133M =  $1.41\text{E-}02$  UCI/CC

XE-135 =  $3.50\text{E-}01$  UCI/CC

KR-87 =  $7.54\text{E-}02$  UCI/CC

XE-138 =  $4.14\text{E-}02$  UCI/CC

N-13 =  $2.65\text{E-}02$  UCI/CC

XE-135M =  $4.86\text{E-}02$  UCI/CC

AR-41 =  $4.80\text{E-}02$  UCI/CC

RC-GAS  
4-21-83  
#2

CD  
XX DATA CTRL. PRM1 7-D1

AUTOMATIC ISOTOPE ANALYSIS  
4/21/83 331  
SEQ. FILE NO. 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL : 600 SEC

SPEC. FILE NO. 7 LABEL 7  
RC GAS 2

SUBTRACT BOND 7M  
DATE SAMPLE WAS COLLECTED

MO. 74

DAY 721

YEAR 71-991-1983

TIME 0420

SAMPLE VOL./GR WT. 71 7CC

TYPE HEADING

RC GAS SAMPLE 211\

TYPE CORR (OR LT) TO START ?

SPEC. WRITTEN IN FILE 11 TAPE 27

RC GAS SAMPLE 2

4/21/83 342

SAMPLE COUNTING DATE 4/21/83 331

SAMPLE COLLECTION DATE 4/21/83 320

DECAY TIME 0 DAYS 11 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FWHM FILE NO. 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/20/83

EFF FILE NO. 3 5 CC VIAL

AIA PK. SRCH. 7-A

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	80.8	299716	46858	0.2	1.6
2	119.8	1477	29603	16.7	1.7
3	129.0	852	26766	27.4	1.7
4	151.0	77830	24305	0.5	1.7
5	165.9	613	20515	33.3	1.7
6	196.1	40528	16729	0.7	1.7
7	233.1	2266	18622	8.8	1.8
8	249.6	339420	16355	0.2	1.8
9	304.8	6720	5234	2.0	1.9
10	357.0	518	4183	18.2	2.1
11	362.1	2496	4042	4.1	2.2
12	371.0	200	3818	44.3	2.2
13	390.2	589	4272	16.2	2.3
14	396.1	2928	4126	3.6	2.3

RC-GAS  
4-21-83  
#2

15	402.4	20925	3979	0.8	2.3
16	409.8	2381	3973	4.4	2.3
17	414.4	6024	3290	1.9	2.3
18	455.3	363	3070	22.2	2.4
19	461.8	737	3000	11.2	2.4
20	471.8	263	3235	31.2	2.4
21	510.8	4972	3186	2.3	2.5
22	526.4	8656	2493	1.3	2.5
23	546.9	300	2653	35.7	2.5
24	572.9	172	2533	42.1	2.6
25	607.9	3820	2561	2.5	2.6
26	625.8	141	2400	49.9	2.6
27	636.1	177	2352	39.5	2.6
28	673.9	400	2176	17.2	2.6
29	788.2	118	1670	50.0	2.4
30	834.7	3943	1671	2.2	2.3
31	845.3	1349	1627	5.0	2.2
32	862.0	119	1450	46.2	2.2
33	871.2	129	1667	45.9	2.2
34	897.9	921	1421	6.7	2.2
35	936.3	150	1517	37.6	2.1
36	944.9	118	1355	45.1	2.1
37	985.6	366	1647	16.5	2.1
38	992.2	142	1489	39.3	2.1
39	1009.5	461	1698	13.5	2.1
40	1048.9	132	1539	42.9	2.0
41	1055.9	172	1495	32.5	2.0
42	1141.3	340	1170	15.2	2.0
43	1174.1	290	1076	17.6	2.0
44	1179.5	336	1060	14.7	2.0
45	1185.1	177	1046	26.9	2.0
46	1250.6	221	1136	22.6	2.1
47	1293.3	7651	1111	1.3	2.2
48	1369.8	1030	885	5.1	2.3
49	1382.3	93	868	46.0	2.3
50	1435.6	788	895	6.4	2.3
51	1518.5	261	985	18.1	2.3
52	1529.5	1741	1048	3.5	2.3
53	1603.3	120	828	35.1	2.4
54	1684.7	205	740	20.0	2.4
55	1705.8	85	753	47.0	2.4
56	1722.4	125	764	30.2	2.4
57	1740.6	155	819	27.3	2.4
58	1767.9	1042	1008	5.3	2.4
59	1835.7	599	856	8.0	2.4
60	1880.9	514	806	9.0	2.4

AIA ACT: CALC 7-D

RC GASES

NUCLIDE	UUCI/CC	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	5.51E-01 +/- 1.10E-03		1.00		
81.0	5.51E-01	35.00	29970.02	0.2	0.2
KR-85M	6.52E-02 +/- 2.93E-04		1.04		

RC-GAS  
4-2483  
#2

149.5	6.52E-02	74.00	7783.00	0.5	-1.5
KR-09	9.34E-02 +/- 4.24E-04		1.07		
174.1	9.34E-02	35.00	4051.98	0.7	-0.0
KL-123M	1.41E-02 +/- 1.24E-03		1.00		
232.9	1.41E-02	14.00	474.60	8.8	-0.2
KL-135	3.50E-01 +/- 5.94E-04		1.02		
249.4	3.50E-01	92.00	33940.01	0.2	-0.0
KR-07	7.54E-02 +/- 4.10E-04		1.14		
403.0	7.54E-02	50.00	3078.03	0.8	0.4
KL-138	4.14E-02 +/- 7.71E-04		1.92		
424.4	4.14E-02	40.00	602.44	1.8	0.0
N-12	2.45E-02 +/- 5.68E-04		3.01		
511.0	2.45E-02	123.00	477.23	2.1	0.2
KL-135M	4.86E-02 +/- 6.51E-04		2.00		
522.0	4.86E-02	80.00	845.03	1.3	0.4
AR-41	4.80E-02 +/- 6.20E-04		1.11		
1293.4	4.80E-02	92.00	745.14	1.3	0.2

# UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
120.05	147.74	16.7
129.25	85.25	27.4
165.94	41.34	33.3
305.04	672.05	2.0
357.15	51.84	18.2
362.25	249.64	4.1
371.04	20.04	44.3
390.25	58.94	16.2
396.15	292.84	3.6
408.84	228.14	4.4
455.34	36.34	22.2
462.84	73.75	11.1
471.84	26.34	31.2
546.95	20.84	35.7
572.25	17.25	42.1
607.95	382.84	2.5
625.85	14.14	49.9
636.15	17.75	39.5
673.25	40.05	17.2
708.25	11.84	50.0
834.75	394.34	2.2
845.35	134.94	5.0
862.05	11.94	46.2
871.25	12.84	45.9
897.95	92.14	6.7
936.35	15.04	37.6
944.95	11.84	45.1
985.65	36.65	16.5

RC-GAS  
4-21-83  
#2

992.25	14.24	39.3
1009.55	45.15	13.5
1049.05	13.24	42.9
1056.05	17.34	32.5
1141.45	34.05	15.2
1174.25	22.04	17.6
1179.55	33.65	14.7
1195.25	17.75	26.9
1250.75	22.14	22.6
1369.95	103.05	5.1
1382.45	9.34	46.0
1435.75	72.84	6.4
1510.75	26.14	18.1
1529.75	176.14	3.5
1602.55	12.04	35.1
1624.94	20.54	20.0
1706.05	8.54	47.0
1722.75	13.54	30.2
1740.94	15.54	27.3
1760.25	104.25	5.3
1836.05	59.84	8.0
1880.94	51.44	9.0

RC-LIQ  
4-21-83  
#2

CD

\*X DATA STRL: PGM: 7-B'

AUTOMATIC ISOTOPE ANALYSIS

4/21/83

347

SEC. FILE NO. 72

R.C. LIQUID ANALYSIS: 8 ML VIAL : 600 SEC : GAMMA ISOTOPIC

SPEC. FILE NO.: ? LABEL ?

TRC LIQ 2

SUBTRACT BGND ?N

DATE SAMPLE WAS COLLECTED

MO: 74

DAY 721

YEAR 71983

TIME 70320

SAMPLE VOL. OR WT. ?1 ?CC

TYPE HEADING

RC LIQ SAMPLE #2

TYPE CORR (OR LT) TO START ?

SPEC. WRITTEN IN FILE 12 TAPE 27

RC LIQ SAMPLE #2

4/21/83

339

SAMPLE COUNTING DATE 4/21/83 348

SAMPLE COLLECTION DATE 4/21/83 320

DECAY TIME 0 DAYS 29 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FMHM FILE NO. 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/20/83

EFF FILE NO. 2 8 ML VIAL

AIA PK. SRCH. 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FMHM
1	63.6	1267	70818	29.8	1.5
2	80.9	194171	64884	0.3	1.6
3	97.5	1095	46565	28.0	1.7
4	112.2	811	49415	38.9	1.7
5	136.6	6850	48043	4.7	1.7
6	151.0	42281	43667	0.9	1.7
7	165.8	3457	41607	8.5	1.7
8	196.1	22647	40029	1.4	1.7
9	220.2	2068	37511	13.4	1.8
10	227.7	596	39032	47.1	1.8
11	234.3	1550	38828	18.2	1.8
12	249.7	232875	40256	0.2	1.8
13	283.9	1566	28732	15.5	1.9
14	288.7	3653	28534	6.7	1.9



RC-L1Q  
421-83  
#2

15	304.9	4695	27634	5.2	1.9
16	316.4	1033	20693	23.9	2.1
17	364.2	11881	24926	2.1	2.2
18	396.0	931	20617	24.7	2.3
19	402.6	13055	20325	1.8	2.3
20	408.9	6574	20034	3.3	2.3
21	417.5	1774	19596	11.4	2.2
22	433.9	3290	20517	6.4	2.3
23	462.8	18782	17637	1.2	2.4
24	489.0	458	18873	42.7	2.4
25	510.9	65655	19900	0.5	2.5
26	521.9	1481	22988	14.7	2.5
27	529.9	43437	19151	0.7	2.5
28	540.5	2015	14145	0.6	2.5
29	546.8	8384	15095	2.3	2.5
30	564.1	931	14356	20.7	2.6
31	569.6	796	14537	21.7	2.6
32	595.2	2401	14526	7.4	2.6
33	606.9	4523	14463	4.0	2.6
34	621.6	3167	14375	5.6	2.6
35	629.9	3162	14135	5.6	2.6
36	636.9	649	13925	20.2	2.6
37	661.2	3160	13012	5.4	2.6
38	667.7	18199	12623	1.1	2.6
39	677.3	2734	12124	6.0	2.5
40	706.8	712	10613	20.8	2.5
41	727.6	1159	9201	12.1	2.5
42	766.2	1444	8364	9.3	2.4
43	772.6	11240	8332	1.3	2.4
44	793.9	1176	8233	11.3	2.3
45	811.9	958	8176	13.7	2.3
46	835.5	4146	7738	3.4	2.3
47	846.9	18751	6560	1.0	2.2
48	857.0	1216	6533	9.8	2.2
49	871.6	2128	7263	6.1	2.2
50	875.5	2559	7214	5.1	2.2
51	884.0	11946	6319	1.3	2.2
52	897.9	4579	5696	2.8	2.2
53	947.6	1001	5790	11.2	2.1
54	954.5	1958	5861	6.0	2.1
55	974.0	1272	4987	8.3	2.1
56	984.8	327	4945	30.9	2.1
57	1009.6	8823	5740	1.6	2.1
58	1031.8	2058	4881	5.3	2.1
59	1038.9	2425	4726	4.5	2.1
60	1072.5	2138	5073	5.2	2.0
61	1101.4	388	5011	26.3	2.0
62	1123.9	668	4383	14.5	2.0
63	1131.3	4262	4499	2.7	2.0
64	1136.6	2184	4580	4.9	2.0
65	1195.8	220	4143	41.9	2.0
66	1235.8	282	3388	29.8	2.1
67	1241.1	217	3365	38.4	2.1
68	1248.2	1029	3334	8.5	2.1
69	1260.3	5328	3494	2.1	2.1
70	1293.4	3609	3634	2.9	2.2
71	1368.7	3500	2416	2.6	2.3
72	1398.5	597	2376	12.3	2.3

RC-L18  
4-21-83  
#2

73	1415.7	193	2439	35.9	2.3
74	1435.6	14440	2994	1.0	2.3
75	1457.3	1562	2224	5.0	2.3
76	1503.5	274	2076	24.3	2.3
77	1529.7	994	2176	7.3	2.3
78	1566.0	144	1933	47.2	2.3
79	1613.5	509	1828	12.7	2.4
80	1677.9	1312	1748	5.3	2.4
81	1706.2	581	1471	10.2	2.4
82	1731.3	524	1365	10.9	2.4
83	1741.3	367	1309	14.9	2.4
84	1767.8	379	1431	15.1	2.4
85	1791.1	1157	1271	5.3	2.4
86	1806.4	615	1212	9.0	2.4
87	1835.7	3476	1341	2.3	2.4
88	1880.4	250	1092	19.7	2.4
89	1897.7	242	1201	21.3	2.5

AIA ACT: CALC 7-D

# RC IODINES

NUCLIDE ENRGY	B ML VIAL	DECAY COR.	ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-131 364.5	2.29E-02 +/- 4.78E-04 2.29E-02	1.00	82.00	1188.05	2.1	0.3
I-132 954.6	6.68E-02 +/- 3.99E-03 6.68E-02	1.18	16.70	195.83	6.0	0.1
I-133 529.7 875.5	1.14E-01 +/- 7.45E-04 1.14E-01 OVERLAP	1.02	89.00 4.40	4343.02 112.30	0.6 5.1	0.1 0.0
I-134 894.1	1.24E-01 +/- 1.63E-03 1.24E-01	1.55	66.00	1194.03	1.3	0.1
I-135 1260.5	1.02E-01 +/- 2.12E-03 1.02E-01	1.06	34.90	533.84	2.1	0.1

## REG GUIDE 1.21

XL-133 91.0	3.78E-01 +/- 1.09E-03 3.78E-01	1.00	35.00	19409.99	0.3	0.1
CD-57 121.9	***NOT IDENTIFIED*** ( $< 2.93E-04$ )	1.00	87.00			
MO-99 140.5	***NOT IDENTIFIED*** ( $< 8.08E-05$ )	1.00	360.01			
CE-141 145.4	***NOT IDENTIFIED*** ( $< 6.18E-04$ )	1.00	48.00			
SN-117M 158.4	***NOT IDENTIFIED*** ( $< 3.45E-04$ )	1.00	87.00			

RC-L1Q  
421-83  
#2

KB-125	2.79E-01 +/- 6.67E-04	1.00			
349.4	2.79E-01	92.00	2.32E+04	0.2	-0.1
LN-51 ***NOT IDENTIFIED***		1.00			
320.1	(< 4.04E-03)	9.80			
I-131 MAJOR PEAK MISSING		1.00			
344.5*	0.00E+00	82.00	0.05	---	0.3
I-132 MAJOR PEAK MISSING		1.02			
529.7*	0.00E+00	89.00	0.05	---	0.1
KA-140 ***NOT IDENTIFIED***		1.00			
527.3	(< 2.08E-03)	34.00			
REG GUIDE 1.21					
RU-103 ***NOT IDENTIFIED***		1.00			
497.1	(< 5.18E-04)	90.00			
CS-137	1.12E-02 +/- 6.03E-04	1.00			
661.6	1.12E-02	86.00	316.03	5.4	0.4
ZR-95 ***NOT IDENTIFIED***		1.00			
756.7	(< 1.00E-03)	54.60			
NB-95	5.39E-03 +/- 5.03E-04	1.00			
765.8	5.39E-03	99.00	44.42	9.3	-0.3
CS-134	5.19E-03 +/- 5.86E-04	1.00			
795.8	5.19E-03	89.00	117.63	11.3	-0.0
CO-58	3.85E-03 +/- 5.29E-04	1.00			
910.6	3.85E-03	99.00	95.84	13.7	-1.2
MN-54	1.71E-02 +/- 5.77E-04	1.00			
934.8	1.71E-02	100.00	414.63	3.4	-0.6
CS-136 ***NOT IDENTIFIED***		1.00			
1048.1	(< 8.32E-04)	80.50			
PE-59	3.82E-03 +/- 1.00E-03	1.00			
1099.3	3.82E-03	56.50	38.84	26.3	-2.1
ZN-45 ***NOT IDENTIFIED***		1.00			
1115.4	(< 1.30E-03)	49.00			
REG GUIDE 1.21					
CO-40 ***NOT IDENTIFIED***		1.00			
1173.2	(< 6.56E-04)	100.00			
LA-140 ***NOT IDENTIFIED***		1.00			
1596.2	< 5.44E-04	96.50			
SD-124 ***NOT IDENTIFIED***		1.00			
1691.0	(< 1.12E-03)	45.70			

RC-L19  
4-21-83  
#2

CS-138 1.71E-01 +/- 2.76E-03 2.02  
1008.4 1.71E-01 53.00 892.03 1.6 -1.1

UNIDENTIFIED PHOTOPeAKS

ENERGY	RATE(CPM)	% ERR
43.65	126.75	29.8
97.65	109.55	28.0
112.44	81.14	38.9
136.75	685.05	4.7
151.14	4228.04	0.8
165.95	345.74	8.5
196.25	2264.04	1.4
220.74	206.84	13.4
227.84	59.65	43.1
234.44	155.04	18.2
284.15	156.64	18.5
288.95	365.34	6.7
305.15	469.84	5.2
336.54	107.34	23.8
396.04	83.14	24.7
402.65	1305.05	1.8
408.95	657.44	3.3
417.54	177.44	11.4
433.95	328.04	6.4
462.84	1878.05	1.2
489.04	45.84	42.7
510.95	6565.04	0.5
521.95	148.14	14.7
540.55	201.54	8.6
546.95	838.05	2.3
564.15	83.14	20.7
569.65	79.64	21.7
595.25	240.14	7.4
606.95	452.34	4.0
621.65	316.74	5.6
629.95	316.24	5.6
636.95	66.94	25.2
667.75	1839.05	1.1
677.35	273.44	6.0
706.85	71.25	20.8
727.65	115.94	12.1
772.65	1124.05	1.5
846.95	1875.05	1.0
857.05	121.64	9.8
871.65	212.84	6.1
897.95	457.84	2.8
947.65	100.14	11.2
974.05	127.25	8.3
984.85	32.75	30.9
1031.85	205.84	5.3
1039.05	242.54	4.5
1072.65	213.84	5.2
1124.05	66.94	14.5
1131.45	426.24	2.7
1136.75	218.44	4.9
1195.95	22.04	41.9

KC-L18  
4-21-83  
#2

1235.95	28.24	29.2
1241.25	21.74	38.4
1248.75	102.94	0.5
1292.55	360.94	2.9
1360.05	350.04	2.6
1390.65	59.75	12.2
1415.05	19.34	36.9
1425.75	1444.05	1.0
1457.45	156.14	5.0
1503.75	27.44	24.3
1529.95	99.64	7.3
1564.25	13.44	47.2
1612.75	50.94	12.7
1670.15	131.14	5.3
1706.44	59.15	10.2
1731.65	52.44	10.9
1741.65	36.75	14.9
1769.15	37.84	15.1
1791.44	115.75	5.3
1806.75	61.55	9.0
1836.05	347.64	2.3
1880.44	25.04	19.7
1897.75	24.24	21.2

EMP-4 52-2  
FC-340  
R1 B-11-82  
1 OF 2

Rx  
87%  
#3

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.22.1983

SAMPLE TIME 1913

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 7.60E-01 UCI/CC

KR-85M = 9.92E-02 UCI/CC

KR-88 = 1.41E-01 UCI/CC

XE-133M = 1.43E-02 UCI/CC

XE-135 = 4.85E-01 UCI/CC

KR-87 = 1.14E-01 UCI/CC

XE-138 = 5.54E-02 UCI/CC

N-13 = 2.98E-02 UCI/CC

XE-135M = 5.96E-02 UCI/CC

AR-41 = 6.57E-02 UCI/CC

-----  
TOT GAS = 1.82E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*



CMP-4.52-3  
FC-340  
R1 8-11-82  
1 OF 2

1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $4.22\text{E-}01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $5.48\text{E-}01$  UCI/CC

3. DEGAS FACTORS

C.F. = .61609    D.F. = .44446    T.D.F. = .7214

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M =  $7.16\text{E-}02$  UCI/CC

KR-88 =  $1.02\text{E-}01$  UCI/CC

XE-133M =  $1.03\text{E-}02$  UCI/CC

XE-135 =  $3.50\text{E-}01$  UCI/CC

KR-87 =  $8.25\text{E-}02$  UCI/CC

XE-138 =  $4.00\text{E-}02$  UCI/CC

N-13 =  $2.15\text{E-}02$  UCI/CC

XE-135M =  $4.30\text{E-}02$  UCI/CC

AR-41 =  $4.74\text{E-}02$  UCI/CC

RC GAS  
(SAMPLE #1)  
4/22/83

Dastevens

DATA CTRL. MEM. 7-D

AUTOMATIC ISOTOPE ANALYSIS

4/22/83 1919

SEQ. FILE NO. 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL 1 400 SEC

SPEC. FILE NO. ? LABEL ?

RC GAS

SUBTRACT BOND ?M

DATE SAMPLE WAS COLLECTED

MO. 74

DAY 722

YEAR 71983

TIME 71913

SAMPLE VOL. OR WT. 71 7CC

TYPE HEADING

RC GAS

TYPE ECRI (OR LT) TO START ?

SPEC. WRITTEN IN FILE 4 TAPE 20

RC GAS

4/22/83 1930

SAMPLE COUNTING DATE 4/22/83 1920

SAMPLE COLLECTION DATE 4/22/83 1913

DECAY TIME 0 DAYS 7 MIN.

ACC. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FWHM FILE NO. 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/22/83

EFF FILE NO. 3 5 CC VIAL

AIA PK. GRCH. 7-A

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	80.7	317016	50355	0.2	1.6
2	118.9	1997	36257	13.7	1.7
3	129.1	535	29305	45.5	1.7
4	150.9	86739	27213	0.4	1.7
5	165.8	5020	18716	4.1	1.7
6	196.0	45201	18660	0.6	1.7
7	233.0	1660	20909	12.6	1.8
8	242.2	8346	18249	2.5	1.8
9	249.5	342391	12288	0.2	1.8
10	304.7	7618	4041	1.8	1.9
11	334.8	350	5282	29.9	2.1
12	340.1	287	5072	35.6	2.1
13	349.4	255	5452	41.4	2.1

RC GAS

(SAMPLE #1)

4/22/83

D. Stevens

14	357.0	650	4708	15.4	2.1
15	362.0	2700	4610	4.0	2.2
16	390.2	649	4758	15.5	2.4
17	395.0	3130	4103	3.4	2.4
18	402.3	23961	4447	0.8	2.3
19	408.6	2344	4292	4.8	2.3
20	414.4	7032	3695	1.7	2.3
21	453.2	849	3306	10.2	2.6
22	462.6	1602	3275	5.6	2.4
23	471.6	400	3236	20.7	2.4
24	499.0	184	3176	47.2	2.4
25	510.7	5562	3740	2.1	2.5
26	526.4	9412	2950	1.3	2.5
27	546.7	362	3028	22.1	2.6
28	570.8	187	2971	41.6	2.6
29	607.9	3801	2920	2.6	2.6
30	673.7	554	2598	13.7	2.6
31	681.4	159	2291	43.6	2.5
32	788.1	181	1989	35.6	2.4
33	813.5	198	1881	31.8	2.3
34	834.6	4556	1951	2.0	2.3
35	845.1	1312	2032	5.6	2.2
36	861.9	269	1613	22.0	2.2
37	870.4	199	1829	31.2	2.2
38	897.8	1309	1662	5.2	2.2
39	918.1	148	1608	39.2	2.1
40	945.5	272	1744	22.5	2.1
41	964.7	123	1595	46.8	2.1
42	985.5	338	1863	18.9	2.1
43	1009.3	650	1960	10.4	2.1
44	1030.9	182	1742	33.3	2.1
45	1113.9	264	1372	20.8	2.0
46	1141.0	331	1355	16.7	2.0
47	1173.9	391	1266	13.8	2.0
48	1179.4	385	1266	14.0	2.0
49	1185.1	147	1266	35.2	2.0
50	1209.6	124	1208	40.6	2.0
51	1250.4	271	1354	20.1	2.1
52	1293.2	7780	1386	1.3	2.2
53	1304.7	114	1149	43.1	2.2
54	1324.9	109	1069	43.3	2.2
55	1336.9	114	1069	41.6	2.3
56	1369.6	995	1153	5.8	2.3
57	1435.4	1169	1105	5.0	2.3
58	1475.6	96	949	46.5	2.3
59	1518.1	399	1129	12.9	2.3
60	1529.5	1984	1210	3.3	2.3
61	1615.1	93	964	48.4	2.4
62	1684.7	281	934	16.5	2.4
63	1740.2	220	1004	21.5	2.4
64	1767.7	1192	959	4.7	2.4
65	1835.6	913	895	5.7	2.4
66	1880.6	463	860	10.1	2.4

ATA ACT. CALC 7-D

RC GASES

RC GAS (SAMPLE #1)  
4/22/83 Wastevans

NUCLIDE ENERGY	NUCL/CC	DECAY CORR. ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
KE-133 81.0	5.84E-01 +/- 1.16E-03 5.84E-01	35.00	1.00 31700.02	0.2	0.3
KR-83M 140.5	7.14E-02 +/- 3.08E-04 7.14E-02	74.00	1.03 2470.02	0.4	-1.3
KR-83 196.1	1.02E-01 +/- 4.43E-04 1.02E-01	35.00	1.05 4520.00	0.6	0.2
KE-133M 222.8	1.03E-02 +/- 1.30E-03 1.03E-02	14.00	1.00 166.02	12.4	-0.1
KE-133 249.4	3.50E-01 +/- 5.84E-04 3.50E-01	92.00	1.01 34330.04	0.2	0.1
KR-87 403.0	8.25E-02 +/- 6.18E-04 8.25E-02	50.00	1.11 2376.02	0.7	0.2
KE-133 434.4	4.00E-02 +/- 6.81E-04 4.00E-02	48.00	1.57 703.84	1.7	0.2
K-137 511.0	2.15E-02 +/- 4.41E-04 2.15E-02	123.00	2.12 556.84	2.1	0.4
KE-133M 527.0	4.30E-02 +/- 5.63E-04 4.30E-02	80.00	1.63 941.03	1.3	0.2
OR-41 1293.6	4.74E-02 +/- 6.25E-04 4.74E-02	99.00	1.07 770.03	1.3	0.3

UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
119.05	199.74	13.7
129.25	53.55	45.5
165.75	502.04	4.1
242.25	834.05	2.5
304.75	761.84	1.8
434.84	35.05	29.8
340.04	28.74	35.6
349.34	25.54	41.4
356.95	65.05	15.4
361.95	270.04	4.0
390.15	64.94	15.5
395.95	313.04	3.4
408.54	274.44	4.5
455.14	84.94	10.2
462.54	160.14	5.6
471.54	40.05	20.7
498.95	18.44	47.2
546.65	36.25	22.1
570.75	18.75	41.6
607.85	380.14	2.6
673.65	55.44	13.7

RC 6A5  
(SAMPLE #1)

4/22/83

*J. Stevens*

691.25	1.8	3.4	4.4
798.15	1.0	1.8	3.8
813.45	1.0	3.4	3.4
844.45	4.8	3.4	3.4
845.15	1.4	1.8	3.4
851.05	3.4	3.4	3.4
870.65	1.0	3.4	3.4
897.05	1.0	3.4	3.4
919.15	1.4	3.4	3.4
945.85	3.4	3.4	3.4
944.75	3.4	3.4	3.4
955.85	3.4	3.4	3.4
1009.35	6.8	3.4	3.4
1010.35	1.0	3.4	3.4
1114.05	3.4	3.4	3.4
1141.15	3.4	1.8	3.4
1174.05	3.4	1.8	3.4
1179.65	3.4	3.4	3.4
1185.05	1.4	3.4	3.4
1209.75	1.0	3.4	3.4
1250.85	2.7	1.4	3.4
1304.05	1.1	3.4	3.4
1325.05	1.0	3.4	3.4
1337.05	1.1	3.4	3.4
1369.35	9.9	3.4	3.4
1435.85	11.6	3.4	3.4
1475.85	9.9	3.4	3.4
1519.35	3.9	3.4	3.4
1529.75	198	3.4	3.4
1615.35	9.74	3.4	3.4
1684.94	28	1.4	3.4
1740.55	22	0.4	3.4
1768.05	119	2.5	3.4
1835.94	91	3.4	3.4
1890.65	46	2.5	3.4



RC LIQUID  
(SAMPLE #1)

4/22/83

*D. Stevens*

00  
XX DATA CTRL. REM. 7-D'

AUTOMATIC ISOTOPE ANALYSIS  
4/22/83 1943

SEQ. FILE NO. 72

R.C. LIQUID ANALYSIS: 8 ML VIAL : 600 SEC : GAMMA ISOTOPIC

SPEC. FILE NO. ? LABEL ?

TRC LIQ

SUBTRACT BOND ?N

DATE SAMPLE WAS COLLECTED

MO. 74

DAY 722

YEAR 71983

TIME 71913

SAMPLE VOL. OR WT. ?1 TCC

TYPE HEADING

RC LIQ

TYPE (CR) (OR LT) TO START ?

SPEC. WRITTEN IN FILE 4 TAPE 20

RC LIQ

4/22/83 1955

SAMPLE COUNTING DATE 4/22/83 1944

SAMPLE COLLECTION DATE 4/22/83 1913

DECAY TIME 0 DAYS 31 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FMMH FILE NO. 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/22/83

EFF FILE NO. 2 8 ML VIAL

AIA PK. SRCH. 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FMMH
1	63.7	950	72753	40.3	1.5
2	80.8	216357	65488	0.3	1.6
3	119.8	1097	48809	28.6	1.7
4	136.6	5864	48410	5.5	1.7
5	151.0	45837	49784	0.8	1.7
6	165.8	5191	40094	5.6	1.7
7	174.5	911	39156	30.9	1.7
8	196.0	24644	45124	1.4	1.7
9	220.2	2151	37264	12.9	1.8
10	234.2	1641	38634	17.1	1.8
11	249.6	239076	35163	0.2	1.8
12	283.4	1429	24584	15.7	1.9
13	288.4	3390	24434	6.7	1.9
14	304.9	4885	26993	5.0	1.9



RC Liquid  
(SAMPLE #1)

4/22/83

Dastevens

15	319.7	457	26339	35.2	2.0
16	425.3	1019	26044	22.6	2.0
17	429.1	1403	25807	16.4	2.0
18	434.5	1495	28535	16.2	2.1
19	444.2	11390	24115	2.1	2.1
20	490.5	538	20364	37.8	2.3
21	494.0	872	17921	22.0	2.3
22	402.5	14024	19917	1.7	2.3
23	408.9	4011	19693	3.5	2.3
24	417.5	1810	19355	11.1	2.3
25	433.7	3673	17828	5.4	2.3
26	462.7	17520	17271	1.3	2.4
27	471.6	526	16987	35.3	2.4
28	488.5	469	16452	39.0	2.4
29	510.8	60877	19568	0.3	2.5
30	521.0	2654	22127	8.2	2.5
31	529.8	43874	18529	0.7	2.5
32	540.4	2543	11568	6.8	2.5
33	544.8	8252	14789	2.4	2.5
34	584.1	563	14399	30.4	2.5
35	589.5	685	12947	23.8	2.5
36	595.1	2061	14521	8.6	2.5
37	606.7	4491	14239	4.0	2.5
38	621.6	3462	13564	5.1	2.5
39	629.9	3361	13639	5.2	2.5
40	637.1	519	13705	32.2	2.5
41	661.3	3041	12896	5.6	2.5
42	667.7	18559	12612	1.1	2.5
43	677.2	2414	12247	6.8	2.5
44	706.8	761	10033	19.0	2.5
45	727.1	1529	9726	9.5	2.5
46	766.2	1297	8123	10.2	2.4
47	772.5	11686	8069	1.4	2.4
48	795.7	1595	7809	8.2	2.2
49	812.1	1733	7240	7.3	2.2
50	835.4	4021	7453	3.4	2.2
51	846.9	18507	6342	1.0	2.2
52	856.9	1306	6154	8.9	2.2
53	871.4	2293	6836	5.5	2.2
54	875.6	2770	6813	4.6	2.2
55	883.9	11697	6010	1.3	2.2
56	897.9	4508	5430	2.8	2.2
57	947.5	1047	5594	10.6	2.1
58	954.5	2180	5583	5.3	2.1
59	973.6	1104	5546	10.0	2.1
60	1009.5	8185	5410	1.7	2.1
61	1031.8	1444	4726	7.2	2.1
62	1038.8	2222	4700	4.9	2.1
63	1052.7	265	4342	35.7	2.0
64	1072.4	2030	4993	5.4	2.0
65	1101.2	578	4064	16.1	2.0
66	1123.7	757	4102	12.5	2.0
67	1131.2	4711	4008	2.4	2.0
68	1136.6	2339	3927	4.3	2.0
69	1142.0	634	3860	14.4	2.0
70	1147.6	624	3780	14.5	2.0
71	1195.5	287	4375	33.1	2.0
72	1248.1	777	3334	11.1	2.1

RC LIQUID  
(SAMPLE #1)

4/22/83

Dastevens

73	1260.2	5539	3086	2.0	2.1
74	1293.4	5324	3424	3.0	2.2
75	1343.5	302	2345	21.3	2.3
76	1368.7	2589	2407	3.4	2.3
77	1382.6	233	2247	29.5	2.3
78	1393.6	361	2217	10.9	2.3
79	1435.5	13374	2856	1.0	2.4
80	1457.2	1573	2156	4.9	2.3
81	1449.7	135	2049	48.2	2.3
82	1529.7	1045	2024	6.7	2.3
83	1613.9	382	1843	16.7	2.4
84	1677.9	1541	1445	4.3	2.4
85	1704.2	947	1271	6.9	2.4
86	1731.2	354	1270	15.0	2.4
87	1741.0	414	1414	13.8	2.4
88	1748.0	204	1405	26.7	2.4
89	1790.9	1147	1271	5.2	2.4
90	1804.1	553	1311	10.2	2.4
91	1835.4	3379	1213	2.3	2.4
92	1880.8	301	1177	17.1	2.4
93	1897.6	227	1042	21.2	2.5
94	1924.5	224	1739	27.2	4.2

MAIA ACT. CALC 7-D

RC IODINES

NUCLIDE	8 ML VIAL	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-131	2.19E-02 +/- 4.70E-04	1.00			
364.5	2.19E-02	82.00	1139.03	2.1	0.4
I-132	7.55E-02 +/- 3.99E-03	1.20			
954.6	7.55E-02	16.70	219.03	5.3	0.1
I-133	1.13E-01 +/- 7.36E-04	1.02			
529.9	1.13E-01	89.00	4287.04	0.6	0.2
975.5	OVERLAP	4.40	110.86	4.6	-0.0
I-134	1.27E-01 +/- 1.66E-03	1.61			
984.1	1.27E-01	66.00	1169.03	1.3	0.2
I-135	1.06E-01 +/- 2.08E-03	1.06			
1260.5	1.06E-01	34.90	553.94	2.0	0.2

REG GUIDE 1.21

XE-133	4.22E-01 +/- 1.14E-03	1.00			
81.0	4.22E-01	35.00	21629.99	0.3	0.2
CO-57	7.74E-04 +/- 2.21E-04	1.00			
121.9	7.74E-04	87.00	109.71	28.6	2.0
MO-99	***NOT IDENTIFIED***	1.00			
140.5	(4.633E-05)	360.01			
CE-141	***NOT IDENTIFIED***	1.00			

RC LIQUID  
(SAMPLE #1)

4/22/83

*D. Stevens*

145.4	( $5.43E-04$ )	48.00			
SN-117 ***NOT IDENTIFIED***			1.00		
159.4	( $3.07E-04$ )	97.00			
XE-135	$2.84E-01 \pm 6.59E-04$		1.05		
249.4	$2.84E-01$	92.00		23900.02	0.2 0.0
UN-51	$9.17E-03 \pm 3.22E-03$		1.00		
320.1	$9.17E-03$	9.80		45.71	33.2 0.4
1-131 MAJOR PEAK MISSING			1.00		
244.5*	$0.00E+00$	82.00		0.05	--- 0.4
1-133 MAJOR PEAK MISSING			1.02		
529.9*	$0.00E+00$	87.00		0.05	--- 0.2
SA-140 ***NOT IDENTIFIED***			1.00		
537.3	( $1.75E-03$ )	34.00			
REG GUIDE 1.21					
GU-103 ***NOT IDENTIFIED***			1.00		
497.1	( $4.27E-04$ )	90.00			
CU-137	$1.08E-02 \pm 6.05E-04$		1.00		
441.4	$1.08E-02$	84.00		304.14	5.6 0.4
ER-95 ***NOT IDENTIFIED***			1.00		
756.7	( $8.16E-04$ )	54.60			
NP-95	$4.84E-03 \pm 4.94E-04$		1.00		
765.8	$4.84E-03$	99.00		129.74	10.2 -0.2
CU-134	$7.04E-03 \pm 5.78E-04$		1.00		
795.8	$7.04E-03$	88.00		159.53	9.2 0.1
CU-58	$6.98E-03 \pm 5.12E-04$		1.00		
810.4	$6.98E-03$	99.00		173.33	7.3 -1.4
LMN-54	$1.66E-02 \pm 5.68E-04$		1.00		
834.8	$1.66E-02$	100.00		402.13	3.4 -0.5
CS-136 ***NOT IDENTIFIED***			1.00		
1048.1	( $6.53E-04$ )	80.50			
FE-59	$5.70E-03 \pm 9.20E-04$		1.00		
1099.3	$5.70E-03$	56.50		57.84	16.1 -1.9
ZN-65 ***NOT IDENTIFIED***			1.00		
1115.4	( $1.05E-03$ )	49.00			
REG GUIDE 1.21					
CO-60 ***NOT IDENTIFIED***			1.00		
1173.2	( $5.53E-04$ )	100.00			
LA-140 ***NOT IDENTIFIED***			1.00		

RC LIQUID

(SAMPLE #1)

9/22/83

Dastevens

1596.2 < 4.54E-04 96.50

SP-124 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1691.0 (< 9.21E-04) 45.70

LS 122 1.70E-01 +/- 2.85E-03 2.16  
1008.4 1.70E-01 53.00 818.03 1.7 -1.0

# UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
63.75	95.05	40.3
126.64	586.45	5.5
151.04	4583.04	0.8
165.75	519.15	5.6
174.44	91.14	30.9
195.94	2464.04	1.4
220.14	215.14	12.0
234.25	164.14	17.1
283.45	142.94	15.7
288.45	339.04	6.7
304.95	488.54	5.0
325.74	101.94	22.6
329.15	140.34	16.4
336.45	149.54	16.2
390.45	53.04	37.8
395.95	87.25	23.0
402.45	1402.05	1.7
408.04	601.15	3.5
417.45	181.84	11.1
433.64	367.34	5.4
462.64	1752.05	1.3
471.54	52.65	35.3
488.45	46.94	39.0
510.75	6087.04	0.5
521.75	265.44	8.2
540.35	254.34	6.8
546.75	826.05	2.4
564.05	56.34	30.4
569.45	68.55	23.8
595.05	206.14	8.6
606.65	449.14	4.0
621.55	346.24	5.1
629.85	336.14	5.2
637.05	51.94	32.2
667.65	1855.05	1.1
677.15	241.44	6.8
706.75	76.14	19.0
727.05	152.94	9.5
772.45	1168.05	1.4
846.95	1850.05	1.0
856.95	130.64	8.9
871.45	229.34	5.5
897.95	450.84	2.8
947.55	104.75	10.6
973.65	110.44	10.0
1031.85	144.44	7.2

RC LIQUID  
(SAMPLE #1)

4/22/83

D. Stevens

1030.95	222.24	4.9
1052.05	26.54	35.7
1072.55	203.04	5.4
1122.85	75.75	12.5
1131.35	471.14	2.4
1136.75	233.94	4.3
1142.15	63.44	14.4
1147.75	62.44	14.5
1195.45	28.74	33.1
1249.25	77.75	11.1
1293.55	333.44	3.0
1343.45	30.24	27.5
1348.85	255.94	3.4
1392.75	27.34	29.5
1399.75	66.14	10.8
1435.65	1337.05	1.0
1457.35	157.34	4.9
1460.55	13.54	48.2
1520.95	106.55	6.7
1614.05	38.25	16.7
1670.05	154.14	4.3
1706.44	84.75	6.9
1731.55	35.45	15.2
1741.35	41.44	13.7
1748.35	20.64	26.7
1791.25	116.75	5.2
1806.44	55.34	10.2
1835.94	337.94	2.3
1880.85	30.14	17.1
1897.65	22.74	21.2
1926.55	22.44	27.2



CMP-4,52-2  
FC-340  
R1 5-11-82  
1 OF 2

Rx  
89%

#4

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4,22,1983

SAMPLE TIME 2011

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 7.97E-01 UCI/CC

KR-85M = 9.68E-02 UCI/CC

KR-88 = 1.40E-01 UCI/CC

XE-133M = 1.48E-02 UCI/CC

XE-135 = 4.78E-01 UCI/CC

KR-87 = 1.13E-01 UCI/CC

XE-138 = 5.09E-02 UCI/CC

N-13 = 3.44E-02 UCI/CC

XE-135M = 6.06E-02 UCI/CC

AR-41 = 6.25E-02 UCI/CC

---

TOT GAS = 1.85E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*



CMP-4.52-3  
FC-340  
R1 8-11-82  
1 OF 2

1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $3.40E-01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $7.42E-01$  UCI/CC

3. DEGAS FACTORS

C.F. = .61609 D.F. = .57347 T.D.F. = .9308

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M =  $9.01E-02$  UCI/CC

KR-88 =  $1.30E-01$  UCI/CC

XE-133M =  $1.38E-02$  UCI/CC

XE-135 =  $4.45E-01$  UCI/CC

KR-87 =  $1.05E-01$  UCI/CC

XE-138 =  $4.74E-02$  UCI/CC

N-13 =  $3.20E-02$  UCI/CC

XE-135M =  $5.64E-02$  UCI/CC

AR-41 =  $5.82E-02$  UCI/CC

RC GAS  
(SAMPLE #2)

4/22/83

Dastevens

TX DATA CTRL: PGM: 7-D'

AUTOMATIC ISOTOPE ANALYSIS  
4/22/83 2021

SEQ: FILE NO. ?1

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL : 600 SEC  
SPEC: FILE NO. ? LABEL ?  
TRC GAS  
SUBTRACT BOND IN  
DATE SAMPLE WAS COLLECTED

MO: ?4  
DAY: ?22  
YEAR: ?1983  
TIME: ?2011  
SAMPLE VOL OR WT: ?1 ?CC  
TYPE: ?HEADING  
? ? GAS

DO (CRI OR LT) TO START ?  
? ? WRITTEN IN FILE 7 TAPE 20

RC GAS  
4/22/83 2032

SAMPLE COUNTING DATE 4/22/83 2021  
SAMPLE COLLECTION DATE 4/22/83 2011  
DECAY TIME 0 DAYS 10 MIN.  
ACQ. LIVE TIME 10.0 MIN.  
SAMPLE VOL./WT. 1.00E+00 CC/GR  
FWHM FILE NO. 1  
ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/22/83  
EFF FILE NO. 3 5 CC VIAL  
AIA PK. SRCH: 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	63.9	886	62458	40.0	1.5
2	80.7	402795	65480	0.2	1.6
3	112.9	633	40888	45.4	1.7
4	120.5	2017	39767	14.2	1.7
5	150.9	108112	34721	0.4	1.7
6	165.8	1264	28152	19.0	1.7
7	196.0	57058	23536	0.6	1.7
8	232.9	2212	26994	10.7	1.8
9	249.5	432857	23165	0.2	1.8
10	304.7	9155	7854	1.7	1.9
11	362.0	3496	5798	3.5	2.2
12	390.0	908	5845	12.4	2.3
13	395.9	3683	5653	3.3	2.3
14	402.3	29673	5385	0.7	2.3

RC GAS  
(SAMPLE #2)

4/22/83

Dastevens

15	409.7	3051	5155	3.9	2.4
16	414.3	7222	4529	1.8	2.4
17	455.2	747	3897	12.4	2.4
18	462.4	1571	3060	6.1	2.4
19	471.7	649	3812	14.0	2.4
20	499.2	207	4033	21.0	2.4
21	510.7	6506	4704	1.9	2.4
22	526.3	10612	7130	1.4	2.4
23	546.7	427	3607	20.5	2.4
24	586.2	137	3600	45.9	2.4
25	607.9	4849	3638	2.4	2.4
26	654.0	210	3125	38.4	2.4
27	673.8	740	3123	11.3	2.4
28	745.2	224	2277	30.9	2.4
29	788.3	180	2391	30.1	2.4
30	813.2	168	2292	41.0	2.4
31	821.1	172	2324	40.4	2.4
32	834.6	5754	2300	1.8	2.4
33	845.2	1827	2353	4.4	2.4
34	862.0	181	2021	35.9	2.4
35	872.0	308	1917	20.9	2.4
36	897.8	1467	1945	3.0	2.4
37	916.4	149	2195	45.5	2.4
38	925.5	393	2260	17.8	2.4
39	1009.1	703	2049	9.9	2.4
40	1039.2	322	2046	20.7	2.4
41	1141.1	558	1580	10.9	2.4
42	1174.1	424	1525	13.6	2.4
43	1179.5	416	1529	14.2	2.4
44	1185.0	160	1534	35.5	2.4
45	1250.2	302	1440	18.7	2.4
46	1293.2	9356	1715	1.2	2.4
47	1337.6	109	1369	49.0	2.4
48	1369.7	1171	1381	5.4	2.4
49	1382.3	124	1242	41.2	2.4
50	1407.1	129	1233	39.5	2.4
51	1435.5	1176	1236	5.1	2.4
52	1518.0	486	1373	11.7	2.4
53	1529.5	2646	1399	2.8	2.4
54	1603.4	127	1150	38.8	2.4
55	1616.8	141	1138	34.9	2.4
56	1684.7	232	1210	22.2	2.4
57	1740.5	221	1175	23.0	2.4
58	1767.8	1212	1339	5.1	2.4
59	1835.6	1028	1125	5.6	2.4
60	1880.6	596	1134	9.0	2.4

AIA ACT: CALC 7-D

RC GASES

NUCLIDE	UUCI/CC	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	7.42E-01 +/- 1.33E-03	1.00			
91.0	7.42E-01	35.00	40270.00	0.2	0.3
KR-85M	9.01E-02 +/- 3.42E-04	1.04			

RC GAS (Sample #2)  
4/22/83 DaSilva

149.3	9.01E-02	74.00	10809.99	0.4	-1.3
KE-88	1.30E-01 +/- 7.31E-04		1.04		
176.1	1.30E-01	15.00	5705.02	0.4	0.2
KE-133F	1.38E-02 +/- 1.48E-03		1.00		
222.8	1.38E-02	14.00	221.20	10.7	-0.0
KE-135	4.45E-01 +/- 6.68E-04		1.02		
249.6	4.45E-01	92.00	43280.01	0.2	0.1
KE-87	1.05E-01 +/- 7.04E-04		1.15		
403.0	1.05E-01	50.00	2767.01	0.7	0.8
KE-138	4.74E-02 +/- 8.34E-04		1.83		
434.4	4.74E-02	48.00	722.24	1.8	0.2
KE-13	3.20E-02 +/- 6.05E-04		2.77		
511.0	3.20E-02	123.00	650.63	1.9	0.4
KE-13EM	5.64E-02 +/- 7.11E-04		1.90		
527.0	5.64E-02	80.00	1061.03	1.3	0.8
AR-41	5.82E-02 +/- 6.98E-04		1.10		
1293.6	5.82E-02	99.00	935.03	1.2	0.3

# UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
63.95	88.64	40.0
113.05	63.34	45.4
120.65	201.74	14.1
165.75	126.44	19.0
304.75	915.05	1.7
361.95	349.64	3.5
389.05	90.84	12.4
395.04	368.34	3.3
408.65	305.14	3.8
455.14	74.75	12.4
462.34	157.14	6.1
471.64	64.94	14.0
499.14	20.74	43.9
546.65	42.75	20.5
586.15	18.94	45.5
607.85	484.94	2.3
654.75	21.04	38.3
673.75	74.05	11.3
745.15	22.44	30.8
708.35	18.04	39.1
813.25	16.84	41.0
821.15	17.25	40.4
834.65	575.45	1.8
845.25	183.74	4.4
862.05	18.14	35.9
872.05	30.84	20.9
897.85	146.74	5.0
916.45	14.84	45.5

RC GAS

(SAMPLE #2)

4/22/83

Dastevans

985.85	50.34	14.00
1009.18	70.43	10.00
1049.43	62.45	10.00
1141.25	55.04	10.00
1174.28	43.84	14.00
1179.65	41.63	14.00
1185.15	16.04	14.00
1250.15	30.04	10.00
1347.75	10.94	40.00
1367.05	117.14	5.4
1382.45	12.44	41.00
1407.25	12.94	10.00
1435.65	117.64	5.1
1510.25	40.65	11.7
1529.75	264.64	2.0
1603.65	12.64	30.00
1617.05	14.14	34.00
1684.94	23.24	22.00
1740.85	22.14	23.00
1769.15	121.25	5.1
1835.94	102.84	5.6
1880.65	59.65	9.0

RC LIQUID

(SAMPLE #2)

4/22/83

D. Stevens

EX DATA CTRL. PCM 7-D

AUTOMATIC ISOTOPE ANALYSIS  
4/22/83 2042

REQ. FILE NO. 72

R.C. LIQUID ANALYSIS: 8 ML VIAL 1 400 SEC 1 GAMMA ISOTOPIC

UPPC. FILE NO. ? LABEL ?

YRC LIO

SUBTRACT BEND ?N

DATE SAMPLE WAS COLLECTED

MO. 74

DAY 222

YEAR 71923

TIME 72011

SAMPLE VOL. OR WT. 71 ?CC

TYPE HEADING

RC LIO

TYPE CORR (OR LT) TO START ?

L SPEC. WRITTEN IN FILE 8 TAPE 29

RC LIO

4/22/83 2053

SAMPLE COUNTING DATE 4/22/83 2042

SAMPLE COLLECTION DATE 4/22/83 2011

DECAY TIME 0 DAYS 31 MIN.

ACC. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FWMH FILE NO. 1

ENS. CALIB. FILE 1 LAST CALIB. CHECK 4/22/83

EFF FILE NO. 2 8 ML VIAL

AIA PK. SRCH. 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWMH
1	63.4	818	61325	43.0	1.5
2	80.8	174461	56084	0.3	1.6
3	136.1	5936	42075	5.1	1.7
4	151.0	37001	43304	1.0	1.7
5	165.8	4799	35449	5.7	1.7
6	196.1	20581	39952	1.5	1.7
7	220.3	1000	34127	26.3	1.8
8	227.4	1585	33854	16.6	1.8
9	234.6	1652	33957	16.0	1.8
10	249.6	192499	30719	0.3	1.8
11	283.6	1444	26013	14.1	1.9
12	288.6	2970	25884	7.9	1.9
13	304.9	4007	25094	5.8	1.9
14	325.1	458	24780	48.8	2.0



RC LIQUID  
(SAMPLE #2)

4/22/83

Dastevens

15	337.2	492	333956	44.7	3.1
16	364.2	10974	333452	9.9	3.1
17	402.5	11433	10747	1.9	3.1
18	409.0	4014	18234	1.4	3.1
19	417.4	1870	17591	10.3	3.1
20	433.7	3182	16530	6.0	3.1
21	462.7	16350	16334	1.4	3.1
22	488.4	486	15863	39.0	3.1
23	510.8	55741	18295	0.8	3.1
24	521.8	2413	20450	9.9	3.1
25	529.8	41544	17385	0.7	3.1
26	540.4	2084	12337	9.0	3.1
27	546.7	7804	14094	1.4	3.1
28	563.7	343	13452	40.8	3.1
29	569.0	613	13495	27.4	3.1
30	585.0	2449	14063	6.9	3.1
31	606.3	4517	12313	1.9	3.1
32	621.6	3242	12307	3.3	3.1
33	629.8	2872	12397	15.7	3.1
34	674.0	358	12305	45.0	3.1
35	681.1	2772	11996	9.9	3.1
36	667.6	18240	11831	1.1	3.1
37	677.4	2465	9276	6.0	3.1
38	707.0	836	9133	15.6	3.1
39	727.6	1345	9143	9.9	3.1
40	736.3	1119	7754	11.3	3.1
41	772.5	11409	7744	1.8	3.1
42	795.8	1386	7271	9.1	3.1
43	801.7	469	7107	26.8	3.1
44	811.0	1267	7009	9.8	3.1
45	835.5	3519	6930	3.7	3.1
46	846.0	18055	6038	1.0	3.1
47	857.0	1129	6032	10.2	3.1
48	871.3	2738	6236	5.2	3.1
49	875.6	2812	6197	4.4	3.1
50	883.0	11567	5436	1.3	3.1
51	897.0	3674	5226	3.2	3.1
52	947.5	945	5212	11.3	3.1
53	954.5	1822	5297	6.1	3.1
54	973.8	1221	4457	8.2	3.1
55	984.5	271	5071	37.7	3.1
56	1009.5	7529	5263	1.8	3.1
57	1031.8	1316	4333	7.6	3.1
58	1038.0	2213	4296	4.7	3.1
59	1072.5	2258	4435	4.7	3.0
60	1101.9	395	3918	23.0	3.0
61	1123.9	1015	3647	9.0	3.0
62	1131.2	4767	3596	2.3	3.0
63	1136.6	2270	3552	4.3	3.0
64	1142.5	542	3508	16.0	3.0
65	1147.8	547	3472	15.8	3.0
66	1236.9	311	3009	25.6	3.1
67	1248.1	719	3001	11.4	3.1
68	1260.2	5437	2892	1.9	3.1
69	1293.3	3058	2729	3.0	3.2
70	1299.0	956	2295	7.8	3.2
71	1324.6	200	2205	33.9	3.2
72	1343.1	161	2271	42.6	3.2

RC LIQUID  
(SAMPLE #2)

4/22/83

Dastevens

73	1452.5	247	2111	27.1	2.3
74	1348.7	2400	2221	3.4	2.3
75	1399.5	445	2192	15.6	2.3
76	1438.5	12061	2261	1.0	2.3
77	1484.0	573	2052	11.2	2.3
78	1457.3	1578	1964	4.7	2.3
79	1518.1	351	1750	39.3	2.3
80	1529.6	804	1203	8.3	2.3
81	1613.8	543	1512	11.0	2.4
82	1622.0	161	1610	36.1	2.4
83	1643.1	150	1188	33.5	2.4
84	1654.9	167	1365	32.2	2.4
85	1677.9	1303	1408	4.7	2.4
86	1706.2	721	1117	7.3	2.4
87	1731.2	470	1117	10.9	2.4
88	1740.9	351	1203	15.0	2.4
89	1767.7	225	1021	21.2	2.4
90	1790.9	980	1156	3.8	2.4
91	1806.5	495	1019	10.2	2.4
92	1835.7	2898	1101	2.5	2.4
93	1881.0	259	1060	18.8	2.4
94	1897.4	261	937	17.7	2.5

DATA ACQ: CALC 7-D

# RC IODINES

NUCLIDE	8 ML VIAL	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-131	2.11E-02 +/- 4.54E-04	1.00			
364.5	2.11E-02	82.00	1097.03	2.2	0.4
I-132	6.36E-02 +/- 3.87E-03	1.20			
954.6	6.36E-02	16.70	193.24	6.1	0.1
I-133	1.09E-01 +/- 7.25E-04	1.02			
529.9	1.09E-01	89.00	4154.02	0.7	0.2
875.5	OVERLAP	4.40	107.42	4.4	-0.0
I-134	1.26E-01 +/- 1.63E-03	1.62			
884.1	1.26E-01	66.00	1156.03	1.3	0.2
I-135	1.04E-01 +/- 2.03E-03	1.06			
1240.5	1.04E-01	34.90	543.74	1.9	0.2

REG GUIDE 1.21

XE-133	3.40E-01 +/- 1.02E-03	1.00			
91.0	3.40E-01	35.00	17440.03	0.3	0.2
CU-67	***NOT IDENTIFIED***	1.00			
121.9	< 2.33E-04	87.00			
MO-99	***NOT IDENTIFIED***	1.00			
140.5	(< 5.92E-05)	360.01			
CE-141	***NOT IDENTIFIED***	1.00			

RC Liquid  
(SAMPLE #2)

4/22/83

Dastevens

145.4	( $\leq 5.05E-04$ )	42.00			
SN-117 ***NOT IDENTIFIED***			1.00		
159.4	( $\leq 2.84E-04$ )	87.00			
ML-135	$2.31E-01 \pm 6.00E-04$		1.05		
249.6	$2.31E-01$	92.00		17.60.01	0.3 0.0
CO-51 ***NOT IDENTIFIED***			1.00		
320.1	( $\leq 3.19E-03$ )	9.80			
I-131 MAJOR PEAK MISSING			1.00		
364.5*	$0.00E+00$	82.00		-0.05	--- 0.4
I-133 MAJOR PEAK MISSING			1.03		
529.2*	$0.00E+00$	89.00		0.05	--- 0.2
MA-140 ***NOT IDENTIFIED***			1.00		
537.3	( $\leq 1.71E-03$ )	34.00			
MLG GUIDE 1.21					
NU-103 ***NOT IDENTIFIED***			1.00		
597.1	( $\leq 4.12E-04$ )	90.00			
CO-137	$9.90E-03 \pm 5.83E-04$		1.00		
661.6	$9.90E-03$	86.00		277.33	5.9 0.6
NR-95 ***NOT IDENTIFIED***			1.00		
756.7	( $\leq 7.82E-04$ )	54.60			
NR-95	$4.17E-03 \pm 4.81E-04$		1.00		
765.8	$4.17E-03$	99.00		11.93	11.5 -0.3
CO-134	$6.11E-03 \pm 5.56E-04$		1.00		
795.8	$6.11E-03$	88.00		130.63	9.1 0.0
CO-58	$5.10E-03 \pm 4.97E-04$		1.00		
810.6	$5.10E-03$	99.00		126.74	9.7 -1.2
MM-54	$1.45E-02 \pm 5.43E-04$		1.00		
834.8	$1.45E-02$	100.00		351.94	3.7 -0.6
CS-136 ***NOT IDENTIFIED***			1.00		
1048.1	( $\leq 6.43E-04$ )	80.50			
FE-59 ***NOT IDENTIFIED***			1.00		
1099.3	( $\leq 8.88E-04$ )	56.50			
ZN-45 ***NOT IDENTIFIED***			1.00		
1115.4	( $\leq 1.01E-03$ )	49.00			
RCB GUIDE 1.21					
CO-40 ***NOT IDENTIFIED***			1.00		
1173.2	( $\leq 5.41E-04$ )	100.00			
LA-140 ***NOT IDENTIFIED***			1.00		

RC Liquid

(sample #2)

4/22/83

Dasteneva

1594.2 4.34E-04 96.50

SR-124 \*\*\*NOT IDENTIFIED\*\*\*

1691.0 (8.65E-04) 45.70

1.00

SR-120 1.58E-01 +/- 2.81E-03

1690.4 1.58E-01 53.00

2.18

750.94

1.8

-1.0

## UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
63.45	81.84	43.0
136.14	593.65	3.1
151.04	3700.04	1.0
165.75	479.94	3.7
196.04	2058.04	1.5
220.25	100.05	26.3
227.44	158.54	16.6
244.64	155.24	16.0
261.65	164.44	14.1
288.65	297.04	7.9
304.95	400.74	5.8
325.15	45.84	40.8
347.15	49.25	44.7
402.45	1143.05	1.9
408.24	601.45	3.4
417.34	187.04	10.3
433.64	318.24	6.0
462.64	1635.05	1.3
488.34	45.65	39.0
510.75	5574.04	0.5
521.75	211.34	9.9
540.35	208.44	8.0
546.65	789.44	2.4
562.65	34.34	48.5
569.85	61.34	27.1
595.15	244.94	6.9
606.25	451.74	3.8
621.55	324.24	5.3
629.75	297.25	5.7
636.05	35.84	45.2
667.55	1824.05	1.1
677.35	246.54	6.0
706.95	88.64	15.6
727.55	134.54	9.9
772.45	1138.05	1.4
801.75	46.94	25.8
846.95	1805.05	1.0
857.05	112.94	10.2
871.35	233.84	5.2
897.95	367.44	3.2
947.55	94.55	11.3
973.85	122.14	8.2
984.55	27.14	37.7
1031.85	131.64	7.6
1039.05	221.34	4.7
1072.65	225.84	4.7

RC LIQUID  
(SAMPLE #2)

4/22/83

D. Stevens

1102.08	10.08	24.0
1124.08	10.08	9.0
1131.08	10.08	12.0
1136.08	10.08	4.0
1142.08	10.08	16.0
1147.08	10.08	18.0
1237.08	10.08	24.0
1240.08	10.08	11.4
1292.08	10.08	2.0
1299.08	10.08	7.8
1324.08	10.08	33.9
1343.08	10.08	42.6
1352.08	10.08	27.1
1360.08	10.08	3.4
1390.08	10.08	15.6
1435.08	10.08	1.0
1444.08	10.08	11.5
1457.08	10.08	4.7
1510.08	10.08	39.5
1520.08	10.08	8.2
1614.08	10.08	14.0
1622.08	10.08	36.1
1642.08	10.08	43.5
1655.08	10.08	32.2
1670.08	10.08	4.7
1704.08	10.08	7.5
1731.08	10.08	10.9
1741.08	10.08	15.0
1760.08	10.08	21.2
1791.08	10.08	5.8
1806.08	10.08	10.2
1834.08	10.08	2.5
1881.08	10.08	18.8
1897.44	10.08	17.7

CMP-4,52-2  
FC-340  
R1 8-11-82  
1 OF 2

Reactor Power = 291%  
#5

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4,23,1983

SAMPLE TIME 1246

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 1.05E+03 UCI/CC

KR-85M = 1.17E-01 UCI/CC

KR-88 = 1.66E-01 UCI/CC

XE-133M = 1.17E-02 UCI/CC

XE-135 = 6.13E-01 UCI/CC

KR-87 = 1.36E-01 UCI/CC

XE-138 = 7.48E-02 UCI/CC

N-13 = 5.67E-02 UCI/CC

XE-135M = 9.36E-02 UCI/CC

AR-41 = 7.28E-02 UCI/CC

---

TOT GAS = 2.39E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*



1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION = 3.32E-01 UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION = 1.17E+00 UCI/CC

3. DEGAS FACTORS

C.F. = .61609 D.F. = .68466 T.D.F. = 1.1113

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M = 1.30E-01 UCI/CC

KR-88 = 1.85E-01 UCI/CC

XE-133M = 1.30E-02 UCI/CC

XE-135 = 6.81E-01 UCI/CC

KR-87 = 1.51E-01 UCI/CC

XE-138 = 8.31E-02 UCI/CC

N-13 = 6.30E-02 UCI/CC

XE-135M = 1.04E-01 UCI/CC

AR-41 = 8.09E-02 UCI/CC

RC GAS 1  
4/23/83  
Santi

DATA CTRL. RUN. 7-D

AUTOMATIC ISOTOPE ANALYSIS

4/23/83 1302

SEC. FILE NO. 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL 1 600 SEC

SPEC. FILE NO. 7 LABEL 7

7

SUBTRACT BOND 7N

DATE SAMPLE WAS COLLECTED

MO. 74

DAY 723

YEAR 71983

TIME 71246

SAMPLE VOL. OR WT. 71 7CC

TYPE HEADING

RC GAS

TYPE CORR (OR LT) TO START 7

SPEC. WRITTEN IN FILE 17 TAPE 20

RC GAS

4/23/83 1314

SAMPLE COUNTING DATE 4/23/83 1303

SAMPLE COLLECTION DATE 4/23/83 1246

DECAY TIME 0 DAYS 17 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FWHM FILE NO. 1

END. CALIB. FILE 1 LAST CALIB. CHECK 4/23/83

EFF FILE NO. 3 5 CC VIAL

DATA PK. SRCH. 7-A

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	80.7	436121	104401	0.1	1.6
2	98.2	815	57674	41.0	1.7
3	119.4	3289	40970	10.0	1.7
4	150.9	153409	53305	0.3	1.7
5	165.8	7820	36064	3.6	1.7
6	196.0	78570	35677	0.5	1.7
7	232.9	2086	44325	14.4	1.8
8	249.5	456208	39327	0.1	1.8
9	304.6	13606	12105	1.4	1.9
10	329.3	672	10930	22.3	2.0
11	356.9	1102	8909	12.5	2.1
12	362.0	5195	8509	2.9	2.2
13	390.0	1216	9250	11.5	2.3
14	395.8	4960	8976	3.1	2.3

RC Gasl.  
4/23/83.

15	402.2	40132	8592	0.6	2.4
16	408.5	3857	8263	2.7	2.4
17	434.2	9717	4912	1.6	2.4
18	455.3	482	6098	16.8	2.4
19	462.4	1972	8079	6.0	2.4
20	471.5	875	5923	13.6	2.4
21	499.8	449	6660	26.1	2.4
22	510.7	8162	6516	1.8	2.4
23	526.2	14029	6086	1.1	2.4
24	546.8	510	5441	20.9	2.4
25	607.9	7265	5750	1.8	2.4
26	623.5	251	5712	43.1	2.4
27	673.8	794	4585	12.6	2.4
28	731.7	265	3779	33.4	2.4
29	798.6	314	3343	26.6	2.4
30	813.3	248	3417	33.9	2.4
31	814.5	7660	3541	1.6	2.4
32	845.1	2380	3452	4.0	2.4
33	862.0	409	2913	19.3	2.4
34	871.1	336	2854	23.1	2.4
35	897.7	2242	3177	4.1	2.4
36	985.4	404	3425	21.1	2.4
37	1009.2	935	3105	9.0	2.4
38	1039.5	280	3433	29.4	2.4
39	1092.2	210	2558	33.5	2.4
40	1113.9	205	2464	35.0	2.4
41	1141.1	529	2397	13.6	2.4
42	1174.0	497	2222	14.1	2.4
43	1179.5	621	2459	12.0	2.4
44	1185.1	245	2149	27.5	2.4
45	1209.4	303	2290	23.1	2.4
46	1244.5	227	2283	30.5	2.4
47	1250.3	524	2374	13.9	2.4
48	1293.1	12473	2648	1.	2.4
49	1369.7	1815	1969	4.2	2.4
50	1435.4	1496	1921	4.9	2.4
51	1518.0	779	1936	8.8	2.4
52	1529.4	3524	1995	2.3	2.4
53	1586.1	125	1730	47.9	2.4
54	1603.6	294	1688	20.6	2.4
55	1684.6	270	1830	23.2	2.4
56	1740.4	345	1708	17.8	2.4
57	1761.0	135	1899	46.5	2.4
58	1767.7	1759	1714	4.1	2.4
59	1835.5	1725	1559	4.0	2.4
60	1880.5	1094	1472	5.8	2.4

DATA ACT. CALC 7-D

# RC GASES

NUCLIDE	UUCI/CC	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	1.17E+00 +/- 1.64E-03	1.00			
81.0	1.17E+00	35.00	63610.00	0.1	0.3
KR-85M	1.30E-01 +/- 4.29E-04	1.06			

Rc Gas. 1  
4/23/83

149.5	1.30E-01	74.00	15340.04	0.3	-1.4
NR-88	1.85E-01 +/- 9.07E-04		1.09		
176.1	1.85E-01	35.00	7956.99	0.5	0.0
ML-133M	1.30E-02 +/- 1.88E-03		1.00		
232.9	1.30E-02	14.00	702.62	14.4	-0.1
ME-135	6.81E-01 +/- 8.85E-04		1.03		
249.6	6.81E-01	92.00	65620.03	0.1	0.0
SR-87	1.51E-01 +/- 8.93E-04		1.22		
403.0	1.51E-01	50.00	4013.02	0.6	0.7
XL-138	8.31E-02 +/- 1.30E-03		2.39		
434.4	8.31E-02	48.00	971.03	1.6	0.1
N-13	6.30E-02 +/- 1.12E-03		4.35		
511.0	6.30E-02	123.00	836.03	1.8	0.2
KL-135M	1.04E-01 +/- 1.15E-03		2.52		
527.0	1.04E-01	80.00	1482.03	1.1	0.7
AR-41	8.09E-02 +/- 8.57E-04		1.14		
1293.6	8.09E-02	99.00	1247.03	1.1	0.3

# UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE (CPM)	% ERR
98.45	81.55	41.8
119.65	328.94	10.7
165.05	782.05	3.6
304.84	1360.05	1.4
329.54	67.25	22.3
357.04	110.25	12.5
362.15	519.55	2.9
390.15	121.64	11.5
395.95	496.04	3.1
408.65	385.74	3.7
455.14	46.25	25.8
462.54	197.24	6.0
471.64	82.55	13.6
498.95	44.94	26.1
546.95	51.05	20.9
608.05	726.55	1.8
623.65	25.14	43.1
673.95	79.44	12.6
732.05	26.54	33.4
788.75	31.44	26.6
813.45	24.84	33.9
834.65	766.05	1.6
845.25	238.04	4.0
862.15	40.94	19.3
871.25	33.65	23.1
897.05	224.24	4.1
985.55	40.44	21.1
1009.35	93.55	9.0

RC Gas. 1  
4/23/83.

1039.75	28.84	29.4
1092.45	21.84	23.5
1114.15	20.54	25.0
1141.35	53.94	13.5
1174.25	49.75	14.1
1179.75	62.15	12.0
1185.35	24.84	23.5
1209.65	30.34	23.1
1244.75	22.74	20.5
1250.55	52.44	13.9
1269.95	181.54	4.2
1435.45	169.54	4.9
1519.25	77.94	8.3
1529.75	352.44	2.5
1582.45	12.54	47.9
1602.95	29.44	20.6
1684.94	27.04	22.1
1740.85	34.55	17.8
1761.44	13.54	46.5
1769.15	175.94	4.1
1835.94	172.54	4.0
1880.55	109.44	5.8

RC Liquid 1  
4/23/83.

75 DATA CTRL: PEM: 7-D

AUTOMATIC ISOTOPE ANALYSIS

4/23/83 1319

SEQ. FILE NO. 72

N.L. LIQUID ANALYSIS: 8 ML VIAL : 600 SEC : GAMMA ISOTOPIC

SPEC. FILE NO.? LABEL ?

?

SUBTRACT BOND ?N

DATE SAMPLE WAS COLLECTED

MO. 74

DAY 223

YEAR 71983

TIME 71246

SAMPLE VOL. OR WT. ?1 ?GR

TYPE HEADING

RC LIQUID

TYPE ECR3 (OR LT) TO START ?

SPEC. WRITTEN IN FILE 19 TAPE 20

RC LIQUID

4/23/83 1331

SAMPLE COUNTING DATE 4/23/83 1320

SAMPLE COLLECTION DATE 4/23/83 1246

DECAY TIME 0 DAYS 34 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FWHM FILE NO. 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/23/83

EFF FILE NO. 2 8 ML VIAL

AIA PK. SRCH: 7-A

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	63.3	1322	66127	27.6	1.5
2	80.7	170254	60272	0.3	1.6
3	128.8	644	46765	47.7	1.7
4	136.2	7120	46158	4.4	1.7
5	150.9	33298	48019	1.1	1.7
6	165.8	4021	39687	7.2	1.7
7	196.0	17126	45032	1.9	1.7
8	220.2	2472	37132	11.2	1.8
9	249.5	186591	34455	0.3	1.8
10	283.3	1830	26440	12.8	1.9
11	288.4	3793	26327	6.3	1.9
12	305.0	3894	28912	6.4	1.9
13	325.0	569	28724	42.3	2.0
14	331.4	1339	31260	18.9	2.0



RC legend 1  
4/23/83.

15	339.8	972	26946	24.1	2.1
16	364.1	13891	21145	1.8	2.2
17	402.5	10338	21674	2.2	2.3
18	408.9	4140	21316	3.6	2.4
19	417.3	3277	20779	9.2	2.4
20	433.5	3427	19290	6.0	2.4
21	462.6	18123	19017	1.4	2.4
22	510.7	67163	21058	0.8	2.5
23	521.7	3749	23262	6.0	2.5
24	529.7	50684	19434	0.6	2.5
25	540.3	2553	14645	7.0	2.5
26	546.7	9043	15722	2.2	2.5
27	569.9	557	15659	32.1	2.6
28	595.1	3080	14930	5.9	2.6
29	605.8	4670	14646	3.9	2.6
30	621.6	3798	14726	4.8	2.6
31	629.8	3693	14529	4.9	2.6
32	637.0	1129	14356	15.3	2.6
33	650.1	521	14491	33.0	2.6
34	661.1	3647	13660	4.8	2.6
35	667.6	22334	13194	1.0	2.6
36	677.2	2691	12595	6.2	2.6
37	707.0	484	11151	31.2	2.6
38	728.1	1713	10228	8.7	2.6
39	739.2	328	8971	41.2	2.4
40	766.0	1607	9687	9.0	2.4
41	772.4	13722	8606	1.3	2.4
42	795.6	1614	8389	8.4	2.3
43	801.9	479	8204	27.1	2.3
44	811.9	1216	8227	10.9	2.3
45	835.7	3384	8068	4.1	2.3
46	846.8	20638	7786	0.9	2.3
47	857.0	1228	6863	10.0	2.2
48	872.5	2749	7569	4.9	2.2
49	883.9	12937	6650	1.3	2.2
50	897.9	4021	5801	3.1	2.2
51	910.7	234	6225	48.1	2.1
52	925.9	358	5364	29.4	2.1
53	947.4	1299	5787	8.7	2.1
54	954.4	2472	5746	4.8	2.1
55	973.8	1355	5118	7.9	2.1
56	1009.4	8267	5686	1.7	2.1
57	1031.7	1877	4840	5.7	2.1
58	1038.8	2675	4701	4.1	2.1
59	1072.4	2613	4953	4.3	2.0
60	1101.1	586	4151	16.1	2.0
61	1123.6	689	4502	14.3	2.0
62	1131.1	4970	4581	2.4	2.0
63	1136.6	2025	4649	5.3	2.0
64	1157.5	232	4008	39.1	2.0
65	1168.0	190	4038	47.9	2.0
66	1209.9	213	3816	41.6	2.0
67	1217.8	293	3556	29.4	2.0
68	1235.9	503	3212	16.5	2.1
69	1240.4	584	3585	15.1	2.1
70	1247.9	1073	3145	8.0	2.1
71	1260.1	6279	3018	1.8	2.1
72	1293.2	2716	3016	3.4	2.2

RC liquid 1  
4/23/83.

73	1299.0	863	2519	8.0	2.1
74	1341.3	194	2432	36.7	2.1
75	1458.4	2761	2432	3.2	2.1
76	1488.4	810	2334	11.8	2.1
77	1415.9	155	2323	46.7	2.1
78	1433.4	12556	2302	1.0	2.1
79	1457.1	1862	2119	4.2	2.1
80	1477.3	150	1917	40.0	2.1
81	1502.9	161	1793	40.0	2.1
82	1529.4	815	1964	9.4	2.1
83	1566.3	162	1795	37.8	2.1
84	1613.6	664	1616	9.4	2.1
85	1654.9	165	1492	34.0	2.1
86	1677.7	1682	1355	3.9	2.1
87	1706.1	813	1216	6.1	2.1
88	1731.3	382	1246	14.0	2.1
89	1741.0	353	1328	15.3	2.1
90	1769.0	102	1273	50.0	2.1
91	1790.9	1093	1335	5.2	2.1
92	1806.5	562	1120	9.4	2.1
93	1835.6	4010	1140	2.4	2.1
94	1881.4	121	1033	38.7	2.1
95	1897.7	299	898	15.3	2.1
96	1907.4	123	1753	49.0	5.0
97	1918.7	246	2145	27.4	5.8
98	1933.7	139	1389	39.1	4.0

AIA ACT: CALC 7-D

# RC IODINES

NUCLIDE ENERGY	8 ML VIAL	DECAY CORR. ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-131 244.5	2.67E-02 +/- 4.71E-04 2.67E-02	82.00	1389.03	1.8	0.3
I-132 954.6	8.69E-02 +/- 4.15E-03 8.69E-02	16.70	247.24	4.8	0.1
I-133 529.7 875.5	1.34E-01 +/- 7.91E-04 1.34E-01	89.00 4.40	3068.02	0.6	0.1
I-134 984.1	1.46E-01 +/- 1.82E-03 1.46E-01	66.00	1293.03	1.2	0.1
I-135 1260.5	1.21E-01 +/- 2.13E-03 1.21E-01	34.90	627.94	1.8	0.2
REG GUIDE 1.21					
XE-133 81.0	3.32E-01 +/- 1.03E-03 3.32E-01	35.00	17020.02	0.3	0.3
CO-57 121.9	***NOT IDENTIFIED*** ( $< 2.13E-04$ )	87.00			

RC liquid  
4/23/83

NO-99 ***NOT IDENTIFIED***	1.00			
140.5 (< 5.56E-05)	360.01			
UL-141 ***NOT IDENTIFIED***	1.00			
143.4 (< 4.83E-04)	48.00			
SM-117 ***NOT IDENTIFIED***	1.00			
158.4 (< 2.34E-04)	87.00			
XL-115 2.24E-01 +/- 6.05E-04	1.05			
249.6 2.24E-01	92.00	18450.02	0.3	0.0
OK-01 ***NOT IDENTIFIED***	1.00			
320.1 (< 3.09E-03)	9.80			
L-131 MAJOR PEAK MISSING	1.00			
344.5* 0.00E+00	82.00	0.05	---	0.3
L-133 MAJOR PEAK MISSING	1.02			
529.9* 0.00E+00	89.00	0.05	---	0.1
DO-140 ***NOT IDENTIFIED***	1.00			
537.3 (< 1.21E-03)	34.00			
REG GUIDE 1.21				
BU-103 ***NOT IDENTIFIED***	1.00			
497.1 (< 3.99E-04)	90.00			
CS-137 1.30E-02 +/- 6.27E-04	1.00			
561.6 1.30E-02	86.00	364.73	4.8	0.4
ZR-95 ***NOT IDENTIFIED***	1.00			
756.7 (< 7.61E-04)	54.60			
NP-95 6.00E-03 +/- 5.40E-04	1.00			
765.8 6.00E-03	99.00	160.74	9.0	-0.2
CS-124 7.12E-03 +/- 5.98E-04	1.00			
795.8 7.12E-03	88.00	161.42	8.4	0.1
CU-50 4.89E-03 +/- 5.35E-04	1.00			
810.6 4.89E-03	99.00	121.63	10.9	-1.2
MN-54 1.39E-02 +/- 5.76E-04	1.00			
834.8 1.39E-02	100.00	338.44	4.1	-0.9
CS-126 ***NOT IDENTIFIED***	1.00			
1048.1 (< 5.83E-04)	80.50			
FE-50 5.77E-03 +/- 9.29E-04	1.00			
1099.3 5.77E-03	56.50	58.64	16.1	-1.9
ZN-65 ***NOT IDENTIFIED***	1.00			
1115.4 (< 9.74E-04)	49.00			

REG GUIDE 1.21

RC liquid  
4/23/83

CO-60 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1173.2 (C 5.07E-04) 100.00

LA-140 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1596.2 (C 4.03E-04) 94.50

SB-124 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1691.0 (C 8.02E-04) 45.70

ES-178 1.84E-01 +/- 3.08E-03 2.29  
1000.4 1.84E-01 53.00 834.03 1.7 -1.0

UNIDENTIFIED PHOTOPEAKS

ENERGY RATE (CPM) % ERR

63.25	132.24	27.6
129.04	64.44	47.7
136.25	712.05	4.4
151.04	3329.04	1.1
165.05	402.14	7.2
196.14	1712.05	1.9
220.34	247.24	11.2
293.54	183.04	12.8
298.65	379.34	6.3
305.25	389.44	6.4
325.25	56.94	42.3
331.45	133.94	18.9
339.95	97.25	24.1
402.45	1033.05	2.2
409.04	614.05	3.6
417.45	227.74	9.2
433.44	342.74	6.0
462.75	1812.05	1.3
510.84	6716.04	0.5
521.85	374.94	6.0
540.45	255.34	7.0
546.85	904.05	2.2
570.05	55.75	32.1
595.25	308.04	5.9
605.95	467.04	3.9
621.75	379.84	4.8
629.95	369.34	4.9
637.15	112.94	15.3
650.25	52.15	33.0
667.75	2233.04	1.0
677.35	269.14	6.2
707.15	48.44	31.2
728.25	171.34	8.7
739.35	32.75	41.2
772.55	1372.05	1.3
802.05	47.94	27.1
846.95	2063.04	0.9
857.15	122.84	10.0
872.65	274.84	4.9
898.05	402.14	3.1
910.85	23.44	48.1
926.05	35.84	29.4

Re Liquid 1  
4/23/83

947.88	129.94	9.7
973.98	135.84	9.9
1031.88	187.74	8.7
1059.08	267.84	8.1
1072.88	261.34	8.8
1123.88	68.88	14.8
1131.38	497.04	2.4
1136.88	202.84	8.8
1157.78	23.24	79.1
1168.28	19.04	47.9
1210.18	21.34	41.6
1218.08	29.34	29.4
1236.18	50.34	16.8
1240.68	58.44	15.1
1248.18	107.34	8.0
1293.48	271.84	3.4
1298.28	96.34	8.0
1343.88	19.44	36.7
1368.68	270.14	3.2
1398.68	61.94	11.8
1416.18	15.84	44.7
1435.68	1355.05	1.0
1457.38	186.24	4.2
1477.68	15.84	40.0
1508.28	16.14	40.0
1529.78	83.88	9.8
1566.68	16.28	37.8
1613.98	66.44	9.4
1655.28	16.84	34.0
1678.08	168.24	3.9
1706.44	91.34	6.3
1731.78	38.28	14.0
1741.44	35.34	15.8
1768.44	10.34	50.0
1791.38	108.34	5.6
1806.94	56.28	9.4
1836.08	301.04	2.4
1881.44	12.14	38.7
1897.78	29.94	15.8
1907.44	12.34	49.0
1918.78	24.64	27.4
1933.78	13.84	39.1



RC Gas 2  
4-23-83

196.1	1.54E-01	75.00	6556.00	0.5	
XL-123M	1.87E-02 +/- 1.67E-03		1.00		
232.0	1.87E-02	14.00	299.42	0.9	-0.1
XL-135	5.69E-01 +/- 7.97E-04		1.03		
249.4	5.69E-01	92.00	54850.00	0.1	0.1
NR-87	1.27E-01 +/- 8.16E-04		1.22		
403.0	1.27E-01	50.00	3369.01	0.6	0.7
XL-132	6.94E-02 +/- 1.12E-03		2.42		
434.4	6.94E-02	48.00	803.03	1.7	0.1
N-13	5.32E-02 +/- 9.95E-04		4.43		
511.0	5.32E-02	123.00	672.74	1.9	0.3
XL-125M	8.95E-02 +/- 1.05E-03		2.55		
527.0	8.95E-02	80.00	1244.03	1.2	0.7
OR-41	6.88E-02 +/- 7.78E-04		1.15		
1293.6	6.88E-02	99.00	1039.03	1.1	0.3

UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
120.05	330.94	9.7
129.44	73.85	41.3
165.05	260.54	10.1
304.84	1141.05	1.5
329.45	55.15	24.0
357.15	91.75	13.3
362.15	399.14	3.3
390.15	120.64	10.2
395.84	415.94	3.2
408.65	335.04	3.8
455.14	30.64	34.7
462.64	149.44	7.1
471.75	47.65	20.9
499.04	28.54	36.5
546.85	34.34	27.8
607.95	577.25	2.1
635.45	26.14	35.2
673.75	67.64	13.2
788.55	24.84	30.5
813.85	20.04	37.2
834.65	671.84	1.7
845.25	197.54	4.4
862.45	30.94	24.1
871.75	21.24	34.5
897.85	175.34	4.8
944.75	35.45	20.7
985.75	45.65	16.8
1009.45	83.25	9.1
1039.85	27.94	27.2
1113.75	17.64	38.7
1141.25	44.75	14.7



Reactor power = 91%

#6

CMP-4.52-2  
FC-340  
R1 R-11-82  
1 OF 2

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.23.1983

SAMPLE TIME 1344

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 9.56E-01 UCI/CC

KR-85M = 1.07E-01 UCI/CC

KR-88 = 1.51E-01 UCI/CC

XE-133M = 1.83E-02 UCI/CC

XE-135 = 5.57E-01 UCI/CC

KR-87 = 1.24E-01 UCI/CC

XE-138 = 6.81E-02 UCI/CC

N-13 = 5.21E-02 UCI/CC

XE-135M = 8.76E-02 UCI/CC

AR-41 = 6.73E-02 UCI/CC

-----  
TOT GAS = 2.19E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*\*

CMP-4,52-3  
FC-340  
R1 8-11-82  
1 OF 2

1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION = 3.54E-01 UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION = 9.77E-01 UCI/CC

3. DEGAS FACTORS

C.F. = .61609 D.F. = .62967 T.D.F. = 1.0221

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M = 1.09E-01 UCI/CC

KR-88 = 1.54E-01 UCI/CC

XE-133M = 1.87E-02 UCI/CC

XE-135 = 5.69E-01 UCI/CC

KR-87 = 1.27E-01 UCI/CC

XE-138 = 6.96E-02 UCI/CC

N-13 = 5.32E-02 UCI/CC

XE-135M = 8.95E-02 UCI/CC

AR-41 = 6.88E-02 UCI/CC

RC Gas 2

4-23-83

CD

XX OAI CTRL: PGM: 7-D

AUTOMATIC ISOTOPE ANALYSIS

4/23/83 1400

SEQ. FILE NO: ?1

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL : 600 SEC

SPEC. FILE NO. ? LABEL ?

?

SUBTRACT BGND ?N

DATE SAMPLE WAS COLLECTED

MO. ?4

DAY ?23

YEAR ?1983

TIME ?1344

SAMPLE VOL. OR WT. ?1 ?CC

TYPE HEADINGS

RC GAS

TYPE (CR1 (OR LT) TO START ?

SPEC. WRITTEN IN FILE 19 TAPE 28

RC GAS

4/23/83 1412

SAMPLE COUNTING DATE 4/23/83 1401

SAMPLE COLLECTION DATE 4/23/83 1344

DECAY TIME 0 DAYS 17 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FMMH FILE NO. 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/23/83

EFF FILE NO. 3 5 CC VIAL

AIA PK. SRCH. 7-A

NO.	CENTROID	NET INTG.	SKOD.	% ERROR	FMMH
1	80.6	529077	84586	0.2	1.6
2	119.8	3309	49959	9.7	1.7
3	129.2	738	46153	41.3	1.7
4	150.9	128508	42682	0.4	1.7
5	165.8	2605	33400	10.1	1.7
6	196.0	65567	29134	0.5	1.7
7	232.9	2996	34024	8.9	1.8
8	249.4	548591	30401	0.1	1.8
9	304.6	11418	9406	1.5	1.9
10	329.2	551	8486	24.0	2.0
11	357.0	917	7038	13.4	2.1
12	362.0	3991	6818	3.3	2.2
13	390.0	1206	7007	10.2	2.3
14	395.7	4159	6919	3.2	2.3

RC Gas 2  
4-23-83

15	402.2	33698	4556	0.6	2.2
16	408.5	3350	4370	3.8	2.3
17	434.2	8021	5310	1.7	2.3
18	455.0	306	5483	24.7	2.4
19	462.5	1494	4842	7.1	2.4
20	471.6	476	4730	20.9	2.4
21	498.9	285	5260	36.5	2.4
22	510.4	6737	4581	1.9	2.5
23	526.2	12469	4676	1.2	2.5
24	546.7	343	4305	27.8	2.6
25	607.8	5772	4443	2.1	2.6
26	635.3	261	4096	35.2	2.6
27	673.6	676	3657	13.2	2.6
28	788.4	248	2745	30.3	2.7
29	813.7	200	2674	37.2	2.7
30	834.5	6719	2790	1.7	2.7
31	845.1	1975	2800	4.4	2.7
32	862.3	309	2614	24.1	2.7
33	871.6	212	2575	34.5	2.7
34	897.7	1753	2605	4.8	2.7
35	944.6	354	2509	20.7	2.1
36	985.6	456	2715	16.8	2.1
37	1009.3	832	2448	9.1	2.1
38	1039.6	279	2749	27.2	2.1
39	1113.5	176	2236	38.7	2.0
40	1141.0	447	1930	14.7	2.0
41	1173.9	413	1791	15.3	2.0
42	1179.6	412	1773	15.3	2.0
43	1184.9	355	1758	17.5	2.0
44	1250.4	343	1897	18.8	2.1
45	1293.1	10592	1984	1.1	2.2
46	1369.7	1496	1608	4.6	2.3
47	1381.8	118	1560	48.2	2.3
48	1435.5	1190	1535	5.3	2.3
49	1518.1	525	1581	11.6	2.3
50	1529.4	3024	1659	2.6	2.3
51	1642.1	117	1270	44.1	2.4
52	1685.1	296	1357	18.5	2.4
53	1740.4	310	1336	17.6	2.4
54	1767.8	1363	1450	4.8	2.4
55	1835.5	1343	1191	4.3	2.4
56	1850.3	101	1220	49.9	2.4
57	1880.3	764	1266	7.5	2.4

AIA ACT. CALC 7-D

# RC GASES

NUCLIDE	UUCI/CC	DECAY CORR:			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	9.77E-01 +/- 1.46E-03	1.00			
01.0	9.77E-01	35.00	52900.00	0.2	0.4
KR-85M	1.09E-01 +/- 3.81E-04	1.06			
149.5	1.09E-01	74.00	12850.00	0.4	-1.4
KR-88	1.54E-01 +/- 8.20E-04	1.09			

X DATA CTRL: PEM: 7-D

AUTOMATIC ISOTOPE ANALYSIS

4/23/83 1417

SEQ: FILE NO: 72

N.C. LIQUID ANALYSIS: 8 ML VIAL 1 600 SEC 1 GAMMA ISOTOPIC

OPLO: FILE NO: 7 LABEL 7

NRCLIN

SUBTRACT BOND 7N

DATE SAMPLE WAS COLLECTED

MO: 74

DAY: 723

YEAR: 71993

TIME: 71144

SAMPLE VOL: DR WT: 71 PCC

TYPE: HEADING

NRCLIN2

TYPE: (CR) (OR LT) TO START 7

SPEC: WRITTEN IN FILE 20 TAPE 20

NRCLIN2

4/23/83

1429

SAMPLE COUNTING DATE 4/23/83 1418

SAMPLE COLLECTION DATE 4/23/83 1344

DECAY TIME 0 DAYS 34 MIN.

ACC: LIVE TIME 10.0 MIN.

SAMPLE VOL./WT: 1.00E+00 CC/GR

FWHM FILE NO: 1

ENG: CALIB: FILE 1 LAST CALIB: CHECK 4/23/83

EFF FILE NO: 2 8 ML VIAL

AIA PK: SRCH: 7-A

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	63.3	1443	48060	25.7	1.5
2	80.7	181314	41687	0.3	1.6
3	120.8	786	47262	39.3	1.7
4	135.9	5401	48011	5.9	1.7
5	150.9	35209	49042	1.0	1.7
6	165.7	4148	40268	7.0	1.7
7	196.0	18915	45749	1.8	1.7
8	220.2	2002	37825	13.9	1.8
9	227.5	576	39009	48.7	1.8
10	234.2	1385	38571	20.2	1.8
11	249.5	198595	34619	0.3	1.8
12	274.8	503	30045	48.9	1.8
13	283.5	1528	26097	15.2	1.9
14	288.5	3672	25933	6.4	1.9
15	304.9	4481	28870	5.6	1.9

RC wig 2  
4-23-83  
Santi



RC hig 2  
4-23-83  
Santi

18	351.0	119	24899	35.3	2.1
19	356.1	683	24926	34.9	2.1
20	364.1	14039	23844	1.7	2.2
21	393.0	605	21507	30.3	2.3
22	402.4	11139	21145	2.1	2.3
23	402.0	6196	20834	3.3	2.3
24	417.1	2260	20368	9.2	2.3
25	437.7	3833	12943	19.3	2.3
26	445.0	431	10607	44.0	2.3
27	462.6	16445	10045	1.4	2.4
28	482.0	036	10506	24.9	2.4
29	510.7	62738	21334	0.5	2.5
30	521.7	4277	12740	19.3	2.5
31	529.7	50268	19287	0.6	2.5
32	540.4	2284	14668	7.0	2.5
33	546.7	8702	18903	2.3	2.5
34	564.1	981	15111	10.6	2.6
35	569.3	1027	13084	17.2	2.6
36	595.0	2910	18081	6.2	2.6
37	606.0	4340	15005	4.3	2.6
38	621.5	1066	14862	4.6	2.6
39	629.0	4002	14401	4.6	2.6
40	637.0	826	14597	21.0	2.6
41	650.1	703	14600	24.6	2.6
42	661.1	3237	14787	5.4	2.6
43	667.5	22179	11908	1.0	2.7
44	677.2	3014	12416	5.0	2.8
45	706.7	773	10555	19.1	2.8
46	727.1	1624	10176	9.1	2.8
47	765.0	1111	8682	12.2	2.4
48	772.4	13639	8627	1.3	2.4
49	795.6	1475	8279	9.1	2.2
50	801.9	387	8149	33.4	2.2
51	811.0	1606	7935	0.2	2.2

50	835.6	3972	7760	3.5	2.2
51	841.9	20604	7620	0.9	2.2
52	856.0	1538	6891	7.9	2.2
53	871.1	2381	7098	5.4	2.2
54	875.4	2879	7011	4.5	2.2
55	881.9	13387	6066	1.2	2.2
56	897.0	3887	5624	3.2	2.2
57	910.3	301	6143	37.3	2.1
58	947.5	1342	5723	8.4	2.1
59	954.3	2299	5680	5.1	2.1
60	973.6	1549	5556	7.3	2.1
61	984.8	333	4948	30.4	2.1
62	1009.4	7210	5868	1.9	2.1
63	1031.7	1618	4846	6.6	2.1
64	1038.7	2512	4769	4.4	2.1
65	1052.0	323	4470	29.8	2.0
66	1072.3	2442	4357	4.3	2.0
67	1101.3	615	4132	15.3	2.0
68	1123.6	947	4119	10.1	2.0
69	1131.1	5332	4036	2.2	2.0
70	1136.6	2458	3966	4.1	2.0
71	1142.9	658	3895	14.0	2.0
72	1146.5	731	4336	13.3	2.0
73	1158.4	187	3782	47.1	2.0



RC lig 2  
4-23-83  
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74	1168.5	415	3827	28.3	2.0
75	1173.6	308	3869	29.1	2.0
76	1195.9	195	3929	46.0	2.0
77	1235.9	290	3272	28.5	2.1
78	1240.6	418	3651	21.0	2.1
79	1248.0	829	3202	10.3	2.1
80	1260.1	6289	2982	1.8	2.1
81	1293.2	2962	2937	3.2	2.2
82	1299.0	986	2486	7.8	2.2
83	1325.1	960	2183	27.3	2.2
84	1368.5	2280	2322	3.4	2.3
85	1398.4	734	2275	9.9	2.3
86	1426.3	261	2338	26.9	2.3
87	1435.4	13390	2292	1.0	2.3
88	1444.0	524	2245	13.5	2.3
89	1457.2	1850	2088	4.2	2.3
90	1468.7	166	1967	38.6	2.3
91	1502.8	324	1876	19.8	2.3
92	1529.4	947	1900	7.3	2.3
93	1566.1	139	1818	44.2	2.3
94	1613.2	682	1553	9.0	2.4
95	1645.4	130	1276	39.0	2.4
96	1677.7	1627	1297	3.9	2.4
97	1685.0	179	1381	30.3	2.4
98	1706.2	830	1247	6.9	2.4
99	1731.3	340	1203	15.4	2.4
100	1741.1	213	1341	17.5	2.4

PLANS ABOVE NO. 100 ARE PRINTED OUT BUT NOT SAVED

101	1767.8	126	1273	41.0	2.4
102	1790.9	1239	1240	4.9	2.4
103	1806.3	615	1071	8.5	2.4
104	1835.6	2980	1098	2.5	2.4
105	1880.6	137	1028	34.2	2.4

106	1897.3	233	974	20.1	2.5
107	1920.4	291	1737	21.1	4.8

DATA ACT. CALC 7-D

RC IODINES

NUCLIDE	8 ML VIAL	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-131	2.70E-02 +/- 4.67E-04	1.00			
364.5	2.70E-02	82.00	1402.02	1.7	0.3
I-132	8.10E-02 +/- 4.11E-03	1.22			
954.6	8.10E-02	16.70	229.93	5.1	0.2
I-133	1.33E-01 +/- 7.85E-04	1.02			
529.9	1.33E-01	89.00	5026.02	0.6	0.1
875.5	OVERLAP	4.40	129.96	4.5	0.0
I-134	1.52E-01 +/- 1.81E-03	1.68			
894.1	1.52E-01	66.00	1438.03	1.2	0.1
I-135	1.21E-01 +/- 2.14E-03	1.07			

1240.5 1.21E-01 34.90 622.94 1.2 0.2

RC lig 2  
4-23-83  
Sault

REG GUIDE 1.21

KE-133	3.54E-01 +/- 1.04E-03	1.00			
21.0	3.54E-01	35.00	13130.04	0.3	0.2
CE-57	5.55E-04 +/- 2.18E-04	1.00			
121.9	5.55E-04	87.00	78.60	37.3	0.9
MO-99	***NOT IDENTIFIED***	1.00			
140.5	(< 6.27E-05)	340.01			
CE-141	***NOT IDENTIFIED***	1.00			
145.4	(< 5.24E-04)	48.00			
SM-117H	***NOT IDENTIFIED***	1.00			
158.4	(< 2.95E-04)	87.00			
KE-135	2.39E-01 +/- 5.21E-04	1.03			
249.4	2.39E-01	92.00	19050.01	0.3	0.0
CR-51	***NOT IDENTIFIED***	1.00			
320.1	(< 3.71E-03)	9.80			
I-131	MAJOR PEAK MISSING	1.00			
344.5*	0.00E+00	82.00	0.05	---	0.3
I-133	MAJOR PEAK MISSING	1.02			
529.9*	0.00E+00	89.00	0.05	---	0.1
BA-140	***NOT IDENTIFIED***	1.00			
537.3	(< 1.85E-03)	34.00			

REG GUIDE 1.21

NU-103	***NOT IDENTIFIED***	1.00			
497.1	(< 4.42E-04)	90.00			
CE-137	1.15E-02 +/- 6.25E-04	1.00			
461.6	1.15E-02	86.00	323.33	5.4	0.4
ZR-95	***NOT IDENTIFIED***	1.00			
756.7	(< 8.41E-04)	54.60			
NB-95	4.14E-03 +/- 5.07E-04	1.00			
745.8	4.14E-03	99.00	111.13	12.2	-0.0
CS-134	6.51E-03 +/- 5.92E-04	1.00			
795.8	6.51E-03	88.00	147.53	9.1	0.1
CO-58	6.46E-03 +/- 5.32E-04	1.00			
810.6	6.46E-03	99.00	160.63	8.2	-1.2
MN-54	1.64E-02 +/- 5.76E-04	1.00			
834.8	1.64E-02	100.00	397.83	3.5	-0.8

CS-134 \*\*\*NOT IDENTIFIED\*\*\* 1.00

1048.1 (C 1.62E-04) 20.50

RC has  
4-23-83  
Sault

FE-59 6.06E-03 +/- 9.29E-04 1.00  
1099.3 6.06E-03 56.50

61.54 15.3

2N-68 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1115.4 (< 1.07E-03) 49.00

LINE GUIDE 1.21

CO-60 1.82E-03 +/- 5.32E-04 1.00  
1173.2 1.82E-03 100.00

30.84 29.1 -0.5

LA-140 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1596.2 < 4.47E-04 96.50

SB-124 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
1691.0 (< 8.84E-04) 45.70

CS-132 1.61E-01 +/- 3.06E-03 2.32  
1009.4 1.61E-01 53.00

721.03 1.9 -1.0

# UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
43.35	144.34	25.7
136.04	540.15	5.9
151.04	3320.04	1.0
165.75	414.84	7.0
196.14	1891.05	1.7
220.34	200.24	13.9
227.64	57.65	48.7
234.34	138.54	20.2

275.04	50.34	48.9
282.75	152.84	15.2
288.75	167.24	6.4
305.15	448.14	5.6
351.34	61.94	36.3
356.45	98.34	23.8
395.95	68.55	30.5
402.54	1113.05	2.1
408.95	618.65	3.5
417.45	229.04	9.1
433.84	383.84	5.3
445.34	45.15	43.0
462.75	1634.05	1.4
488.95	83.64	23.9
510.84	6273.04	0.5
521.85	427.74	5.2
540.55	229.44	7.8
546.85	870.05	2.3
564.25	95.14	18.6
569.45	102.75	17.2
595.15	291.04	6.2
606.15	434.94	4.3
621.65	396.64	4.6
629.95	400.24	4.4

632.15	82.44	21.0
680.25	70.35	24.6
647.45	2217.04	1.0
677.25	301.44	5.5
706.05	77.34	19.1
727.25	163.44	9.1
772.05	1363.05	1.3
802.05	38.75	33.4
847.05	2060.04	0.9
857.05	153.84	7.9
871.25	238.14	5.4
897.95	388.74	3.2
910.45	30.14	37.3
947.65	134.24	8.4
973.75	154.94	7.3
984.95	33.34	50.4
1031.05	161.84	6.6
1038.95	231.24	4.4
1052.05	32.34	29.8
1072.55	244.24	4.3
1123.85	94.75	10.1
1131.35	533.25	2.2
1134.85	245.84	4.1
1142.15	65.85	14.0
1146.75	73.14	13.3
1152.65	18.75	47.1
1162.75	31.94	28.3
1196.15	19.34	46.0
1226.15	29.04	28.5
1240.85	41.84	21.0
1248.25	82.94	10.3
1293.45	296.25	3.2
1299.25	98.64	7.8
1325.35	26.04	27.3

1368.75	278.04	3.1
1398.65	73.44	9.9
1426.55	26.14	26.9
1435.65	1339.05	1.0
1444.25	52.44	13.5
1457.45	185.04	4.2
1469.05	16.64	38.6
1503.15	32.45	19.8
1529.75	94.75	7.3
1566.45	13.94	44.2
1613.55	68.25	9.0
1645.75	13.84	39.0
1672.05	168.74	3.9
1685.35	17.94	30.3
1704.55	83.05	6.9
1731.75	34.05	15.4
1741.55	31.34	17.5

Reactor Power = 91%

CMP-4,52-2  
FC-340  
R1 8-11-82  
1 OF 2

#7

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.23.1983

SAMPLE TIME 1446

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 1.05E+00 UCI/CC

KR-85M = 1.14E-01 UCI/CC

KR-88 = 1.61E-01 UCI/CC

XE-133M = 1.80E-02 UCI/CC

XE-135 = 6.03E-01 UCI/CC

KR-87 = 1.28E-01 UCI/CC

XE-138 = 6.32E-02 UCI/CC

N-13 = 5.14E-02 UCI/CC

XE-135M = 9.03E-02 UCI/CC

AR-41 = 6.73E-02 UCI/CC

-----  
TOT GAS = 2.35E+00 UCI/CC

H2 CONC. IN CC/KG = \*\*\*\*\*

CMP-4.52-3  
FC-340  
R1 8-11-82  
1 OF 2

1. LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $4.38\text{E}-01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $1.00\text{E}+00$  UCI/CC

3. DEGAS FACTORS

C.F. = .61609      D.F. = .58447      T.D.F. = .9487

4. HYDROGEN INPUTS

H2 STD DIVISIONS AT 1 ATTN. = 1.00

H2 SAMPLE DIVISIONS AT 1 ATTN. = 1.00

5. GAS ACTIVITY INPUTS

KR-85M =  $1.08\text{E}-01$  UCI/CC

KR-88 =  $1.53\text{E}-01$  UCI/CC

XE-133M =  $1.71\text{E}-02$  UCI/CC

XE-135 =  $5.72\text{E}-01$  UCI/CC

KR-87 =  $1.21\text{E}-01$  UCI/CC

XE-138 =  $6.00\text{E}-02$  UCI/CC

N-13 =  $4.88\text{E}-02$  UCI/CC

XE-135M =  $8.57\text{E}-02$  UCI/CC

AR-41 =  $6.38\text{E}-02$  UCI/CC



RC 643  
4-23-83

\*% DATA CTRL: PCM: 7-D'

AUTOMATIC ISOTOPE ANALYSIS  
4/23/83 1504  
OLD: FILE NO: 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL : 600 SEC  
SPEC: FILE NO: ? LABEL ?  
78C 3  
SUBTRACT BOND ?N  
DATE SAMPLE WAS COLLECTED

NO: 74  
DAY 723  
YEAR 71983  
TIME 71446  
SAMPLE VOL: OR WT: 71 7CC  
TYPE HEADING  
RC 3  
TYPE [CR] (OR LT) TO START ?  
SPEC: WRITTEN IN FILE 21 TAPE 28

RC 2  
4/23/83 1515

SAMPLE COUNTING DATE 4/23/83 1504  
SAMPLE COLLECTION DATE 4/23/83 1446  
DECAY TIME 0 DAYS 18 MIN:  
ACQ: LIVE TIME 10.0 MIN:  
SAMPLE VOL./WT: 1.00E+00 CC/GR  
FWHM FILE NO: 1  
ENG: CALIB: FILE 1 LAST CALIB: CHECK 4/23/83  
EFF FILE NO: 3 5 CC VIAL  
AIA PK: SRCH: 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	80.6	546575	84341	0.2	1.6
2	119.8	2849	48699	11.1	1.7
3	150.9	127620	41541	0.4	1.7
4	165.7	6080	28201	4.1	1.7
5	196.0	64805	28001	0.5	1.7
6	232.9	2729	32940	9.6	1.8
7	249.4	550387	29052	0.1	1.8
8	304.6	11063	8873	1.5	1.9
9	329.4	545	8893	24.8	2.0
10	357.0	1023	6634	11.7	2.1
11	362.0	4029	6498	3.2	2.2
12	390.1	1101	6721	11.0	2.3
13	395.7	3587	6532	3.6	2.3
14	402.2	31672	6267	0.7	2.3

RC *copy* 3  
4-23-83

15	408.5	3044	4041	4.0	2.3
16	413.0	1057	4523	11.2	2.2
17	434.2	6515	5167	2.0	2.2
18	462.5	1357	4716	7.7	2.4
19	471.5	414	4667	23.9	2.4
20	510.7	5549	4477	2.2	2.5
21	524.2	11191	4656	1.3	2.5
22	590.5	227	4045	40.2	2.6
23	607.9	5829	4241	2.1	2.6
24	614.2	1120	4158	8.6	2.7
25	673.7	720	3442	12.1	2.6
26	744.5	200	2563	36.7	2.4
27	788.1	189	2710	39.8	2.4
28	812.9	214	2586	34.3	2.7
29	814.5	6318	2791	1.7	2.3
30	845.1	1897	2763	4.6	2.2
31	862.2	369	2496	19.8	2.2
32	897.7	2007	2331	4.1	2.2
33	945.2	276	2166	24.6	2.1
34	985.2	389	2492	19.5	2.1
35	1009.3	755	2492	10.4	2.1
36	1039.1	251	2362	28.1	2.1
37	1113.6	147	1929	43.1	2.0
38	1141.0	502	1855	12.9	2.0
39	1173.9	469	1703	13.3	2.0
40	1179.7	344	1718	17.9	2.0
41	1184.9	172	1730	33.9	2.0
42	1206.9	279	1538	20.8	2.0
43	1250.0	341	1588	16.5	2.1
44	1293.1	9725	1999	1.2	2.2
45	1336.8	124	1528	45.5	2.3
46	1369.7	1544	1499	4.3	2.3
47	1399.1	120	1377	44.7	2.3
48	1435.4	1144	1503	5.6	2.3
49	1517.9	550	1521	10.8	2.2
50	1529.4	2796	1636	2.8	2.2
51	1603.0	152	1531	37.3	2.4
52	1684.8	358	1263	15.0	2.4
53	1720.8	124	1319	32.3	2.4
54	1740.1	258	1430	21.6	2.4
55	1767.8	970	1598	6.6	2.4
56	1835.5	1486	1184	4.2	2.4
57	1880.4	770	1155	7.2	2.4

LAIA ACT. CALC 7-D

RC GASES

NUCLIDE	ENERGY	UUCI/CC	DECAY CORR.		% ERR	DELTA-E
			ABUNDANCE(%)	RATE(CPM)		
XE-133	81.0	1.00E+00 +/- 1.51E-03	35.00	54650.01	0.2	0.4
KR-85M	149.5	1.08E-01 +/- 3.80E-04	74.00	12760.00	0.4	-1.4
KR-82		1.53E-01 +/- 8.15E-04				

KL ~~423~~ Gas 3  
4-23-83

196.1	1.53E-01	35.00	4480.02	0.5		
XL-133M 232.8	1.71E-02 +/- 1.64E-03 1.71E-02	14.00	1.00 272.94	9.6	-0.1	
XL-135 249.6	5.72E-01 +/- 8.01E-04 5.72E-01	72.00	1.03 57030.00	0.1	0.1	
KN-137 403.0	1.21E-01 +/- 8.02E-04 1.21E-01	50.00	1.24 3147.01	0.7	0.7	
XL-138 424.4	6.00E-02 +/- 1.19E-03 6.00E-02	40.00	2.57 651.54	2.0	0.1	
N-13 511.0	4.88E-02 +/- 1.05E-03 4.88E-02	123.00	4.94 556.94	2.2	0.2	
XL-138M 527.0	8.57E-02 +/- 1.09E-03 8.57E-02	80.00	2.73 1118.03	1.3	0.7	
AR-41 1293.6	6.38E-02 +/- 7.65E-04 6.38E-02	99.00	1.16 972.05	1.2	0.3	

UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
120.05	284.94	11.1
165.75	608.05	4.1
304.84	1106.05	1.5
329.65	54.55	24.8
357.15	102.34	11.7
362.15	402.84	3.2
390.25	110.14	11.0
395.84	358.74	3.6
408.65	304.44	4.0
413.14	105.75	11.2
462.64	135.74	7.6
471.64	41.44	23.8
590.65	22.74	40.2
608.05	582.95	2.1
614.35	113.05	8.6
673.85	72.05	12.1
744.65	20.04	36.5
788.25	18.84	39.8
813.05	21.44	34.3
834.65	631.84	1.7
845.25	188.74	4.6
862.35	36.95	19.8
897.85	200.74	4.1
945.35	27.64	24.6
985.35	38.94	19.5
1009.45	75.55	10.4
1039.35	25.14	28.1
1113.85	14.74	43.1
1141.25	50.25	12.9
1174.15	46.94	13.3
1179.95	34.45	17.9

DATA CTRL: PGM: 7-D

RC hig 3  
4-23-83  
Santi

AUTOMATIC ISOTOPE ANALYSIS

4/23/83 1522

SLM: FILE NO: 72

N.C. LIQUID ANALYSIS: 8 ML VIAL : 600 SEC : GAMMA ISOTOPIC

SPEC: FILE NO: ? LABEL ?

PRE LIG

SUBTRACT BUND TN

DATE SAMPLE WAS COLLECTED

MD: 74

DAY 223

YEAR 71983

TIME 71445

SAMPLE VOL OR WT: 71 PCC

TYPE HEADING

COLIGN

TYPE CORR (OR LT) TO START ?

SPEC: WRITTEN IN FILE 22 TAPE 28

RECEIVED

4/23/83 1534

SAMPLE COUNTING DATE 4/23/83 1523

SAMPLE COLLECTION DATE 4/23/83 1445

DECAY TIME 0 DAYS 38 MIN.

ACQ: LIVE TIME 10.0 MIN.

SAMPLE VOL./WT: 1.00E+00 CC/GR

FWHM FILE NO: 1

ENG: CALIB: FILE 1 LAST CALIB: CHECK 4/23/83

EFF FILE NO: 2 8 ML VIAL

AIA PK: SRCH: 7-A

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	64.0	2104	68015	17.7	1.5
2	80.7	224559	72508	0.3	1.4
3	120.3	1055	53382	31.1	1.7
4	136.2	6692	52833	5.0	1.7
5	150.9	43705	54816	0.9	1.7
6	165.8	3936	44999	7.8	1.7
7	196.0	23364	50250	1.5	1.7
8	220.1	1655	47609	18.8	1.8
9	227.4	1575	42468	18.7	1.8
10	234.3	2451	42189	12.0	1.8
11	249.5	245838	39195	0.2	1.8
12	283.5	2243	27767	10.7	1.9
13	288.4	4668	27476	5.2	1.9
14	304.9	4989	30758	5.2	1.9
15	344.1	14854	24617	1.7	2.2
16	395.6	757	22990	28.6	2.3

RC Hig 3  
4-23-83  
Santa

17	402.4	13272	22462	1.8	2.3
18	402.8	6590	22381	2.3	2.3
19	413.6	2316	21969	9.3	2.3
20	413.6	3522	20590	6.0	2.3
21	462.6	18310	20262	1.3	2.4
22	510.7	62322	22673	0.3	2.5
23	521.7	4946	24376	4.7	2.5
24	529.7	54201	20703	0.6	2.5
25	540.4	2482	15746	7.4	2.5
26	546.7	9547	16772	2.2	2.5
27	563.9	795	16302	23.3	2.6
28	569.7	872	16277	21.0	2.6
29	595.2	2831	16188	6.6	2.6
30	606.2	5275	16071	3.7	2.6
31	621.5	3615	15913	5.2	2.6
32	629.8	3506	15794	5.3	2.6
33	636.8	559	15690	32.0	2.6
34	661.1	3707	14688	5.5	2.6
35	667.6	23274	14256	1.0	2.6
36	677.2	2735	13701	6.3	2.6
37	706.7	938	11571	16.5	2.5
38	727.2	1620	9862	9.0	2.5
39	745.7	1372	9253	10.3	2.4
40	772.4	14544	9212	1.3	2.4
41	780.0	292	10188	49.2	2.4
42	795.7	1413	9132	9.8	2.3
43	812.0	1505	8569	9.1	2.3
44	835.5	4267	8575	3.4	2.3
45	846.8	20682	8257	0.9	2.2
46	856.8	501	8905	27.0	2.2
47	872.5	2779	7942	4.9	2.2
48	883.9	12835	7062	1.3	2.2
49	897.8	4060	6488	3.2	2.2
50	947.4	1166	6165	10.0	2.1
51	954.3	2529	6152	4.8	2.1
52	973.6	1266	6270	9.3	2.1
53	985.3	522	5925	21.3	2.1
54	996.0	327	5299	45.8	2.1
55	1009.4	2468	6136	1.7	2.1
56	1031.6	1398	5295	7.8	2.1
57	1038.7	2628	5213	4.3	2.1
58	1051.8	270	4908	37.2	2.0
59	1072.4	2447	5386	4.7	2.0
60	1101.3	601	4686	16.6	2.0
61	1123.7	877	4569	11.4	2.0
62	1131.1	5760	4468	2.1	2.0
63	1136.6	2549	4382	4.2	2.0
64	1142.4	602	4310	16.0	2.0
65	1146.9	720	4238	13.3	2.0
66	1168.5	230	4338	41.0	2.0
67	1173.7	213	4386	44.5	2.0
68	1195.6	228	4362	41.5	2.0
69	1248.2	845	3640	10.7	2.1
70	1260.1	6639	3373	1.7	2.1
71	1293.2	3491	3385	2.9	2.2
72	1299.0	1086	2907	7.6	2.2
73	1324.8	303	2641	24.7	2.2
74	1368.5	3091	2640	3.0	2.3



RC hig 3

4-23-83

Santi

75	1397.4	312	2486	34.0	2.3
76	1398.2	772	2521	9.9	2.3
77	1435.5	14298	3105	1.0	2.3
78	1457.1	1918	2390	4.3	2.3
79	1467.5	201	2241	34.0	2.3
80	1503.4	249	2172	27.2	2.3
81	1529.5	907	2242	7.4	2.3
82	1566.0	250	2135	26.9	2.3
83	1613.3	494	1808	13.2	2.4
84	1655.9	123	1465	41.6	2.4
85	1677.6	1724	1589	4.3	2.4
86	1684.9	169	1678	35.1	2.4
87	1706.1	990	1364	6.7	2.4
88	1731.2	486	1346	11.6	2.4
89	1740.9	354	1484	16.3	2.4
90	1767.8	230	1366	22.9	2.4
91	1790.8	1494	1336	4.3	2.4
92	1806.4	600	1206	9.1	2.4
93	1835.6	3332	1355	2.3	2.4
94	1880.5	226	1138	22.1	2.4
95	1897.4	301	1054	16.3	2.5
96	1918.9	156	2315	44.4	3.6

AIA ACT: CALC 7-D

## RC IODINES

NUCLIDE	8 ML VIAL	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
I-121	2.86E-02 +/- 4.86E-04	1.00			
364.5	2.86E-02	82.00	1485.02	1.7	0.3
I-122	9.06E-02 +/- 4.35E-03	1.24			
954.6	9.06E-02	16.70	252.93	4.8	0.2
I-123	1.43E-01 +/- 8.19E-04	1.02			
529.9	1.43E-01	89.00	5420.02	0.6	0.1
975.5		4.40			
I-124	1.52E-01 +/- 1.93E-03	1.76			
884.1	1.52E-01	66.00	1283.03	1.3	0.1
I-125	1.29E-01 +/- 2.25E-03	1.08			
1220.5	1.29E-01	34.90	663.94	1.7	0.2

REG GUIDE 1.21

XE-133	4.38E-01 +/- 1.18E-03	1.00			
91.0	4.38E-01	35.00	22450.00	0.3	0.3
CO-57	7.45E-04 +/- 2.32E-04	1.00			
121.9	7.45E-04	87.00	105.50	31.1	1.4
MO-99	***NOT IDENTIFIED***	1.00			
140.5	(< 5.22E-05)	360.01			
CE-141	***NOT IDENTIFIED***	1.00			



RC hig 3

4-23-83

Sante

145.4	( $\leq 3.72E-04$ )	42.00				
UN-117M ***NOT IDENTIFIED***		1.00				
150.4	( $\leq 3.11E-04$ )	87.00				
XL-132	$2.97E-01 \pm 6.81E-04$	1.03				
249.4	$2.97E-01$	92.00	24900.02	0.2	0.0	
UR-51 ***NOT IDENTIFIED***		1.00				
320.1	( $\leq 3.14E-03$ )	9.80				
I-131 MAJOR PEAK MISSING		1.00				
244.5*	$0.00E+00$	82.00	0.05	---	0.2	
I-132 MAJOR PEAK MISSING		1.02				
529.9*	$0.00E+00$	89.00	0.05	---	0.1	
BO-140 ***NOT IDENTIFIED***		1.00				
527.3	( $\leq 9.95E-04$ )	34.00				
REG GUIDE 1.21						
BU-103 ***NOT IDENTIFIED***		1.00				
497.1	( $\leq 3.57E-04$ )	90.00				
CO-137	$1.18E-02 \pm 6.44E-04$	1.00				
441.6	$1.18E-02$	84.00	330.74	5.5	0.4	
ZR-95 ***NOT IDENTIFIED***		1.00				
754.7	( $\leq 6.86E-04$ )	54.60				
MB-95	$5.12E-03 \pm 5.26E-04$	1.00				
745.0	$5.12E-03$	99.00	37.24	10.3	0.0	
CS-134	$6.32E-03 \pm 6.19E-04$	1.00				
799.0	$6.32E-03$	80.00	143.32	9.8	0.0	
CO-52	$6.06E-03 \pm 5.49E-04$	1.00				
010.4	$6.06E-03$	99.00	150.53	9.1	-1.4	
MM-54	$1.76E-02 \pm 6.03E-04$	1.00				
034.0	$1.76E-02$	100.00	426.74	3.4	-0.7	
CS-136 ***NOT IDENTIFIED***		1.00				
1048.1	( $\leq 5.31E-04$ )	80.50				
FE-59	$5.92E-03 \pm 9.84E-04$	1.00				
1099.3	$5.92E-03$	56.50	60.14	16.6	-2.1	
ZN-45 ***NOT IDENTIFIED***		1.00				
1115.4	( $\leq 8.83E-04$ )	49.00				
REG GUIDE 1.21						
CO-40	$1.26E-03 \pm 5.62E-04$	1.00				
1173.2	$1.26E-03$	100.00	21.34	44.5	-0.4	
LA-140 ***NOT IDENTIFIED***		1.00				

1594.2 3.73E-04 94.50  
 UP 124 \*\*\*NOT IDENTIFIED\*\*\* 1.00  
 1291.0 7.45E-04 45.70  
 CS 132 2.03E-01 +/- 3.45E-01 2.49  
 1008.4 2.03E-01 55.00 846.03 1.00

le hg 3  
 4-23-83  
 Sante

UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
64.05	210.44	17.7
136.36	669.25	5.0
151.04	4370.04	0.9
165.05	393.64	7.0
196.14	2336.04	4.8
220.25	163.84	10.0
227.64	157.84	10.7
234.44	245.14	12.0
292.75	224.34	10.7
208.63	466.04	5.2
305.15	493.94	5.8
395.75	73.75	20.8
402.54	1327.05	4.0
408.95	639.05	4.4
417.45	231.64	9.3
433.75	352.84	6.0
462.73	1361.05	1.3
510.84	6232.04	0.5
521.05	494.64	4.7
540.55	248.24	7.4
546.05	954.05	2.0
564.05	78.55	23.3
569.85	87.25	21.0
595.35	283.14	6.6
606.35	527.55	3.7
621.65	361.54	5.2
629.95	130.64	8.3
636.95	55.94	32.0
667.75	2327.04	1.0
677.35	273.84	6.5
706.05	93.84	16.5
727.35	162.04	9.0
772.55	1454.05	1.2
780.15	29.24	49.2
846.95	2068.04	0.9
856.95	50.15	27.0
872.65	277.94	4.9
897.95	406.04	3.2
947.55	116.64	10.0
973.75	126.64	9.3
985.45	52.25	21.3
996.15	22.74	45.8
1031.75	139.84	7.8
1038.95	262.84	4.3
1052.05	27.04	37.2
1072.65	244.74	4.7

QA Record

TEMPERATURE RETENTION

for 5-3 until 1-1-89  
in Date 4-26-83

CMP-4,52-2

FC-340

RJ 8-11-82

1 OF 2

RC-GAS

4-24-83

#8

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.24.1983

SAMPLE TIME 144

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 1.06E+00 UCI/CC

KR-85M = 1.08E-01 UCI/CC

KR-88 = 1.50E-01 UCI/CC

XE-133M = 1.66E-02 UCI/CC

XE-135 = 5.95E-01 UCI/CC

KR-87 = 1.22E-01 UCI/CC

XE-138 = 5.96E-02 UCI/CC

N-13 = 4.04E-02 UCI/CC

XE-135M = 7.34E-02 UCI/CC

AR-41 = 6.32E-02 UCI/CC

TOT GAS = 2.29E+00 UCI/CC

H2 CONC. IN CC/KG = 31.1

CMP-4.52-3  
FC-340  
P1 8-11-82  
1 OF 2

RC-GAS  
4-24-83

LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $4.55E-01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $9.85E-01$  UCI/CC

3. DEGAS FACTORS

C.F. = .61609 D.F. = .57150 T.D.F. = .9276

4. HYDROGEN INPUTS

STD DIVISIONS AT 32 ATTN. = 186.00

H2 SAMPLE DIVISIONS AT 8 ATTN. = 37.50

5. GAS ACTIVITY INPUTS

KR-85M =  $1.00E-01$  UCI/CC

KR-88 =  $1.39E-01$  UCI/CC

XE-133M =  $1.54E-02$  UCI/CC

XE-135 =  $5.52E-01$  UCI/CC

KR-87 =  $1.13E-01$  UCI/CC

XE-138 =  $5.53E-02$  UCI/CC

N-13 =  $3.75E-02$  UCI/CC

XE-135M =  $6.81E-02$  UCI/CC

-41 =  $5.86E-02$  UCI/CC

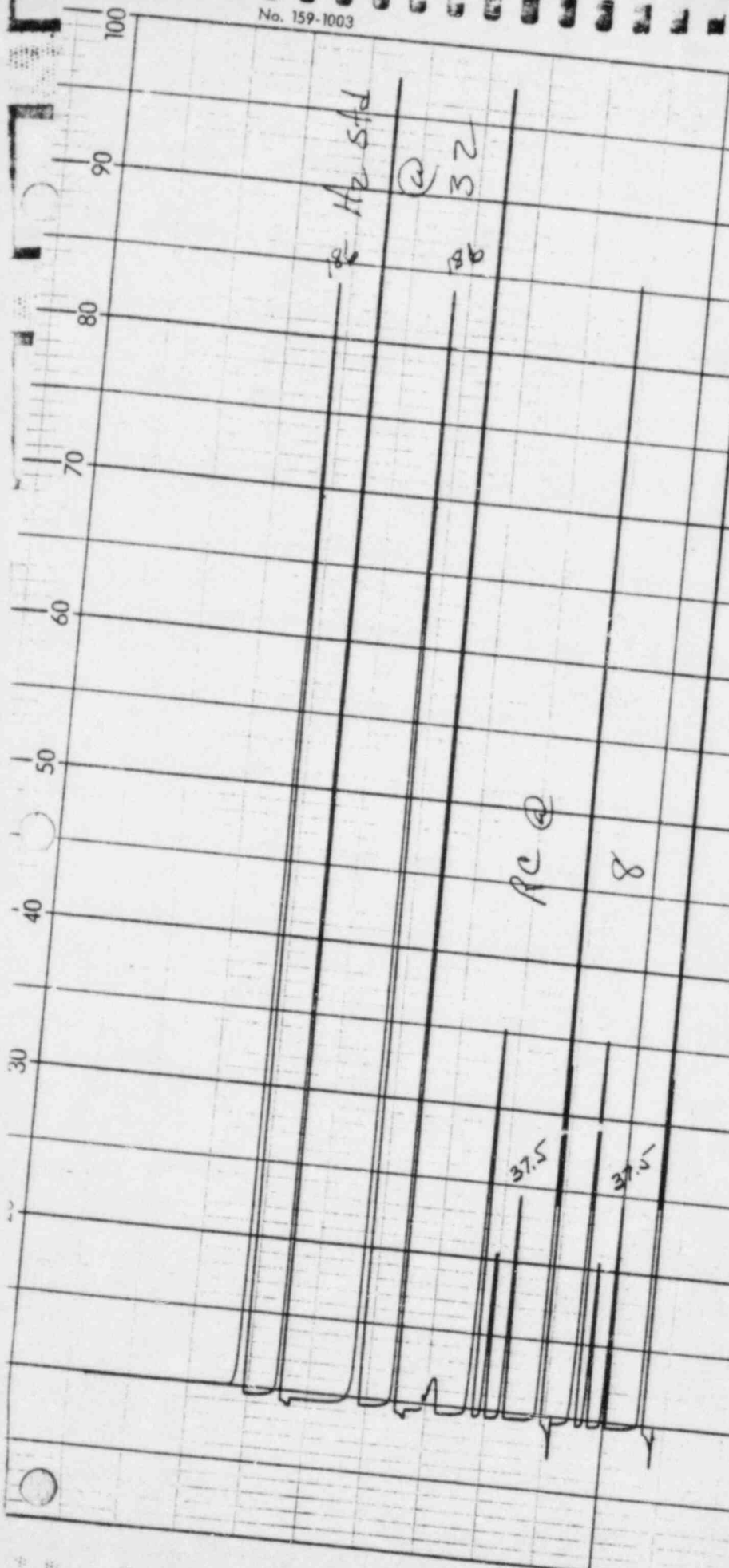
RC-GAS

4-24-83

QA Record  
TEMPORARY RETENTION

for 5 years until 1-1-89

Initials: AS Date: 4-26-83





RC-GAS  
4-24-83

\*X 0

DATA CTRL: PUM, 7-D'

AUTOMATIC ISOTOPE ANALYSIS

4/24/83

156

SEQ. FILE NO: 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL : 600 SEC

SPEC. FILE NO.? LABEL ?

TRC GAS

SUBTRACT BOND ?N.

DATE SAMPLE WAS COLLECTED

NO. 74

DAY 724

YEAR 71993

TIME 70144

SAMPLE VOL:OR MT: 71 7CC

TYPE HEADING

RC GAS

TYPE [CR] (OR LT) TO START ?

SPEC. WRITTEN IN FILE 24 TAPE 20

QA Record

TEMPORARY RETENTION

for 5 years until 1-1-89

Initials: [Signature] 4-26-83

RC GAS

4/24/83

207

SAMPLE COUNTING DATE 4/24/83 156

SAMPLE COLLECTION DATE 4/24/83 144

DECAY TIME 0 DAYS 12 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./MT: 1.00E+00 CC/GR

FMHM FILE NO: 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/24/83

EFF FILE NO: 3 5 CC VIAL

AIA PK: SRCH: 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FMHM
1	63.7	1091	90319	39.1	1.5
2	80.7	534371	82736	0.2	1.6
3	120.8	2144	47233	14.5	1.7
4	150.9	119726	40290	0.4	1.7
5	165.8	1567	31567	16.2	1.7
6	196.0	60398	27430	0.6	1.7
7	233.0	2467	32899	10.6	1.8
8	249.5	533790	28758	0.1	1.8
9	304.6	10512	8978	1.6	1.9
10	329.6	397	8021	32.3	2.0
11	362.0	3748	6594	3.5	2.2
12	390.1	1123	6471	10.6	2.3
13	395.8	3883	6291	3.3	2.3



RC-GAS  
4-24-83

14	402.2	31448	4039	0.7	2.3
15	408.3	3326	3923	3.7	2.3
16	434.2	7763	5062	1.7	2.3
17	455.2	529	4510	12.3	2.4
18	462.3	1453	4450	7.0	2.4
19	471.5	550	4372	17.5	2.4
20	498.7	321	4269	31.2	2.4
21	510.7	5629	4025	1.9	2.5
22	526.3	11702	4401	1.2	2.5
23	546.9	289	4089	32.0	2.5
24	607.9	5792	4077	2.0	2.6
25	673.9	473	3501	18.3	2.6
26	731.1	165	2763	45.7	2.6
27	747.7	147	2425	48.1	2.4
28	789.3	207	2574	35.4	2.3
29	813.4	220	2526	33.0	2.3
30	834.6	5987	2424	1.8	2.3
31	845.2	1894	2547	4.4	2.2
32	861.9	218	2241	31.5	2.2
33	897.8	1450	2275	5.3	2.2
34	905.3	379	2520	19.4	2.1
35	1009.2	675	2242	10.6	2.1
36	1076.2	148	2174	45.3	2.0
37	1141.1	530	1750	12.0	2.0
38	1174.0	584	1540	10.4	2.0
39	1179.6	390	1566	14.9	2.0
40	1184.8	222	1587	24.3	2.0
41	1243.9	163	1467	34.2	2.1
42	1250.4	410	1449	14.6	2.1
43	1293.2	9284	1930	1.2	2.2
44	1337.9	132	1304	39.7	2.3
45	1369.6	1395	1512	4.8	2.3
46	1380.1	120	1365	44.5	2.3
47	1422.9	137	1339	38.7	2.3
48	1435.5	1284	1326	4.9	2.3
49	1518.1	443	1566	13.5	2.2
50	1529.5	2484	1665	3.1	2.3
51	1684.9	316	1383	17.6	2.4
52	1740.0	311	1394	17.9	2.4
53	1767.7	1151	1413	5.5	2.4
54	1835.6	1179	1257	5.2	2.4
55	1850.5	127	1123	38.4	2.4
56	1880.7	719	1177	7.7	2.4

AIA ACT. CALC 7-D

RC GASES

NUCLIDE	UUCI/CC	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	9.85E-01 +/- 1.47E-03		1.00		
81.0	9.85E-01	35.00	53430.01	0.2	0.3
95M	1.00E-01 +/- 3.71E-04		1.05		
149.5	1.00E-01	74.00	11970.00	0.4	-1.5
KR-88	1.39E-01 +/- 7.82E-04		1.07		

RC-GAS  
4-24-83

196.1	1.39E-01	35.00	4038.04	0.6	-0.0
XB-133H 232.0	1.54E-02 +/- 1.63E-03 1.54E-02	14.00	246.72	10.6	-0.4
XD-135 249.4	5.52E-01 +/- 7.72E-04 5.52E-01	92.00	53370.01	0.1	-0.1
KR-87 403.0	1.13E-01 +/- 7.51E-04 1.13E-01	50.00	3144.01	0.7	0.5
XD-138 424.4	5.53E-02 +/- 9.51E-04 5.53E-02	48.00	776.34	1.7	-0.0
N-13 511.0	3.75E-02 +/- 7.20E-04 3.75E-02	123.00	662.94	1.9	0.0
YE-135H 527.0	6.81E-02 +/- 8.32E-04 6.81E-02	80.00	1170.03	1.2	0.4
AK-41 1293.6	5.84E-02 +/- 7.20E-04 5.84E-02	99.00	928.03	1.2	0.0

UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE(CPM)	% ERR
63.75	109.14	39.1
121.15	214.44	14.5
146.04	156.74	14.2
304.25	1051.05	1.6
329.25	39.75	32.3
362.24	374.84	3.5
390.45	112.34	10.6
396.15	388.34	3.3
408.84	332.64	3.7
455.54	52.94	18.5
462.84	145.34	7.0
471.84	55.05	17.5
499.04	32.15	31.2
547.05	28.84	32.0
608.15	579.25	2.0
674.15	47.34	18.3
731.35	16.54	45.7
747.95	14.74	48.1
788.55	20.74	35.4
813.65	22.04	33.0
834.85	598.75	1.8
845.45	188.44	4.4
862.15	21.84	31.5
898.05	145.04	5.3
985.55	37.95	19.4
1009.45	67.55	10.6
1076.55	14.84	45.3
1141.45	53.05	12.0
1174.35	58.44	10.4
1179.95	39.94	14.9
1185.15	22.24	26.2

QA Record

TEMPORARY ATTENTION

for 5-1-81 until 1-1-81  
In Date 4-26-83

CMP-4.52-2

FC-340

R1 8-11-82

1 OF 2

RC-GAS  
4-24-83

#8

FORT CALHOUN STATION UNIT NO. 1  
REACTOR COOLANT GASEOUS ACTIVITY

DATE 4.24.1983

SAMPLE TIME 144

SAMPLE TEMP = 120 °F

DENSITY GM/ML = .98856

XE-133 = 1.06E+00 UCI/CC

KR-85M = 1.08E-01 UCI/CC

KR-88 = 1.50E-01 UCI/CC

XE-133M = 1.66E-02 UCI/CC

XE-135 = 5.95E-01 UCI/CC

KR-87 = 1.22E-01 UCI/CC

XE-138 = 5.96E-02 UCI/CC

N-13 = 4.04E-02 UCI/CC

XE-135M = 7.34E-02 UCI/CC

AR-41 = 6.32E-02 UCI/CC

TOT GAS = 2.29E+00 UCI/CC

H2 CONC. IN CC/KG = 31.1

CMP-4.52-3  
FC-340  
R1 8-11-82  
1 OF 2

RC-GAS  
4-24-83

LIQUID DEGASSED SAMPLE

XE-133 CONCENTRATION =  $4.55E-01$  UCI/GR

2. GAS SAMPLE

XE-133 CONCENTRATION =  $9.85E-01$  UCI/CC

3. DEGAS FACTORS

C.F. = .61609 D.F. = .57150 T.D.F. = .9276

4. HYDROGEN INPUTS

STD DIVISIONS AT 32 ATTN. = 186.00

H2 SAMPLE DIVISIONS AT 8 ATTN. = 37.50

5. GAS ACTIVITY INPUTS

KR-85M =  $1.00E-01$  UCI/CC

KR-88 =  $1.39E-01$  UCI/CC

XE-133M =  $1.54E-02$  UCI/CC

XE-135 =  $5.52E-01$  UCI/CC

KR-87 =  $1.13E-01$  UCI/CC

XE-138 =  $5.53E-02$  UCI/CC

N-13 =  $3.75E-02$  UCI/CC

XE-135M =  $6.81E-02$  UCI/CC

-41 =  $5.86E-02$  UCI/CC

RC-GAS

4-24-83

QA Record  
TEMPORARY RETENTION

for 5 years until 1-1-84

Initials: *[Signature]* Date: 4-26-83





RC-GAS

4-24-83

CHIAA CTRL: PCM: 7-D/

AUTOMATIC ISOTOPE ANALYSIS

4/24/83 154

REQ. FILE NO: 71

REACTOR COOLANT GAS ANALYSIS: 5 CC VIAL 1 600 SEC

SPEC. FILE NO. 7 LABEL 7

TRC GAS

SUBTRACT BOND 7N.

DATE SAMPLE WAS COLLECTED

MO: 74

DAY 724

YEAR 71983

TIME 70144

SAMPLE VOL: OR WT: 71 700

TYPE HEADING

RC GAS

TYPE (CR) (OR LT) TO START 7

SPEC. WRITTEN IN FILE 24 TAPE 20

QA Record

TEMPORARY RETENTION

for 5 years until 1-1-89

Initials: *[Signature]* 4-26-83

RC GAS

4/24/83

207

SAMPLE COUNTING DATE 4/24/83 154

SAMPLE COLLECTION DATE 4/24/83 144

DECAY TIME 0 DAYS 12 MIN.

ACQ. LIVE TIME 10.0 MIN.

SAMPLE VOL./WT. 1.00E+00 CC/GR

FWHM FILE NO: 1

ENG. CALIB. FILE 1 LAST CALIB. CHECK 4/24/83

EFF FILE NO: 3 5 CC VIAL

AIA PK: SRCH: 7-A'

NO.	CENTROID	NET INTG.	BKGD.	% ERROR	FWHM
1	63.7	1091	90319	39.1	1.5
2	80.7	534371	82736	0.2	1.6
3	120.8	2144	47233	14.5	1.7
4	150.9	119726	40290	0.4	1.7
5	165.8	1567	31567	16.2	1.7
6	196.0	60388	27430	0.6	1.7
7	233.0	2467	32899	10.6	1.8
8	249.5	533790	28758	0.1	1.8
9	304.6	10512	8978	1.6	1.9
10	329.6	397	8021	32.3	2.0
11	362.0	3748	6594	3.5	2.2
12	390.1	1123	6471	10.6	2.3
13	395.8	3883	6291	3.3	2.3



RC-GAS

4-24-83

14	402.2	31448	6039	0.7	2.3
15	408.5	3328	5923	3.7	2.2
16	434.2	7767	5062	1.7	2.3
17	458.2	539	4510	13.5	2.4
18	462.5	1452	4450	7.0	2.4
19	471.5	550	4372	17.5	2.4
20	498.7	321	4069	31.3	2.4
21	510.7	6629	4025	1.9	2.5
22	526.3	11702	4401	1.2	2.5
23	546.8	288	4089	32.0	2.5
24	607.9	5792	4077	2.0	2.6
25	673.9	473	3501	19.3	2.6
26	731.1	165	2763	45.7	2.5
27	747.7	147	2425	48.1	2.4
28	788.3	207	2574	33.4	2.3
29	813.4	220	2526	37.0	2.3
30	834.6	5987	2624	1.8	2.3
31	845.2	1884	2547	4.4	2.2
32	861.9	218	2241	31.5	2.2
33	897.8	1450	2275	5.3	2.2
34	985.3	379	2520	19.4	2.1
35	1009.2	675	2242	10.6	2.1
36	1076.2	140	2174	45.3	2.0
37	1141.1	530	1750	12.0	2.0
38	1174.0	584	1540	10.4	2.0
39	1179.6	399	1566	14.9	2.0
40	1184.8	222	1587	26.3	2.0
41	1243.9	163	1467	34.2	2.1
42	1250.4	410	1649	14.6	2.1
43	1293.2	9284	1930	1.2	2.2
44	1337.9	132	1304	39.7	2.3
45	1369.6	1395	1512	4.8	2.3
46	1382.1	120	1365	44.5	2.3
47	1422.9	137	1339	38.7	2.3
48	1435.5	1284	1326	4.9	2.3
49	1518.1	443	1566	13.5	2.3
50	1529.5	2484	1665	3.1	2.3
51	1684.9	316	1383	17.6	2.4
52	1740.0	311	1394	17.9	2.4
53	1767.7	1151	1413	5.5	2.4
54	1835.6	1179	1257	5.2	2.4
55	1850.3	127	1123	38.4	2.4
56	1880.7	719	1177	7.7	2.4

AIA ACT: CALC 7-D

RC GASES

NUCLIDE	UUCI/CC	DECAY CORR.			
ENERGY		ABUNDANCE(%)	RATE(CPM)	% ERR	DELTA-E
XE-133	9.85E-01 +/- 1.47E-03	1.00			
81.0	9.85E-01	35.00	53430.01	0.2	0.3
BSM	1.00E-01 +/- 3.71E-04	1.05			
149.5	1.00E-01	74.00	11970.00	0.4	-1.5
KR-88	1.39E-01 +/- 7.82E-04	1.07			

RC-GAS  
4-24-83

196.1	1.39E-01	35.00	6032.04	0.6	-0.0
XL-137M 242.9	1.54E-02 +/- 1.63E-03 1.54E-02	14.00	1.00 246.72	10.6	-0.4
XL-138 249.4	5.52E-01 +/- 7.72E-04 5.52E-01	92.00	1.02 53370.01	0.1	-0.1
KN-87 403.0	1.13E-01 +/- 7.51E-04 1.13E-01	50.00	1.17 3844.01	0.7	0.5
XL-139 424.4	5.53E-02 +/- 9.51E-04 5.53E-02	40.00	1.99 776.34	1.7	-0.0
N-12 511.0	3.75E-02 +/- 7.20E-04 3.75E-02	123.00	3.18 662.94	1.9	0.0
XL-135M 527.0	6.81E-02 +/- 8.32E-04 6.81E-02	80.00	2.07 1170.03	1.2	0.4
KN-41 1293.4	5.86E-02 +/- 7.20E-04 5.86E-02	99.00	1.11 928.03	1.2	0.0

# UNIDENTIFIED PHOTOPEAKS

ENERGY	RATE (CPM)	% ERR
62.75	109.14	39.1
121.15	214.44	14.5
146.04	156.74	16.2
304.95	1051.05	1.6
329.95	39.75	32.3
362.34	374.84	3.5
390.45	112.34	10.6
396.15	388.34	3.3
408.04	332.64	3.7
455.54	52.94	18.5
462.04	145.34	7.0
471.04	55.05	17.5
499.04	32.15	31.2
547.05	28.84	32.0
608.15	579.25	2.0
674.15	47.34	18.3
731.35	16.54	45.7
747.95	14.74	48.1
788.55	20.74	35.4
813.65	22.04	33.0
834.85	598.75	1.8
845.45	188.44	4.4
862.15	21.84	31.5
898.05	145.04	5.3
985.55	37.95	19.4
1009.45	67.55	10.6
1076.55	14.84	45.3
1141.45	53.05	12.0
1174.35	58.44	10.4
1179.95	39.94	14.9
1185.15	22.24	26.2