



Entergy Operations

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February 28, 1992

2CAN029206

U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NFP-6
Annual Report For the Activity
of the Primary Coolant - 1991

Gentlemen:

Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specification 6.9.1.5.e requires an annual submittal of the results of the specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The specific activity of the primary coolant, as required by Specification 3.4.8, shall be limited to a) less than or equal to 1.0 microcurie per gram DOSE EQUIVALENT I-131, and b) less than or equal to 100/1E (Average Disintegration Energy) microcuries per gram. The purpose of this letter is to provide this information for 1991.

The limits of Specification 3.4.8 were exceeded on October 9, 1991 at 2000 hours. ANO-2 primary coolant exceeded this limit for approximately eight hours. The cause for exceeding the limit is a failed fuel pin in the Cycle 9 core.

Radiochemistry data recorded over Cycle 9 shows that RCS concentration of I-131 decreased over the period from early July until late August, when it appeared to "stabilize". This period corresponds with a long run of steady full power operation for ANO-2. It is known that fuel pellets will thermally expand more than the pin cladding and will also swell under operation, closing the gap between the pellets and the inner surface of the fuel pin cladding. ANO believes that during this long run at steady power, the swelling of the fuel pellets closed off much of the free path available for fission products and their daughter fission products exit the fuel pin through the defect. This effect was further enhanced by the apparently small size of the defect. Although the amount of radioisotopes entering the RCS declined over this time, the amount being produced was not declining and was being stored up within the defective fuel pin. When the reactor was shutdown on October 9, 1991, the fuel pellets thermally contracted, opening up the gap area and allowing this inventory of radioisotopes to exit the fuel pin.

9203050294 920228
PDR ADOCK 03000368
R PDR

A001
111

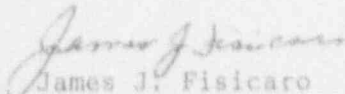
The coolant activity reached a maximum of 1.342 microcuries per milliliter (gram).

The following attachments provide the information as requested by Technical Specification 5.9.1.5.e:

- Attachment 1 provides the reactor power history starting 48 hours prior to the first sample in which the limit was exceeded.
- The results of the last isotopic analysis for radiiodine performed prior to exceeding the limit, the results of the analysis while the limit was exceeded, and the results of one analysis when the activity was reduced below the limits are provided in Attachment 2.
- The history of the letdown system flow is in Attachment 3. This history started 48 hours prior to the first sample exceeding the limit.
- Attachment 4 includes graphs of I-131 and I-132 concentration as a function of time for the duration of the specific activity was above steady state levels.

This letter completes the annual 1991 reporting requirements for Technical Specification 6.9.1.5.e. Should you have any questions regarding this submittal, please contact me.

Very truly yours,


James J. Fisicaro
Director, Licensing

JJF/RWC/jt

Attachments

cc: Mr. Robert Martin
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ATTACHMENT 1

REACTOR POWER HISTORY

| DAY 07-Oct-91 | ENTER EFPD | DELTA EFPD | ANO UNIT TWO CALCULATED RX POWER | CORRECT RX POWER | CORRECTED EFPD | EFPD CORRECTION |
|------------------|---------------|---------------|--|---------------------|-------------------|--------------------|
| 0000 | 163.5789 | | | | | |
| | | 0.0396 | 95.04 | 99.912 | 0.04163 | 0.00203 |
| 0100 | 163.6185 | | | | | |
| | | 0.04166 | 99.984 | NA | 0 | 0 |
| 0200 | 163.6601 | | | | | |
| | | 0.04162 | 99.888 | NA | 0 | 0 |
| 0300 | 163.7018 | | | | | |
| | | 0.04126 | 99.024 | 99.912 | 0.04163 | 0.00037 |
| 0400 | 163.7430 | | | | | |
| | | 0.04163 | 99.912 | NA | 0 | 0 |
| 0500 | 163.7847 | | | | | |
| | | 0.04161 | 99.864 | NA | 0 | 0 |
| 0600 | 163.8263 | | | | | |
| | | 0.04164 | 99.936 | NA | 0 | 0 |
| 0700 | 163.8679 | | | | | |
| | | 0.04164 | 99.936 | NA | 0 | 0 |
| 0800 | 163.9095 | | | | | |
| | | 0.0417 | 100.08 | NA | 0 | 0 |
| 0900 | 163.9512 | | | | | |
| | | 0.04163 | 99.912 | NA | 0 | 0 |
| 1000 | 163.9929 | | | | | |
| | | 0.0417 | 100.08 | NA | 0 | 0 |
| 1100 | 164.0346 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 1200 | 164.0762 | | | | | |
| | | 0.04126 | 99.024 | 99.936 | 0.04164 | 0.00038 |
| 1300 | 164.1175 | | | | | |
| | | 0.04171 | 100.104 | NA | 0 | 0 |
| 1400 | 164.1592 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 1500 | 164.2009 | | | | | |
| | | 0.04164 | 99.936 | NA | 0 | 0 |
| 1600 | 164.2425 | | | | | |
| | | 0.04164 | 99.936 | NA | 0 | 0 |
| 1700 | 164.2842 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 1800 | 164.3258 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 1900 | 164.3675 | | | | | |
| | | 0.04164 | 99.936 | NA | 0 | 0 |
| 2000 | 164.4091 | | | | | |
| | | 0.04133 | 99.192 | 99.912 | 0.04163 | 0.0003 |
| 2100 | 164.4505 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 2200 | 164.4921 | | | | | |
| | | 0.04165 | 99.96 | NA | 0 | 0 |
| 2300 | 164.5338 | | | | | |
| | | 0.04169 | 100.056 | NA | 0 | 0 |
| 0000 | 164.5755 | | | | | |

TOTAL RX POWER = 99.66

RX POWER CORRECTIONS = 0.308

CORRECTED RX POWER = 99.968

| DAY 08-Oct-91 | ENTER EFPD | DELTA EFPD | ANO UNIT TWO CALCULATED RX POWER | CORRECT RX POWER | CORRECTED EFPD | EFPD CORRECTION |
|------------------|---------------|---------------|--|---------------------|-------------------|--------------------|
| 0000 | 164.5755 | | | | | |
| 0100 | 164.6171 | 0.04161 | 99.864 | NA | 0 | 0 |
| 0200 | 164.6587 | 0.04164 | 99.936 | NA | 0 | 0 |
| 0300 | 164.7003 | 0.04161 | 99.864 | NA | 0 | 0 |
| 0400 | 164.7416 | 0.04126 | 99.024 | 99.912 | 0.04163 | 0.00037 |
| 0500 | 164.7833 | 0.04171 | 100.104 | NA | 0 | 0 |
| 0600 | 164.825 | 0.04164 | 99.936 | NA | 0 | 0 |
| 0700 | 164.8666 | 0.04162 | 99.898 | NA | 0 | 0 |
| 0800 | 164.9083 | 0.04172 | 100.128 | NA | 0 | 0 |
| 0900 | 164.9499 | 0.04164 | 99.936 | NA | 0 | 0 |
| 1000 | 164.9916 | 0.04164 | 99.936 | NA | 0 | 0 |
| 1100 | 165.0332 | 0.04167 | 100.008 | NA | 0 | 0 |
| 1200 | 165.0745 | 0.04128 | 99.072 | 99.836 | 0.041598 | 0.0003183 |
| 1300 | 165.1162 | 0.04169 | 100.056 | NA | 0 | 0 |
| 1400 | 165.1579 | 0.04164 | 99.936 | NA | 0 | 0 |
| 1500 | 165.1995 | 0.04162 | 99.888 | NA | 0 | 0 |
| 1600 | 165.2412 | 0.04171 | 100.104 | NA | 0 | 0 |
| 1700 | 165.2828 | 0.04165 | 99.96 | NA | 0 | 0 |
| 1800 | 165.3245 | 0.04169 | 100.056 | NA | 0 | 0 |
| 1900 | 165.3662 | 0.04166 | 99.984 | NA | 0 | 0 |
| 2000 | 165.4078 | 0.04162 | 99.888 | NA | 0 | 0 |
| 2100 | 165.4491 | 0.04129 | 99.096 | 99.836 | 0.041598 | 0.0003083 |
| 2200 | 165.4908 | 0.04167 | 100.008 | NA | 0 | 0 |
| 2300 | 165.5324 | 0.04168 | 100.032 | NA | 0 | 0 |
| 0000 | 165.5741 | 0.04167 | 100.008 | NA | 0 | 0 |

TOTAL RX POWER = 99.863

RX POWER CORRECTIONS = 0.099666

CORRECTED RX POWER = 99.96266

| DAY 09-Oct-91 HOUR | ENTER EFPD | DELTA EFPD | ANO UNIT TWO CALCULATED RX POWER | CORRECT RX POWER | CORRECTED EFPD | EFPD CORRECTION |
|--------------------------|---------------|---------------|--|---------------------|-------------------|--------------------|
| 0000 | 165.5741 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 0100 | 165.6158 | | | | | |
| | | 0.04166 | 99.984 | NA | 0 | 0 |
| 0200 | 165.6574 | | | | | |
| | | 0.04119 | 98.856 | 99.77 | 0.041570 | 0.0003808 |
| 0300 | 165.6986 | | | | | |
| | | 0.04162 | 99.888 | NA | 0 | 0 |
| 0400 | 165.7403 | | | | | |
| | | 0.04168 | 100.032 | NA | 0 | 0 |
| 0500 | 165.7819 | | | | | |
| | | 0.04164 | 99.936 | NA | 0 | 0 |
| 0600 | 165.8236 | | | | | |
| | | 0.04169 | 100.056 | NA | 0 | 0 |
| 0700 | 165.8653 | | | | | |
| | | 0.04166 | 99.984 | NA | 0 | 0 |
| 0800 | 165.9069 | | | | | |
| | | 0.04165 | 99.96 | NA | 0 | 0 |
| 0900 | 165.9486 | | | | | |
| | | 0.04171 | 100.104 | NA | 0 | 0 |
| 1000 | 165.9903 | | | | | |
| | | 0.04127 | 99.048 | 99.936 | 0.04164 | 0.00037 |
| 1100 | 166.0316 | | | | | |
| | | 0.04169 | 100.056 | NA | 0 | 0 |
| 1200 | 166.0732 | | | | | |
| | | 0.04165 | 99.96 | NA | 0 | 0 |
| 1300 | 166.1149 | | | | | |
| | | 0.0416 | 99.84 | NA | 0 | 0 |
| 1400 | 166.1565 | | | | | |
| | | 0.04167 | 100.008 | NA | 0 | 0 |
| 1500 | 166.1982 | | | | | |
| | | 0.04041 | 96.984 | NA | 0 | 0 |
| 1600 | 166.2386 | | | | | |
| | | 0.02733 | 65.592 | NA | 0 | 0 |
| 1700 | 166.2659 | | | | | |
| | | 0.01342 | 32.208 | NA | 0 | 0 |
| 1800 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1900 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2000 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2100 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2200 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2300 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0000 | 166.2793 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |

TOTAL RX POWER = 70.521

RX POWER CORRECTIONS = 0.075083

CORRECTED RX POWER = 70.59608

| DAY 10-Oct-91 HOUR | ENTER EFPD | DELTA EFPD | ANO UNIT TWO CALCULATED RX POWER | CORRECT RX POWER | CORRECTED EFPD | EFPD CORRECTION |
|--------------------------|---------------|---------------|--|---------------------|-------------------|--------------------|
| 0000 | 166.2793 | | | | | |
| | | -166.279 | -399070. | NA | 0 | 0 |
| 0100 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0200 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0300 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0400 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0500 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0600 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0700 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0800 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0900 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1000 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1100 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1200 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1300 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1400 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1500 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1600 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1700 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1800 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1900 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2000 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2100 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2200 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2300 | 0 | | | | | |
| | | 166.2793 | 399070.4 | NA | 0 | 0 |
| 0000 | 166.2793 | | | | | |

TOTAL RX POWER = 0

RX POWER CORRECTIONS = 0

CORRECTED RX POWER = 0

| DAY | ENTER | DELTA | ANO UNIT TWO | CORRECT | CORRECTED | EFPD |
|-----------|----------|----------|--------------|----------|-----------|------------|
| 11-Oct-91 | EFPD | EFPD | CALCULATED | RX POWER | EFPD | CORRECTION |
| HOUR | | | RX POWER | | | |
| 0000 | 166.2793 | | | | | |
| | | -166.279 | -399070. | NA | 0 | 0 |
| 0100 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0200 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0300 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0400 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0500 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0600 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0700 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0800 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 0900 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1000 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1100 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1200 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1300 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1400 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1500 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1600 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1700 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1800 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 1900 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2000 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2100 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2200 | 0 | | | | | |
| | | 0 | 0 | NA | 0 | 0 |
| 2300 | 0 | | | | | |
| | | 166.3102 | 399144.5 | NA | 0 | 0 |
| 0000 | 166.3102 | | | | | |

TOTAL RX POWER = 3.089

RX POWER CORRECTIONS = 0

CORRECTED RX POWER = 3.089

| DAY 12-Oct-91 HOUR | ENTER EFPD | DELTA EFPD | ANO UNIT TWO CALCULATED RX POWER | CORRECT RX POWER | CORRECTED EFPD | EFPD CORRECTION |
|--------------------------|---------------|---------------|--|---------------------|-------------------|--------------------|
| 0000 | 166.3102 | | | | | |
| 0100 | 166.3181 | 0.00784 | 18.816 | NA | 0 | 0 |
| 0200 | 166.3255 | 0.00742 | 17.808 | NA | 0 | 0 |
| 0300 | 166.3333 | 0.00784 | 18.816 | NA | 0 | 0 |
| 0400 | 166.3413 | 0.00798 | 19.152 | NA | 0 | 0 |
| 0500 | 166.3492 | 0.0079 | 18.96 | NA | 0 | 0 |
| 0600 | 166.3570 | 0.00779 | 18.696 | NA | 0 | 0 |
| 0700 | 166.3648 | 0.00782 | 18.768 | NA | 0 | 0 |
| 0800 | 166.3725 | 0.00774 | 18.576 | NA | 0 | 0 |
| 0900 | 166.3802 | 0.00766 | 18.384 | NA | 0 | 0 |
| 1000 | 166.3879 | 0.00774 | 18.576 | NA | 0 | 0 |
| 1100 | 166.3957 | 0.00776 | 18.624 | NA | 0 | 0 |
| 1200 | 166.4035 | 0.00778 | 18.672 | NA | 0 | 0 |
| 1300 | 166.4119 | 0.00841 | 20.184 | NA | 0 | 0 |
| 1400 | 166.4214 | 0.00955 | 22.92 | NA | 0 | 0 |
| 1500 | 166.4328 | 0.01134 | 27.216 | NA | 0 | 0 |
| 1600 | 166.4446 | 0.0118 | 28.32 | NA | 0 | 0 |
| 1700 | 166.4565 | 0.01188 | 28.512 | NA | 0 | 0 |
| 1800 | 166.4683 | 0.01187 | 28.488 | NA | 0 | 0 |
| 1900 | 166.4802 | 0.01184 | 28.416 | NA | 0 | 0 |
| 2000 | 166.4921 | 0.01188 | 28.512 | NA | 0 | 0 |
| 2100 | 166.5039 | 0.01188 | 28.512 | NA | 0 | 0 |
| 2200 | 166.5159 | 0.01192 | 28.608 | NA | 0 | 0 |
| 2300 | 166.5279 | 0.01207 | 28.968 | NA | 0 | 0 |
| 0000 | 166.5408 | 0.01283 | 30.792 | NA | 0 | 0 |

TOTAL RX POWER = 23.054

RX POWER CORRECTIONS = 0

CORRECTED RX POWER = 23.054

| DAY 13-Oct-91 | ENTER EFPD | DELTA EFPD | ANO UNIT TWO CALCULATED RX POWER | CORRECT RX POWER | CORRECTED EFPD | EFPD CORRECTION |
|------------------|---------------|---------------|--|---------------------|-------------------|--------------------|
| 0000 | 166.5408 | | | | | |
| | | 0.015 | 36 | NA | 0 | 0 |
| 0100 | 166.5558 | | | | | |
| | | 0.01743 | 41.832 | NA | 0 | 0 |
| 0200 | 166.5732 | | | | | |
| | | 0.01925 | 46.2 | NA | 0 | 0 |
| 0300 | 166.5924 | | | | | |
| | | 0.02149 | 51.576 | NA | 0 | 0 |
| 0400 | 166.6139 | | | | | |
| | | 0.02334 | 56.016 | NA | 0 | 0 |
| 0500 | 166.6373 | | | | | |
| | | 0.02553 | 61.272 | NA | 0 | 0 |
| 0600 | 166.6628 | | | | | |
| | | 0.02742 | 65.808 | NA | 0 | 0 |
| 0700 | 166.6902 | | | | | |
| | | 0.02808 | 67.392 | NA | 0 | 0 |
| 0800 | 166.7183 | | | | | |
| | | 0.02835 | 68.04 | NA | 0 | 0 |
| 0900 | 166.7466 | | | | | |
| | | 0.02832 | 67.968 | NA | 0 | 0 |
| 1000 | 166.7750 | | | | | |
| | | 0.02829 | 67.896 | NA | 0 | 0 |
| 1100 | 166.8033 | | | | | |
| | | 0.02867 | 68.808 | NA | 0 | 0 |
| 1200 | 166.8319 | | | | | |
| | | 0.03059 | 73.416 | NA | 0 | 0 |
| 1300 | 166.8625 | | | | | |
| | | 0.03185 | 76.44 | NA | 0 | 0 |
| 1400 | 166.8944 | | | | | |
| | | 0.03285 | 78.84 | NA | 0 | 0 |
| 1500 | 166.9272 | | | | | |
| | | 0.03435 | 82.44 | NA | 0 | 0 |
| 1600 | 166.9616 | | | | | |
| | | 0.03564 | 85.536 | NA | 0 | 0 |
| 1700 | 166.9972 | | | | | |
| | | 0.03687 | 88.488 | NA | 0 | 0 |
| 1800 | 167.0341 | | | | | |
| | | 0.03709 | 89.016 | NA | 0 | 0 |
| 1900 | 167.0712 | | | | | |
| | | 0.03716 | 89.184 | NA | 0 | 0 |
| 2000 | 167.1083 | | | | | |
| | | 0.03764 | 90.336 | NA | 0 | 0 |
| 2100 | 167.146 | | | | | |
| | | 0.0389 | 93.36 | NA | 0 | 0 |
| 2200 | 167.1849 | | | | | |
| | | 0.04008 | 96.192 | NA | 0 | 0 |
| 2300 | 167.2249 | | | | | |
| | | 0.04089 | 98.136 | NA | 0 | 0 |
| 0000 | 167.2658 | | | | | |

TOTAL RX POWER = 72.508

RX POWER CORRECTIONS = 0

CORRECTED RX POWER = 72.508

ATTACHMENT 2

RESULTS OF ISOTOPIC ANALYSIS

RESULTS OF ANALYSIS PERFORMED
WHILE EXCEEDING THE LIMITS

Configuration : DKB200:[GSDATA]91-05286.CNF;1
 Analyses by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample date : 9-OCT-1991 09:25:00 Acquisition date : 9-OCT-1991 11:06:13
 Sample ID : 2 RCS Liquid Sample quantity : 10.000 ml
 Sample type : 60 ml bottle Sample geometry : Table 202
 Detector name : HPGe 2 Detector geometry: 60 ml bottle 14
 Elapsed live time: 0 00:30:00.00 Flapsed real time: 0 00:31:24.24 4.5%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spline Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 133
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 118 88.72%

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| BE-7 | 53.40D | 1.001 | 1.582E-03 | 1.584E-03 | 0.481E-03 | 30.35 | |
| NA-24 | 15.03H | 1.094 | 4.473E-03 | 4.894E-03 | 0.086E-03 | 1.75 | |
| CR-51 | 27.70D | 1.002 | 8.390E-04 | 8.407E-04 | 4.594E-04 | 54.64 | |
| CO-56 | 77.30D | 1.001 | 8.934E-03 | 8.941E-03 | 0.111E-03 | 1.24 | K |
| MN-56 | 2.58H | 1.688 | 9.024E-03 | 1.523E-02 | 0.019E-02 | 1.24 | K |
| CO-58 | 70.78D | 1.001 | 5.040E-04 | 5.044E-04 | 0.531E-04 | 10.53 | |
| FE-59 | 45.10D | 1.001 | 5.306E-04 | 5.313E-04 | 1.024E-04 | 19.28 | K |
| CO-60 | 5.27Y | 1.000 | 2.160E-04 | 2.160E-04 | 0.540E-04 | 24.99 | |
| NB-94 | 20300.00Y | 1.000 | 4.309E-04 | 4.309E-04 | 0.601E-04 | 13.96 | K |
| ZR-95 | 64.40D | 1.001 | 1.721E-04 | 1.722E-04 | 0.851E-04 | 49.38 | |
| SB-122 | 2.70D | 1.021 | 1.233E-04 | 1.259E-04 | 0.688E-04 | 54.70 | |
| W-187 | 23.90H | 1.058 | 6.963E-04 | 7.368E-04 | 2.236E-04 | 30.35 | |
| Total Activity : | | | 2.753E-02 | 3.421E-02 | | | |

Nuclide Type : AG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| AR-41 | 1.83H | 2.089 | 3.182E-04 | 6.646E-04 | 0.850E-04 | 12.79 | |
| Total Activity : | | | 3.182E-04 | 6.646E-04 | | | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|---------|--------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| RB-68 | 17.80M | 89.249 | 1.680E-03 | 1.499E-01 | 0.346E-01 | 23.08 | |
| Y-88 | 106.60D | 1.001 | 2.591E-04 | 2.592E-04 | 0.598E-04 | 23.08 | |
| Y-92 | 3.53H | 1.466 | 4.978E-04 | 7.295E-04 | 3.532E-04 | 48.42 | |
| NB-95 | 35.15D | 1.002 | 6.030E-04 | 6.040E-04 | 0.653E-04 | 10.82 | |
| RU-106 | 368.20D | 1.000 | 1.404E-02 | 1.404E-02 | 0.064E-02 | 4.59 | |
| CD-113M | 14.60Y | 1.000 | 3.505E+00 | 3.505E+00 | 0.771E+00 | 22.00 | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma Error | Flags |
|------------------|---------|--------|-----------------------|----------------------|-----------------------------|------------------|-------|
| SB-127 | 3.85D | 1.015 | 2.496E-04 | 2.533E-04 | 1.176E-04 | 46.41 | |
| TE-132 | 3.25D | 1.017 | 8.81 E-05 | 8.969E-05 | 5.164E-05 | 57.58 | |
| CS-134 | 2.06Y | 1.000 | 5.822E-04 | 5.822E-04 | 0.745E-04 | 12.79 | |
| CS-137 | 30.10Y | 1.000 | 7.167E-04 | 7.167E-04 | 0.595E-04 | 8.30 | |
| CS-138 | 32.20M | 12.157 | 6.525E-03 | 7.932E-02 | 0.151E-02 | 1.91 | |
| BA-139 | 1.42H | 2.590 | 1.971E-03 | 5.106E-03 | 0.737E-03 | 14.43 | |
| CE-139 | 137.50D | 1.000 | 4.632E-04 | 4.634E-04 | 0.668E-04 | 14.43 | |
| BA-140 | 12.79D | 1.004 | 4.526E-04 | 4.546E-04 | 2.406E-04 | 52.94 | |
| Total Activity : | | | 3.534E+00 | 3.758E+00 | | | |

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|------------------|-------|
| I-131 | 8.04D | 1.007 | 7.067E-03 | 7.117E-03 | 0.107E-03 | 1.50 | |
| I-132 | 2.38M | 1.762 | 1.673E-02 | 2.949E-02 | 0.019E-02 | 0.64 | |
| I-133 | 20.30M | 1.069 | 2.178E-02 | 2.327E-02 | 0.012E-02 | 0.53 | |
| I-134 | 52.60M | 4.635 | 9.306E-03 | 4.313E-02 | 0.053E-02 | 1.24 | |
| I-135 | 6.61H | 1.227 | 2.642E-02 | 3.240E-02 | 0.043E-02 | 1.33 | |
| Total Activity : | | | 8.130E-02 | 1.354E-01 | | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma Error | Flags |
|------------------|--------|---------|-----------------------|----------------------|-----------------------------|------------------|-------|
| XE-133 | 5.29D | 1.011 | 1.562E-03 | 1.579E-03 | 0.140E-03 | 8.88 | |
| XE-135 | 9.08H | 1.160 | 3.637E-03 | 4.220E-03 | 0.088E-03 | 2.09 | |
| XE-135M | 15.60M | 166.538 | 4.550E-03 | 7.578E-01 | 0.128E-01 | 1.69 | |
| Total Activity : | | | 9.750E-03 | 7.636E-01 | | | |

Grand Total Activity : 3.652E+00 4.692E+00

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 9-OCT-1991 09:25:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 7.117E-03 uCi/ml |
| I-132 | 2.949E-02 uCi/ml |
| I-133 | 2.326E-02 uCi/ml |
| I-134 | 4.313E-02 uCi/ml |
| I-135 | 3.240E-02 uCi/ml |
| Cs-134 | 5.822E-04 uCi/ml |
| Cs-137 | 7.035E-04 uCi/ml |
| I-131DE | 1.792E-02 uCi/ml |
| I-131/I-133 ratio | 3.059E-01 |
| Cs-134/Cs-137 ratio | 8.276E-01 |

RESULTS OF LAST ANALYSIS PERFORMED
PRIOR TO EXCEEDING THE LIMITS

Configuration : DKB200:[GSDATA]91-05314.CNF;1
 Analyses by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample title : 2 hr IDE and TSP IDE
 Sample date : 9-OCT-1991 20:00:00 Acquisition date : 9-OCT-1991 20:28:37
 Sample ID : 2 RCS Liquid Sample quantity : 10.000 ml
 Sample type : 60 ml bottle Sample geometry : Table 104
 Detector name : HPGe 1 Detector geometry: 60 ml bottle 33
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:32:33.43 7.9%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spline Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 147
 Number of unidentified lines 18
 Number of lines tentatively identified by NID 129 87.76%

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| NA-24 | 15.03H | 1.035 | 5.128E-03 | 5.308E-03 | 0.521E-03 | 9.81 | |
| CR-51 | 27.70D | 1.001 | 2.636E-02 | 2.638E-02 | 0.524E-02 | 19.85 | |
| CO-56 | 77.30D | 1.000 | 3.949E-02 | 3.950E-02 | 0.078E-02 | 1.99 | K |
| MN-56 | 2.58H | 1.222 | 3.667E-03 | 4.481E-03 | 1.190E-03 | 26.55 | |
| CO-58 | 70.78D | 1.000 | 7.044E-02 | 7.046E-02 | 0.107E-02 | 1.52 | |
| FE-59 | 45.10D | 1.000 | 1.081E-02 | 1.082E-02 | 0.103E-02 | 9.56 | K |
| CO-60 | 5.27Y | 1.000 | 4.237E-03 | 4.237E-03 | 0.544E-03 | 12.84 | |
| ZK-95 | 64.40D | 1.000 | 5.033E-03 | 5.034E-03 | 0.921E-03 | 18.29 | |
| AG-110M | 249.90D | 1.000 | 3.416E-02 | 3.416E-02 | 0.110E-02 | 3.22 | |
| SB-122 | 2.70D | 1.008 | 1.583E-02 | 1.595E-02 | 0.095E-02 | 5.96 | |
| Total Activity : | | | 2.151E-01 | 2.163E-01 | | | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| RB-88 | 17.80M | 5.379 | 1.540E-02 | 8.284E-02 | 2.360E-02 | 28.49 | |
| Y-88 | 106.60D | 1.000 | 2.376E-03 | 2.376E-03 | 0.677E-03 | 28.49 | |
| SR-91 | 9.67H | 1.055 | 2.566E-03 | 2.708E-03 | 0.999E-03 | 36.89 | K |
| Y-93 | 10.30H | 1.052 | 2.547E-02 | 2.679E-02 | 0.696E-02 | 25.98 | |
| NB-95 | 35.15D | 1.001 | 4.786E-03 | 4.789E-03 | 0.614E-03 | 12.83 | |
| NB-97 | 16.80H | 1.031 | 8.747E-03 | 9.021E-03 | 0.599E-03 | 6.64 | |
| ZR-97 | 16.80H | 1.031 | 6.476E-03 | 6.679E-03 | 0.558E-03 | 8.35 | |
| RU-106 | 368.20D | 1.000 | 1.345E-01 | 1.345E-01 | 0.080E-01 | 5.93 | |
| CD-109 | 1.24Y | 1.000 | 1.114E-01 | 1.114E-01 | 0.140E-01 | 12.53 | |
| CD-113M | 14.60Y | 1.000 | 1.428E+02 | 1.428E+02 | 0.101E+02 | 7.07 | |
| TE-132 | 3.25D | 1.007 | 3.774E-01 | 3.800E-01 | 0.014E-01 | 0.36 | K |
| CS-134 | 2.06Y | 1.000 | 1.322E-01 | 1.322E-01 | 0.012E-01 | 0.92 | |
| CS-136 | 12.98D | 1.002 | 4.563E-02 | 4.571E-02 | 0.162E-02 | 3.55 | |
| CS-137 | 30.10Y | 1.000 | 1.187E-01 | 1.187E-01 | 0.001E+00 | 0.83 | |
| CS-138 | 32.20M | 2.576 | 4.806E-03 | 1.238E-02 | 0.183E-02 | 14.74 | |

Summary of Nuclide Activity (continued)
Sample ID : 2 RCS Liquid

Page : 0
Acquisition date : 9-OCT-1991 20:28:37

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------------|
| BA-140 | 12.79D | 1.002 | 6.863E-02 | 6.874E-02 | 0.364E-02 | 5.30 |
| CE-144 | 284.20D | 1.000 | 1.424E-02 | 1.424E-02 | 0.330E-02 | 23.15 |
| Total Activity : | | | 1.438E+02 | 1.439E+02 | | |

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------------|
| I-131 | 8.04D | 1.003 | 8.124E-01 | 8.146E-01 | 0.019E-01 | 0.23 |
| I-132 | 2.38H | 1.242 | 3.774E-01 | 4.689E-01 | 0.017E-01 | 0.36 |
| I-133 | 20.30H | 1.026 | 6.859E-01 | 7.036E-01 | 0.018E-01 | 0.26 |
| I-134 | 52.60M | 1.793 | 4.113E-02 | 7.375E-02 | 2.145E-02 | 1.99 |
| I-135 | 6.61H | 1.081 | 3.566E-01 | 3.857E-01 | 1.11E-01 | 1.02 |
| Total Activity : | | | 2.273E+00 | 2.447E+00 | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------------|
| XE-131M | 11.80D | 1.002 | 1.018E-01 | 1.019E-01 | 0.201E-01 | 19.76 |
| XE-133 | 5.29D | 1.004 | 6.067E-02 | 6.092E-02 | 0.160E-02 | 2.63 |
| XE-135 | 9.08H | 1.059 | 1.432E-02 | 1.516E-02 | 0.066E-02 | 4.37 |
| XE-135M | 15.60M | 6.749 | 4.630E-02 | 3.125E-01 | 0.053E-01 | 2.02 |
| Total Activity : | | | 2.230E-01 | 4.905E-01 | | |

Grand Total Activity : 1.465E+02 1.471E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 9-OCT-1991 20:00:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 6.146E-01 uCi/ml |
| I-132 | 4.689E-01 uCi/ml |
| I-133 | 7.035E-01 uCi/ml |
| I-134 | 6.697E-02 uCi/ml |
| I-135 | 3.857E-01 uCi/ml |
| Cs-134 | 1.322E-01 uCi/ml |
| Cs-137 | 1.187E-01 uCi/ml |
| I-131DE | 1.055E+00 uCi/ml |
| I-131/I-133 ratio | 1.158E+00 |
| Cs-134/Cs-137 ratio | 1.114E+00 |

Configuration : DKB200:[GSDATA]91-05317.CNF;1
 Analyses by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample title : 4 HR IDE
 Sample date : 9-OCT-1991 22:00:00 Acquisition date : 9-OCT-1991 22:38:42
 Sample ID : 2 RCS Liquid Sample quantity : 10.000 ml
 Sample type : 60 ml bottle Sample geometry : Table 104
 Detector name : HPGe 1 Detector geometry: 60 ml bottle 33
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:32:35.09 7.9%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spline Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 140
 Number of unidentified lines 23
 Number of lines tentatively identified by NID 117 83.57%

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| NA-24 | 15.03H | 1.043 | 5.375E-03 | 5.607E-03 | 0.551E-03 | 9.82 | |
| CR-51 | 27.70D | 1.001 | 1.689E-02 | 1.691E-02 | 0.527E-02 | 31.16 | |
| CO-56 | 77.30D | 1.000 | 1.002E-02 | 1.002E-02 | 0.063E-02 | 6.29 | K |
| MN-56 | 2.58H | 1.279 | 1.012E-02 | 1.293E-02 | 0.081E-02 | 6.29 | K |
| CC-58 | 70.78D | 1.000 | 5.751E-02 | 5.753E-02 | 0.092E-02 | 1.59 | |
| FE-59 | 45.10D | 1.001 | 8.108E-03 | 8.112E-03 | 0.952E-03 | 11.74 | K |
| CO-60 | 5.27Y | 1.000 | 3.547E-03 | 3.547E-03 | 0.391E-03 | 11.03 | |
| ZR-95 | 64.40D | 1.000 | 3.000E-03 | 3.002E-03 | 0.876E-03 | 29.20 | |
| AG-110M | 249.90D | 1.000 | 9.761E-03 | 9.762E-03 | 0.735E-03 | 7.53 | |
| SB-122 | 2.70D | 1.010 | 1.893E-02 | 1.911E-02 | 0.108E-02 | 5.67 | |
| Total Activity : | | | 1.433E-01 | 1.465E-01 | | | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| RB-88 | 17.80M | 7.971 | 1.233E-02 | 9.829E-02 | 2.650E-02 | 26.96 | |
| Y-88 | 106.60D | 1.000 | 1.902E-03 | 1.903E-03 | 0.513E-03 | 26.96 | |
| SR-91 | 9.67H | 1.068 | 4.147E-03 | 4.428E-03 | 0.879E-03 | 19.85 | K |
| NB-95 | 35.15D | 1.001 | 1.536E-03 | 1.537E-03 | 0.445E-03 | 26.96 | |
| NB-97 | 16.80H | 1.039 | 3.390E-03 | 3.520E-03 | 0.510E-03 | 14.49 | |
| ZR-97 | 16.80H | 1.039 | 2.799E-03 | 2.907E-03 | 0.612E-03 | 21.06 | |
| MO-99 | 2.76D | 1.010 | 9.955E-02 | 1.005E-01 | 0.041E-01 | 4.12 | |
| TC-99M | 2.76D | 1.010 | 3.837E-03 | 3.874E-03 | 0.414E-03 | 10.68 | |
| RU-106 | 368.20D | 1.000 | 8.823E-02 | 8.824E-02 | 0.670E-02 | 7.59 | |
| CD-109 | 1.24Y | 1.000 | 1.088E-01 | 1.088E-01 | 0.130E-01 | 11.97 | |
| CD-113M | 14.60Y | 1.000 | 1.210E+02 | 1.210E+02 | 0.092E+02 | 7.61 | |
| TE-132 | 3.25D | 1.008 | 7.811E-03 | 7.875E-03 | 0.577E-03 | 7.33 | |
| CS-134 | 2.06Y | 1.000 | 1.649E-01 | 1.649E-01 | 0.013E-01 | 0.78 | |
| CS-136 | 12.98D | 1.002 | 5.610E-02 | 5.622E-02 | 0.166E-02 | 2.95 | |
| CS-137 | 30.10Y | 1.000 | 1.479E-01 | 1.479E-01 | 0.010E-01 | 0.71 | |

Summary of Nuclide Activity (continued)
Sample ID : 2 RCS Liquid

Page : 0
Acquisition date : 9-OCT-1991 22:38:42

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| BA-140 | 12.79D | 1.002 | 7.982E-02 | 7.998E-02 | 0.328E-02 | 4.10 | |
| Total Activity : | | | 1.217E+02 | 1.218E+02 | | | |

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| I-131 | 8.04D | 1.003 | 9.825E-01 | 9.858E-01 | 0.020E-01 | 0.21 | |
| I-132 | 2.38H | 1.305 | 3.256E-01 | 4.248E-01 | 0.017E-01 | 0.39 | |
| I-133 | 20.30H | 1.032 | 7.721E-01 | 7.967E-01 | 0.019E-01 | 0.24 | |
| I-134 | 52.60M | 2.049 | 1.043E-02 | 2.137E-02 | 0.134E-02 | 6.29 | |
| I-135 | 6.61H | 1.101 | 3.487E-01 | 3.839E-01 | 0.043E-01 | 1.11 | |
| Total Activity : | | | 2.439E+00 | 2.612E+00 | | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|--------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| XE-131M | 11.80D | 1.002 | 1.121E-01 | 1.123E-01 | 0.209E-01 | 18.57 | |
| XE-133 | 5.29D | 1.005 | 7.239E-02 | 7.276E-02 | 0.166E-02 | 2.28 | |
| XE-135 | 9.08H | 1.072 | 1.481E-02 | 1.588E-02 | 0.074E-02 | 4.68 | |
| XE-135M | 15.60M | 10.573 | 4.891E-02 | 5.171E-01 | 0.098E-01 | 1.89 | |
| Total Activity : | | | 2.482E-01 | 7.181E-01 | | | |

Grand Total Activity : 1.246E+02 1.253E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 9-OCT-1991 22:00:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 9.858E-01 uCi/ml |
| I-132 | 4.248E-01 uCi/ml |
| I-133 | 7.966E-01 uCi/ml |
| I-134 | 2.137E-02 uCi/ml |
| I-135 | 3.839E-01 uCi/ml |
| Cs-134 | 1.649E-01 uCi/ml |
| Cs-137 | 1.479E-01 uCi/ml |
| I-131DE | 1.249E+00 uCi/ml |
| I-131/I-133 ratio | 1.238E+00 |
| Cs-134/Cs-137 ratio | 1.115E+00 |

Configuration : FKB200:[GSDATA]91-05319.CNF;1
 Analyses by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample title : RCS IDE
 Sample date : 10-OCT-1991 00:00:00 Acquisition date : 10-OCT-1991 01:03:07
 Sample ID : 2 RCS Liquid Sample quantity : 5.0000 ml
 Sample type : 60 ml bottle Sample geometry : Table 204
 Detector name : HPGe 2 Detector geometry: 60 ml bottle 33
 Elapsed live time: 0 00:05:20.16 Elapsed real time: 0 00:05:30.59 3.2%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spline Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 92
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 85 92.39%

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| NA-24 | 15.03H | 1.052 | 4.043E-03 | 4.253E-03 | 3.406E-03 | 80.08 | |
| CO-58 | 70.78D | 1.000 | 4.540E-02 | 4.542E-02 | 0.308E-02 | 6.77 | |
| FE-59 | 45.10D | 1.001 | 5.706E-03 | 5.710E-03 | 2.406E-03 | 42.13 | K |
| CO-60 | 5.27Y | 1.000 | 2.206E-03 | 2.206E-03 | 0.606E-03 | 27.49 | K |
| ZR-95 | 64.40D | 1.000 | 5.080E-02 | 5.083E-02 | 0.523E-02 | 10.28 | K |
| SB-122 | 2.70D | 1.012 | 1.982E-02 | 2.005E-02 | 0.376E-02 | 18.76 | |
| Total Activity : | | | 1.280E-01 | 1.285E-01 | | | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| Y-92 | 3.53H | 1.241 | 1.407E-02 | 1.745E-02 | 1.688E-02 | 96.70 | |
| N9-95 | 35.15D | 1.001 | 4.950E-03 | 4.954E-03 | 3.679E-03 | 74.26 | |
| RJ-106 | 368.20D | 1.000 | 8.865E-02 | 8.866E-02 | 2.415E-02 | 27.24 | |
| CD-109 | 1.24Y | 1.000 | 1.684E-01 | 1.684E-01 | 0.642E-01 | 38.10 | |
| CD-113M | 14.60Y | 1.000 | 1.454E+02 | 1.454E+02 | 0.423E+02 | 29.11 | |
| TE-132 | 3.25D | 1.010 | 2.599E-01 | 2.625E-01 | 0.045E-01 | 1.70 | K |
| CS-134 | 2.06Y | 1.000 | 1.931E-01 | 1.931E-01 | 0.049E-01 | 2.56 | |
| CS-136 | 12.98D | 1.002 | 7.357E-02 | 7.375E-02 | 0.681E-02 | 9.23 | |
| CS-137 | 30.10Y | 1.000 | 1.672E-01 | 1.672E-01 | 0.045E-01 | 2.67 | |
| BA-140 | 12.79D | 1.002 | 7.547E-02 | 7.566E-02 | 1.233E-02 | 16.29 | |
| Total Activity : | | | 1.464E+02 | 1.464E+02 | | | |

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|-------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| I-131 | 8.04D | 1.004 | 1.085E+00 | 1.090E+00 | 0.008E+00 | 0.76 | |
| I-132 | 2.38H | 1.377 | 2.599E-01 | 3.578E-01 | 0.061E-01 | 1.70 | |

Summary of Nuclide Activity (continued)
Sample ID : 2 RCS Liquid

Page : 0
Acquisition date : 10-OCT-1991 01:03:07

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| I-133 | 20.30H | 1.038 | 7.823E-01 | 8.122E-01 | 0.073E-01 | 0.90 | |
| I-135 | 6.61H | 1.122 | 3.185E-01 | 3.574E-01 | 0.139E-01 | 3.90 | |
| Total Activity : | | | 2.446E+00 | 2.617E+00 | | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|--------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| XE-133 | 5.29D | 1.006 | 8.191E-02 | 8.240E-02 | 0.917E-02 | 11.13 | |
| XE-135 | 9.08H | 1.087 | 2.294E-02 | 2.495E-02 | 0.349E-02 | 13.98 | |
| XE-135M | 15.60M | 18.635 | 4.656E-02 | 8.675E-01 | 0.589E-01 | 6.79 | |
| Total Activity : | | | 1.514E-01 | 9.749E-01 | | | |

Grand Total Activity : 1.491E+02 1.501E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 10-OCT-1991 00:00:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 1.080E+00 uCi/ml |
| I-132 | 3.682E-01 uCi/ml |
| I-133 | 8.114E-01 uCi/ml |
| I-134 | 0.000E+00 uCi/ml |
| I-135 | 3.410E-01 uCi/ml |
| Cs-134 | 1.872E-01 uCi/ml |
| Cs-137 | 1.701E-01 uCi/ml |
| I-131DE | 1.342E+00 uCi/ml |
| I-131/I-133 ratio | 1.332E+00 |
| Cs-134/Cs-137 ratio | 1.100E+00 |

RESULTS OF ANALYSIS PERFORMED
AFTER ACTIVITY WAS REDUCED TO LESS THAN LIMIT

VAX/VMS Nuclide Identification Report V2.7 Generated 5-FEB-1992 13:13:06

Configuration : DKB200:[GSDATA]91-05334.CNF;1
 Analysis by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample title : tsp IDE
 Sample date : 10-OCT-1991 04:00:00 Acquisition date : 10-OCT-1991 04:52:07
 Sample ID : 2 RCS Liquid Sample quantity : 2.5000 ml
 Sample type : 60 ml bottle Sample geometry : Table 103
 Detector name : HPGe 1 Detector geometry: 60 ml bottle 18
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:31:31.37 4.8%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spine Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 131
 Number of unidentified lines 23
 Number of lines tentatively identified by NID 108 82.44%

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| NA-24 | 15.03H | 1.054 | 1.946E-03 | 2.051E-03 | 0.410E-03 | 20.00 | |
| CR-51 | 27.70D | 1.001 | 1.086E-02 | 1.087E-02 | 0.410E-02 | 37.72 | |
| CO-56 | 77.30D | 1.000 | 7.722E-04 | 7.726E-04 | 3.066E-04 | 39.71 | K |
| MN-56 | 2.58H | 1.355 | 7.800E-04 | 1.057E-03 | 0.420E-03 | 39.71 | K |
| CO-58 | 70.78D | 1.000 | 3.010E-02 | 3.011E-02 | 0.069E-02 | 2.30 | |
| FE-59 | 45.10D | 1.001 | 4.888E-03 | 4.892E-03 | 0.651E-03 | 13.31 | K |
| CO-60 | 5.27Y | 1.000 | 2.141E-03 | 2.141E-03 | 0.429E-03 | 20.04 | |
| ZR-95 | 64.40D | 1.001 | 3.319E-02 | 3.320E-02 | 0.103E-02 | 3.10 | K |
| SB-122 | 2.70D | 1.012 | 1.688E-02 | 1.708E-02 | 0.085E-02 | 4.95 | |
| Total Activity : | | | 1.015E-01 | 1.022E-01 | | | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|---------|--------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| RB-88 | 17.60M | 13.220 | 1.953E-03 | 2.582E-02 | 1.006E-02 | 38.95 | K |
| Y-88 | 106.60D | 1.000 | 4.822E-04 | 4.824E-04 | 1.879E-04 | 38.95 | K |
| SR-91 | 9.67H | 1.084 | 2.564E-03 | 2.781E-03 | 0.691E-03 | 24.85 | K |
| Y-93 | 10.30H | 1.079 | 1.731E-02 | 1.868E-02 | 0.468E-02 | 25.07 | |
| NB-95 | 35.15D | 1.001 | 1.104E-03 | 1.105E-03 | 0.275E-03 | 24.85 | |
| ZR-97 | 16.80H | 1.048 | 5.319E-04 | 5.573E-04 | 3.623E-04 | 65.00 | |
| MO-99 | 2.76D | 1.012 | 5.058E-02 | 5.118E-02 | 0.363E-02 | 7.09 | |
| TC-99M | 2.76D | 1.012 | 1.460E-03 | 1.477E-03 | 0.311E-03 | 21.05 | |
| RU-106 | 368.20D | 1.000 | 4.817E-02 | 4.818E-02 | 0.550E-02 | 11.41 | |
| CD-109 | 1.24Y | 1.000 | 1.026E-01 | 1.026E-01 | 0.097E-01 | 9.48 | |
| CD-113M | 14.60Y | 1.000 | 5.773E+01 | 5.773E+01 | 0.690E+01 | 11.94 | |
| TE-132 | 3.25D | 1.010 | 1.766E-01 | 1.784E-01 | 0.001E+00 | 0.55 | K |
| CS-134 | 2.06Y | 1.000 | 1.483E-01 | 1.483E-01 | 0.011E-01 | 0.77 | |
| CS-136 | 12.98D | 1.003 | 5.142E-02 | 5.155E-02 | 0.142E-02 | 2.76 | |
| CS-137 | 30.10Y | 1.000 | 1.317E-01 | 1.317E-01 | 0.010E-01 | 0.79 | |
| BA-139 | 1.42H | 1.736 | 1.185E-02 | 2.057E-02 | 0.325E-02 | 15.79 | |

Summary of Nuclide Activity (continued)
Sample ID : 2 RCS Liquid

Page : 0
Acquisition date : 10-OCT-1991 04:52:07

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| CE-139 | 137.50D | 1.000 | 2.784E-03 | 2.785E-03 | 0.440E-03 | 15.79 | |
| BA-140 | 12.79D | 1.003 | 4.373E-02 | 4.384E-02 | 0.266E-02 | 6.07 | |
| Total Activity : | | | 5.852E+01 | 5.856E+01 | | | |

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| I-131 | 8.04D | 1.004 | 7.556E-01 | 7.587E-01 | 0.017E-01 | 0.22 | |
| I-132 | 2.38H | 1.389 | 1.766E-01 | 2.453E-01 | 0.013E-01 | 0.55 | |
| I-133 | 20.30H | 1.039 | 4.940E-01 | 5.135E-01 | 0.015E-01 | 0.30 | |
| I-134 | 52.60M | 2.429 | 8.043E-04 | 1.954E-03 | 0.776E-03 | 39.71 | |
| I-135 | 6.61H | 1.126 | 1.462E-01 | 1.646E-01 | 0.027E-01 | 1.64 | |
| Total Activity : | | | 1.573E+00 | 1.684E+00 | | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|--------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| XE-131M | 11.80D | 1.003 | 1.137E-01 | 1.140E-01 | 0.180E-01 | 15.79 | |
| XE-133 | 5.29D | 1.006 | 5.761E-02 | 5.797E-02 | 0.137E-02 | 2.37 | |
| XE-135 | 9.08H | 1.090 | 7.892E-03 | 8.603E-03 | 0.557E-03 | 6.47 | |
| XE-135M | 15.60M | 18.843 | 2.071E-02 | 3.902E-01 | 0.128E-01 | 3.27 | |
| Total Activity : | | | 1.999E-01 | 5.707E-01 | | | |

Grand Total Activity : 6.040E+01 6.092E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 10-OCT-1991 04:00:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 7.587E-01 uCi/ml |
| I-132 | 2.453E-01 uCi/ml |
| I-133 | 5.134E-01 uCi/ml |
| I-134 | 0.000E+00 uCi/ml |
| I-135 | 1.646E-01 uCi/ml |
| Cs-134 | 1.483E-01 uCi/ml |
| Cs-137 | 1.316E-01 uCi/ml |
| I-131DE | 9.201E-01 uCi/ml |
| I-131/I-133 ratio | 1.478E+00 |
| Cs-134/Cs-137 ratio | 1.127E+00 |

VAX/VMS Nuclide Identification Report V2.7 Generated 5-FEB-1992 13:13:26

Configuration : DKB200:[GSDATA]91-05346.CNF;1
 Analyses by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample date : 10-OCT-1991 06:00:00 Acquisition date : 10-OCT-1991 06:33:42
 Sample ID : 2 RCS Liquid Sample quantity : 2.5000 ml
 Sample type : 60 ml bottle Sample geometry : Table 303
 Detector name : HPGe 3 Detector geometry: 60 ml bottle 18
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:31:57.42 6.1%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spline Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 127
 Number of unidentified lines 26
 Number of lines tentatively identified by NID 101 79.53%

Nuclide Type : NP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.28E+09Y | 1.000 | 4.829E-03 | 4.829E-03 | 2.143E-03 | 44.39 | |
| U-235 | 7.04E+08Y | 1.000 | 7.901E-04 | 7.901E-04 | 4.591E-04 | 58.11 | K |
| Total Activity : | | | 5.619E-03 | 5.619E-03 | | | |

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| CO-58 | 70.78D | 1.000 | 2.567E-02 | 2.568E-02 | 0.054E-02 | 2.12 | |
| FE-59 | 45.10D | 1.001 | 7.260E-03 | 7.264E-03 | 0.973E-03 | 13.40 | K |
| CO-60 | 5.27Y | 1.000 | 1.936E-03 | 1.936E-03 | 0.277E-03 | 14.32 | |
| ZR-95 | 64.40D | 1.000 | 2.656E-02 | 2.657E-02 | 0.085E-02 | 3.22 | K |
| SB-122 | 2.70D | 1.009 | 1.313E-02 | 1.325E-02 | 0.068E-02 | 5.16 | |
| Total Activity : | | | 7.456E-02 | 7.470E-02 | | | |

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| SR-91 | 9.67H | 1.061 | 4.271E-03 | 4.532E-03 | 0.676E-03 | 14.91 | K |
| Y-93 | 10.30H | 1.057 | 1.583E-02 | 1.674E-02 | 0.591E-02 | 23.37 | |
| MO-99 | 2.76D | 1.009 | 4.639E-02 | 4.679E-02 | 0.248E-02 | 5.30 | |
| TC-99M | 2.76D | 1.009 | 1.471E-03 | 1.484E-03 | 0.262E-03 | 17.63 | |
| RU-106 | 368.20D | 1.000 | 4.082E-02 | 4.082E-02 | 0.407E-02 | 9.98 | |
| CD-109 | 1.24Y | 1.000 | 7.186E-02 | 7.186E-02 | 0.608E-02 | 8.46 | |
| CD-113M | 14.60Y | 1.000 | 6.444E+01 | 6.444E+01 | 0.556E+01 | 8.63 | |
| TE-132 | 3.25D | 1.007 | 1.768E-01 | 1.781E-01 | 0.008E-01 | 0.43 | K |
| CS-134 | 2.06Y | 1.000 | 1.233E-01 | 1.233E-01 | 0.008E-01 | 0.63 | |
| CS-136 | 12.98D | 1.002 | 4.158E-02 | 4.165E-02 | 0.114E-02 | 2.74 | |
| CS-137 | 30.10Y | 1.000 | 1.135E-01 | 1.135E-01 | 0.007E-01 | 0.62 | |
| Total Activity : | | | 6.508E+01 | 6.508E+01 | | | |

Summary of Nuclide Activity (continued)
Sample ID : 2 RCS Liquid

Page : 0
Acquisition date : 10-OCT-1991 06:33:42

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| I-131 | 8.04D | 1.003 | 6.265E-01 | 6.284E-01 | 0.014E-01 | 0.22 | |
| I-132 | 2.38H | 1.271 | 1.768E-01 | 2.247E-01 | 0.001E+00 | 0.43 | |
| I-133 | 20.30H | 1.029 | 3.920E-01 | 4.033E-01 | 0.011E-01 | 0.27 | |
| I-135 | 6.61H | 1.091 | 1.025E-01 | 1.117E-01 | 0.020E-01 | 1.77 | |
| Total Activity : | | | 1.298E+00 | 1.366E+00 | | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| XE-131M | 11.80D | 1.002 | 9.215E-02 | 9.234E-02 | 1.326E-02 | 14.36 | |
| XE-133 | 5.29D | 1.005 | 4.322E-02 | 4.342E-02 | 0.010E-01 | 2.30 | |
| XE-133M | 2.26D | 1.011 | 1.086E-02 | 1.097E-02 | 0.231E-02 | 21.06 | |
| XE-135 | 9.08H | 1.065 | 4.018E-03 | 4.280E-03 | 0.356E-03 | 8.32 | |
| XE-135M | 15.60M | 8.371 | 1.792E-02 | 1.500E-01 | 0.090E-01 | 6.01 | |
| Total Activity : | | | 1.682E-01 | 3.010E-01 | | | |

Grand Total Activity : 6.662E+01 6.683E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 10-OCT-1991 06:00:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 6.284E-01 uCi/ml |
| I-132 | 2.247E-01 uCi/ml |
| I-133 | 4.032E-01 uCi/ml |
| I-134 | 0.000E+00 uCi/ml |
| I-135 | 1.115E-01 uCi/ml |
| Cs-134 | 1.233E-01 uCi/ml |
| Cs-137 | 1.134E-01 uCi/ml |
| I-131DE | 7.548E-01 uCi/ml |
| I-131/I-133 ratio | 1.558E+00 |
| Cs-134/Cs-137 ratio | 1.088E+00 |

VAX/VMS Nuclide Identification Report V2.7 Generated 5-FEB-1992 13:13:46

Configuration : DKB200:[GSDATA]91-05394.CNF;1
 Analyses by : PEAK V16.0,PEAKEFF V2.2,NID V2.3
 Sample title : 24 HR IDE
 Sample date : 10-OCT-1991 18:10:00 Acquisition date : 10-OCT-1991 18:44:32
 Sample ID : 2 RCS Liquid Sample quantity : 10.000 ml
 Sample type : 60 ml bottle Sample geometry : Table 203
 Detector name : HPGe 2 Detector geometry: 60 ml bottle 13
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:32:25.58 7.5%
 Energy tolerance : 1.75 keV Half life ratio : 8.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Spline Efficiencies at : Peak Energy
 Abundance limit : 37.50

Summary of Nuclide Activity

Total number of lines in spectrum 131
 Number of unidentified lines 23
 Number of lines tentatively identified by NID 108 82.44%

Nuclide Type : AP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| NA-24 | 15.03H | 1.040 | 5.285E-04 | 5.496E-04 | 1.088E-04 | 19.80 | |
| CR-51 | 27.70D | 1.001 | 4.170E-03 | 4.174E-03 | 1.360E-03 | 32.58 | |
| CO-58 | 70.78D | 1.000 | 2.333E-02 | 2.333E-02 | 0.025E-02 | 1.05 | |
| FE-59 | 45.10D | 1.001 | 3.139E-03 | 3.140E-03 | 0.202E-03 | 6.44 | K |
| CO-60 | 5.27Y | 1.000 | 1.697E-03 | 1.697E-03 | 0.107E-03 | 6.33 | |
| CU-64 | 12.71H | 1.047 | 7.953E-03 | 8.328E-03 | 13.94E-03 | 167.34 | |
| ZK-95 | 64.40D | 1.000 | 9.384E-04 | 9.387E-04 | 2.358E-04 | 25.12 | |
| AG-110M | 249.90D | 1.000 | 9.368E-04 | 9.369E-04 | 2.103E-04 | 22.44 | K |
| SB-122 | 2.70D | 1.009 | 7.057E-03 | 7.121E-03 | 0.295E-03 | 4.15 | |
| Total Activity : | | | 4.974E-02 | 5.022E-02 | | | |

Nuclide Type : NP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.28E+09Y | 1.000 | 1.224E-03 | 1.224E-03 | 0.488E-03 | 39.86 | |
| Total Activity : | | | 1.224E-03 | 1.224E-03 | | | |

Nuclide Type : AG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| AR-41 | 1.83H | 1.375 | 1.940E-03 | 2.668E-03 | 0.133E-03 | 4.97 | |
| Total Activity : | | | 1.940E-03 | 2.668E-03 | | | |

Summary of Nuclide Activity (continued)
Sample ID : 2 RCS Liquid

Page : 0
Acquisition date : 10-OCT-1991 18:44:32

Nuclide Type : FP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|---------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| SR-91 | 9.67H | 1.062 | 9.742E-04 | 1.035E-03 | 0.283E-03 | 27.33 | K |
| NB-95 | 35.15D | 1.001 | 8.389E-04 | 8.394E-04 | 1.534E-04 | 18.27 | |
| NB-97 | 16.80H | 1.035 | 9.038E-04 | 9.359E-04 | 2.100E-04 | 22.44 | |
| ZR-97 | 16.80H | 1.035 | 8.389E-04 | 8.686E-04 | 1.486E-04 | 17.11 | |
| MO-99 | 2.76D | 1.009 | 1.290E-02 | 1.302E-02 | 0.096E-02 | 7.39 | |
| TC-99M | 2.76D | 1.009 | 8.569E-04 | 8.645E-04 | 1.295E-04 | 14.98 | |
| RU-106 | 368.20D | 1.000 | 2.604E-02 | 2.604E-02 | 0.167E-02 | 6.42 | |
| CD-109 | 1.24Y | 1.000 | 3.287E-02 | 3.287E-02 | 0.402E-02 | 12.24 | |
| CD-113M | 14.60Y | 1.000 | 3.565E+01 | 3.565E+01 | 0.272E+01 | 7.64 | |
| SB-125 | 2.77Y | 1.000 | 1.693E-03 | 1.693E-03 | 0.744E-03 | 43.92 | K |
| TE-132 | 3.25D | 1.008 | 1.194E-01 | 1.203E-01 | 0.004E-01 | 0.33 | K |
| CS-134 | 2.06Y | 1.000 | 5.385E-02 | 6.385E-02 | 0.034E-02 | 0.53 | |
| CS-136 | 12.98D | 1.002 | 2.115E-02 | 2.119E-02 | 0.051E-02 | 2.41 | |
| CS-137 | 30.10Y | 1.000 | 5.778E-02 | 5.778E-02 | 0.032E-02 | 0.55 | |
| BA-139 | 1.42H | 1.509 | 4.986E-03 | 7.524E-03 | 1.014E-03 | 13.47 | |
| BA-140 | 12.79D | 1.002 | 1.113E-02 | 1.115E-02 | 0.099E-02 | 8.89 | |
| Total Activity : | | | 3.600E+01 | 3.601E+01 | | | |

Nuclide Type : HFP

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| I-131 | 8.04D | 1.003 | 2.928E-01 | 2.937E-01 | 0.006E-01 | 0.20 | |
| I-132 | 2.38H | 1.278 | 1.194E-01 | 1.526E-01 | 0.005E-01 | 0.33 | |
| I-133 | 20.30H | 1.029 | 1.289E-01 | 1.327E-01 | 0.004E-01 | 0.32 | |
| I-135 | 6.61H | 1.093 | 1.403E-02 | 1.533E-02 | 0.051E-02 | 3.33 | |
| Total Activity : | | | 5.552E-01 | 5.944E-01 | | | |

Nuclide Type : FG

| Nuclide | Hlife | Decay | Uncorrected UCI/ml | Decay Corr UCI/ml | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|--------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| XE-131M | 11.80D | 1.002 | 4.783E-02 | 4.792E-02 | 0.646E-02 | 13.47 | |
| XE-133 | 5.29D | 1.005 | 2.176E-02 | 2.186E-02 | 0.058E-02 | 2.64 | |
| XE-135 | 9.00H | 1.067 | 4.247E-04 | 4.530E-04 | 1.727E-04 | 38.13 | |
| XE-135M | 15.60M | 8.761 | 2.108E-03 | 1.846E-02 | 0.185E-02 | 10.03 | |
| Total Activity : | | | 7.211E-02 | 8.870E-02 | | | |

Grand Total Activity : 3.668E+01 3.675E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Fission Product Report

Sample ID : 2 RCS Liquid

Sampled : 10-OCT-1991 18:30:00

| Nuclide | Activity |
|---------------------|------------------|
| I-131 | 2.937E-01 uCi/ml |
| I-132 | 1.526E-01 uCi/ml |
| I-133 | 1.327E-01 uCi/ml |
| I-134 | 0.000E+00 uCi/ml |
| I-135 | 1.533E-02 uCi/ml |
| Cs-134 | 6.385E-02 uCi/ml |
| Cs-137 | 5.774E-02 uCi/ml |
| I-131/I-133 ratio | 2.213E+00 |
| Cs-134/Cs-137 ratio | 1.106E+00 |

ATTACHMENT 3

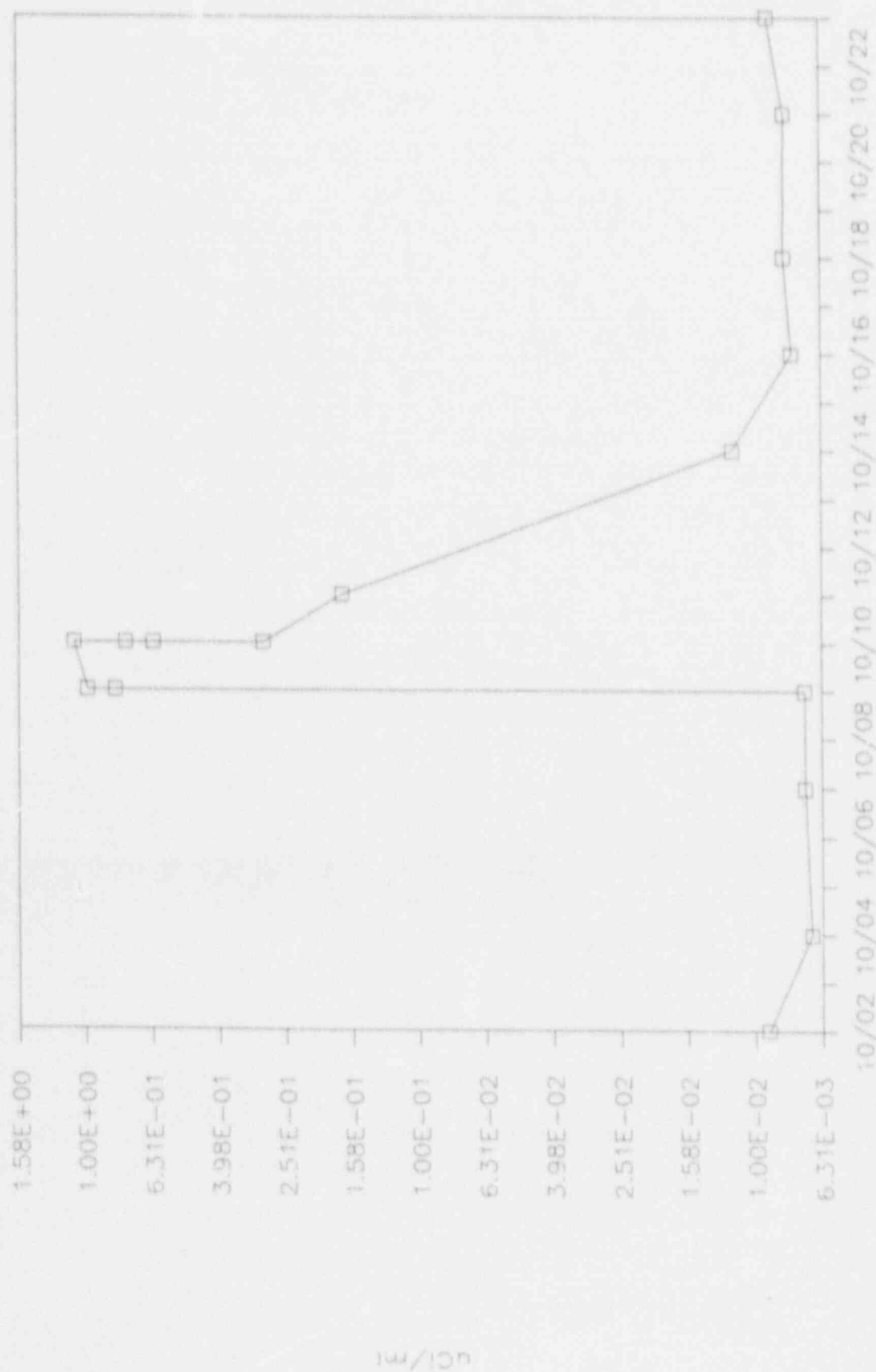
LETDOWN FLOW HISTORY

| <u>DATE</u> | <u>TIME</u> | <u>FLOW RATE</u> |
|------------------|-------------|------------------|
| October 7, 1991 | 0927 | 38.5 gpm |
| October 9, 1991 | 0925 | 36.2 gpm |
| October 9, 1991 | 2000 | 36.2 gpm |
| October 9, 1991 | 2200 | 36.2 gpm |
| October 10, 1991 | 0000 | 82.4 gpm |
| October 10, 1991 | 0000 | 80.0 gpm |
| October 10, 1991 | 0600 | 80.0 gpm |
| October 10, 1991 | 1810 | 80.0 gpm |
| October 11, 1991 | 0910 | 80.0 gpm |
| October 13, 1991 | 0515 | 38.4 gpm |

ATTACHMENT 4

GRAPH OF I-131 AND I-132 CONCENTRATION

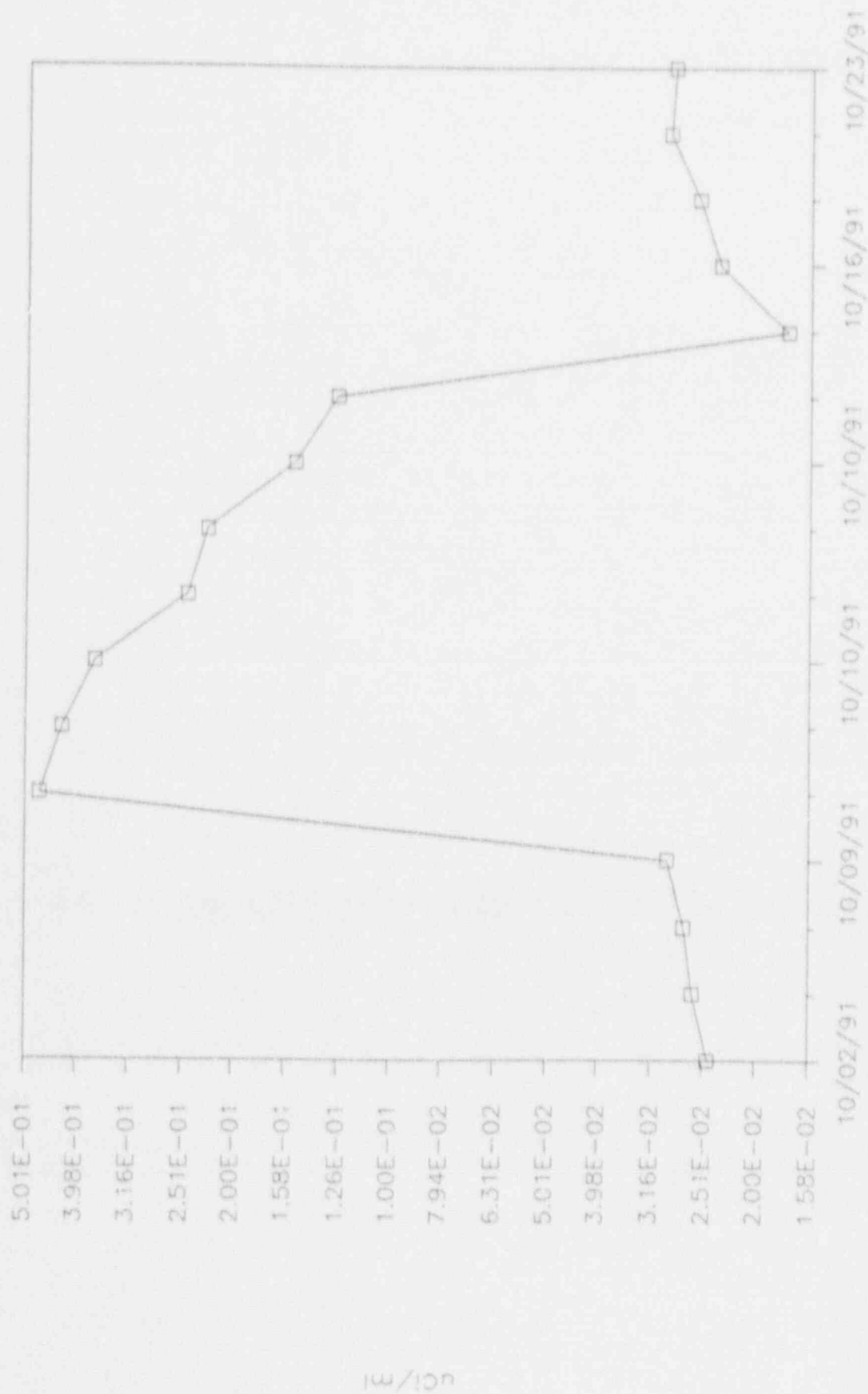
Unit 2 RCS Activity



Date 1991

□ 1-131

2 RCS ACTIVITY



1991

□ 1-132