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INTERNAL TECHNICAL REPORT

Title: MEASURED THERMAL AND FAST NEUTRON FLUENCE RATES
ATR CYCLE 101-B
10/11/93 - 11/27/93

Organization: Radiation Measurements and Development

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MEASURED THERMAL AND FAST NEUTRON FLUENCE RATES
ATR CYCLE 101-B
10/11/93 Thru 11/27/93

R. K. Murray and JW Rogers

This report contains the thermal (2200 m/s) and fast ($E > 1\text{MeV}$) neutron fluence rate data for ATR Cycle 101-B which were measured by the Radiation Measurements Laboratory (RML) as requested by the Power Reactor Programs (ATR Experiments) Radiation Measurements Work Order.

This report contains fluence rate values corresponding to the particular elevations (relative to the 80 ft. core elevation) where the measurements were taken. The data in this report consists of (1) a table of the ATR power history and distribution, (2) a hard copy listing of all thermal and fast neutron fluence rates, (3) plots of both the thermal and fast neutron fluence rates, and (4) a magnetic record (3.5 inch diskette) containing a listing of only the fast neutron fluence rates, their assigned elevations and proper header identification of all monitor positions contained herein.

The fluence rates reported are for the average power levels given in the table of power history and distribution.

All "H" holder monitor wires for this cycle are 54 inches long.

All "SR" holder monitor wires for this cycle are 55 inches long. This length allows measurement of the full core region and makes the first count elevation 24.73 inches above core midplane.

Due to the safety rod problems in the west lobe, "BR" holders were used in the W-1, 2, 3, and 4 positions. All "BR" holder monitor wires for this cycle are 56.25 inches long.

The distance from the end of the wires to the first count position was 4.25 inches for all wires counted from this cycle.

Due to an unretrievable program error the -23.75 inch elevation data of Holder #H-205, position H-10, is not included in the monitor results or on the electronic data disk, however the raw data and calculated activities are listed below.

	<u>Pos.</u>	<u>Total</u>	<u>c/s</u>	<u>net c/s</u>
Co	2450	9.864E+03	3.344E+02	3.322E+02
Ni	2450	3.162E+04	1.072E+03	1.070E+03

The "THERMAL" 2200 m/s CO ($\text{n/cm}^2/\text{sec}$) is computed as $6.936\text{E}+13$.

The "FAST" $>1\text{MeV}$ NI ($\text{n/cm}^2/\text{sec}$) is computed as $3.101\text{E}+13$.

DEFINITIONS OF REPORTED INFORMATION

ON PRINTED PAGES

1. CYCLE: The identification code given to a specific period of operation of the ATR for which the data in this report applies.
2. POSITION: The identification code given to a specific location in the ATR core area where neutron monitors were located and for which the data associated with the code apply. The letter code identifies the lobe and the number code identifies a monitor position.
3. MONITOR ID: The identification code given to a specific neutron monitor holder. The code is stamped on the holder. The letter code identifies the type of holder and the number is unique to allow tracking of the neutron monitors and their data.
4. EFPD: The acronym for, "Effective Full Power Days" which is the effective number of days the ATR operated at the average total core power level of the cycle. This value is obtained from the ATR power history and distribution.
5. AVERAGE MW: The average power level (in megawatts) at which the ATR lobe operated during the cycle. The values used for NW, NE, C, SW, and SE lobes are obtained from the ATR power history and distribution. The values used for the other lobes and core positions are determined as follows:

$$\begin{aligned}N &= (NE + NW + C)/3 \\E &= (NE + SE + C)/3 \\S &= (SE + SW + C)/3 \\W &= (NW + SW + C)/3\end{aligned}$$

$$\begin{aligned}A1 \text{ through } A8 &= C \\A9 &= NE \\A10 &= SE \\A11 &= SW \\A12 &= NW\end{aligned}$$

$$\begin{aligned}B1 \text{ or } B2 &= NE \\B3 \text{ or } B4 &= SE \\B5 \text{ or } B6 &= SW \\B7 \text{ or } B8 &= NW\end{aligned}$$

$$\begin{aligned}B9 &= N \\B10 &= E \\B11 &= S \\B12 &= W\end{aligned}$$

6. DATE: The calendar dates corresponding to the outage and operating time of the cycle. These dates include the forced outage time associated with the cycle as well as the operating time.

7. ELEVATION: The vertical position associated with the neutron fluence rate measurement value relative to the 80 ft. elevation of the ATR core. The elevation values are in inches and negative values are below the 80 ft. elevation (commonly referred to as centerline). The elevation values are established reference elevation points specified as follows:

<u>Holder Type</u>	<u>Reference Elevation</u>	<u>Drawing Numbers</u>
H	77.948 ft.	424852
SR	77.768 ft.	417424
BR-WEST POSITIONS	81.771 ft.	035561

Using the dimensions of the monitor holders, the location of the monitor wire in the holder, the length of the wire and the distance between the measurements along the wire an elevation value for each fluence rate value is determined. An evaluation of the elevation tolerances is listed as follows:

	<u>SR & BR Holders</u>	<u>H Holders</u>
Holder Fabrication	± 0.11 inch	± 0.11 inch
Cutting the Monitor Wire to Length	± 0.01 inch	± 0.01 inch
Wire Alignment in the Holder	± 0.13 inch	± 0.06 inch
Mounting the Wire to the Scanner	± 0.13 inch	± 0.13 inch
Scanning Control	± 0.01 inch	± 0.01 inch
Scanner Home Positioning	± 0.06 inch	± 0.06 inch
Stackup of the Safety Rod Components (estimated)	± 0.33 inch*	
Position of the Safety Rod Relative to 80 ft. (core centerline) during Operation	± 0.75 inch**	
95% Confidence Bound	± 0.78 inch	± 0.19 inch
Maximum Error	± 1.53 inch	± 0.38 inch

These elevation tolerances include only what are considered to be random errors. Systematic errors or biases may also occur due to information input. However, procedural controls are used to minimize this information input error.

*This estimate will be revised after an actual measurement is made.

**This estimate does not include variations due to thermal and hydraulic effects.

8. "THERMAL": The equivalent 2200 m/s (0.025 eV) neutron fluence rate assuming a Maxwellian distribution for the thermalized neutrons at 20.40C. The fluence rate is determined from the Co-59 (n, γ)Co-60 reaction rate assuming a 37 barn 2200 m/s cross section for the reaction. Corrections for the epithermal reaction rate are made based on cadmium ratio measurements at each position of the fluence rate measurement. All fluence rate values are in units of neutrons per sqcm per second.
9. "FAST": The equivalent >1 MeV fission neutron energy fluence rate assuming a pure U-235 fission spectrum neutron energy distribution. The fluence rate is determined from the Ni-58(n,p)Co-58 reaction rate assuming a 0.092 barn fission spectrum averaged cross section for the reaction and a fission spectrum fraction of 0.692 for >1 MeV neutrons. Corrections for the burnout of the Co-58 isomers are made based on the measured 2200 m/s fluence rate, the exposure duration and the burnout cross sections of the isomers [1650 barns (71 days), 1.7 E+5 barns (9.1 hours)] at each position of the fluence rate measurement.
10. CENTERLINE FLU. RATE: The neutron fluence rate at the elevation assignment nearest to the ATR core centerline elevation (0.0).
11. AVG. MAX. FLU. RATE: The average of the highest three adjacent values.
12. MAX. FLU. RATE/MW (AVG.): The average maximum fluence rate divided by the average power level (MW) of the lobe or position.
13. K FACTOR: The conversion factor determined from the neutron monitor activity for converting the net count rate at each elevation to the absolute reaction product (60Co or 58Co) radioactivity per unit mass of the monitor material (d/s/mg).
14. RESONANCE CORRECTION: The fractional correction factor used to correct the Co-59(n, γ)Co-60 reaction rate for the epithermal neutron response at the position where the neutron monitor was located during irradiation. This correction factor was determined from cobalt "cadmium ratio" measurements at the same spatial location for the monitor geometry and atom density.
15. C/L BURNOUT CORRECTION: The correction factor for the burnout (transmutation) of the reaction products (Co-60, Co-58, Co-58m) of the neutron monitors during the cycle irradiation at the centerline fluence rate elevation. The burnout correction factors for other elevation assignments will vary (nonlinearly) depending on the "thermal" neutron fluence rates and cycle durations.
16. BACKGROUND (counts/sec.): The wire scanner detector background environment counting rate at the time the neutron monitor wires were scanned.

17. CHECK SOURCE (counts/sec.)

Date Hour : The wire scanner detector check source count rate on the day the neutron monitor wires were scanned. The check source is a radioactive (^{60}Co) cobalt-aluminum wire mounted in a fixture which reproducibly positions it over the detector collimator. This check source is used to test counting functions (gain and stability) of the scanner counting system. The count rate is corrected for background and decay corrected to 05/01/88, 12:00.

ON PLOTS

18. REACTOR: Identification of the reactor with which the data are associated (normally ATR).
19. CYCLE POWER: The total megawatt days of power produced during the reactor cycle. This value is normally obtained from the ATR power history and distribution information supplied by PRP.
20. MATERIAL: The element name of the neutron monitor material. The "thermal" neutron monitor material is normally an alloy (CoAl) of cobalt (Co) and aluminum (Al) where the weight percent is given preceding the percent (%) symbol.
21. EXPERIMENT: The identification code given to the experiment located in the loop. This information is provided by PRP.

POWER HISTORY AND DISTRIBUTION

CYCLE 101-B
10/11/93 TO 11/27/93

	<u>NW</u>	<u>NE</u>	<u>C</u>	<u>SW</u>	<u>SE</u>	<u>TOTAL MWD</u>
MWd	620	594	835	804	945	3798
EFPD	35					
Eff. Te.	14.01	13.50	18.98	18.27	21.48	
PF	0.400	0.386	0.542	0.522	0.614	
Average Power Level in MW	17.71	16.97	23.86	22.97	27.00	

Total Full Power 108.5 MW

Due to significant down time during this cycle, the following power history was used for fluence rate determinations:

6.75 days @ 112 MW = 1.033 P.F.
2.75 days @ 0 MW = 0 P.F.
28.25 days @ 108.5 MW = 1 P.F.
20.00 days @ 0 MW = 0 P.F.

ATR NEUTRON MONITOR RESULTS

PAGE: 1

CYCLE: 101-B
EFPD: 35.0POSITION: E-1
AVERAGE MW: 22.6MONITOR ID: SR-509
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.09E+13	1.15E+13
22.75	2.07E+13	1.74E+13
20.75	5.59E+13	2.47E+13
18.75	9.13E+13	3.24E+13
16.75	1.25E+14	3.98E+13
14.75	1.55E+14	4.67E+13
12.75	1.76E+14	5.03E+13
10.75	1.92E+14	5.35E+13
8.75	2.05E+14	5.70E+13
6.75	2.20E+14	5.69E+13
4.75	2.27E+14	6.29E+13
2.75	2.30E+14	6.30E+13
0.75	2.33E+14	6.31E+13
-1.25	2.29E+14	6.08E+13
-3.25	2.14E+14	6.31E+13
-5.25	2.02E+14	5.93E+13
-7.25	1.87E+14	5.88E+13
-9.25	1.72E+14	5.40E+13
-11.25	1.60E+14	5.35E+13
-13.25	1.44E+14	4.81E+13
-15.25	1.29E+14	3.96E+13
-17.25	1.10E+14	3.37E+13
-19.25	8.71E+13	2.76E+13
-21.25	6.84E+13	2.06E+13
-23.25	4.97E+13	1.42E+13
-25.25	3.10E+13	7.89E+12

CENTER LINE FLU. RATE	2.33E+14	6.31E+13
AVG. MAX. FLU. RATE	2.31E+14	6.30E+13
MAX. FLU. RATE/MW (AVG.)	1.02E+13	2.79E+12
K FACTOR	1337.02	4019.86
RESONANCE CORRECTION	0.81	NA
C/L. BURNOUT CORRECTION	1.001	2.096
BACKGROUND (COUNTS/SEC.)	2.27	2.27
CHECK SOURCE (COUNTS/SEC.)		
12/09/93 13:47	1762.	1762.

ATR NEUTRON MONITOR RESULTS

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CYCLE: 101-B
EFPD: 35.0POSITION: E-2
AVERAGE MW: 22.6MONITOR ID: SR-510
DATE: 10/11/93 to 11/27/93

ELEVATION from core CL (inches) -----	"THERMAL" 2200 m/s CO (n/cm**2/sec) -----	"FAST" >1 MeV NI (n/cm**2/sec) -----
24.73	1.38E+13	1.95E+13
22.75	2.27E+13	3.35E+13
20.75	6.03E+13	4.78E+13
18.75	9.61E+13	5.90E+13
16.75	1.26E+14	6.60E+13
14.75	1.53E+14	8.08E+13
12.75	1.76E+14	8.50E+13
10.75	1.93E+14	1.04E+14
8.75	2.11E+14	1.10E+14
6.75	2.24E+14	1.14E+14
4.75	2.32E+14	1.12E+14
2.75	2.40E+14	1.15E+14
0.75	2.41E+14	1.20E+14
-1.25	2.33E+14	1.17E+14
-3.25	2.18E+14	1.21E+14
-5.25	2.03E+14	1.15E+14
-7.25	1.95E+14	1.07E+14
-9.25	1.77E+14	1.03E+14
-11.25	1.64E+14	9.60E+13
-13.25	1.47E+14	8.74E+13
-15.25	1.31E+14	7.81E+13
-17.25	1.12E+14	6.40E+13
-19.25	9.05E+13	5.31E+13
-21.25	7.16E+13	3.75E+13
-23.25	5.74E+13	2.31E+13
-25.25	4.11E+13	1.21E+13

CENTER LINE FLU. RATE	2.41E+14	1.20E+14
AVG. MAX. FLU. RATE	2.38E+14	1.19E+14
MAX. FLU. RATE/MW (AVG.)	1.05E+13	5.26E+12
K FACTOR	1318.27	4101.68
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.134
BACKGROUND (COUNTS/SEC.)	2.66	2.66
CHECK SOURCE (COUNTS/SEC.)		
12/10/93 09:10	1777.	1777.

ATR NEUTRON MONITOR RESULTS

PAGE: 3

CYCLE: 101-B
EFPD: 35.0POSITION: E-3
AVERAGE MW: 22.6MONITOR ID: SR-511
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.50E+13	2.44E+13
22.75	2.35E+13	4.21E+13
20.75	6.00E+13	6.20E+13
18.75	9.45E+13	7.86E+13
16.75	1.28E+14	9.87E+13
14.75	1.61E+14	1.10E+14
12.75	1.85E+14	1.24E+14
10.75	2.01E+14	1.34E+14
8.75	2.17E+14	1.42E+14
6.75	2.29E+14	1.48E+14
4.75	2.35E+14	1.52E+14
2.75	2.36E+14	1.52E+14
0.75	2.43E+14	1.55E+14
-1.25	2.37E+14	1.53E+14
-3.25	2.19E+14	1.51E+14
-5.25	2.11E+14	1.50E+14
-7.25	1.97E+14	1.42E+14
-9.25	1.86E+14	1.32E+14
-11.25	1.71E+14	1.21E+14
-13.25	1.54E+14	1.16E+14
-15.25	1.37E+14	1.04E+14
-17.25	1.16E+14	8.75E+13
-19.25	9.29E+13	7.18E+13
-21.25	7.10E+13	4.99E+13
-23.25	6.52E+13	3.19E+13
-25.25	4.81E+13	1.46E+13

CENTER LINE FLU. RATE	2.43E+14	1.55E+14
AVG. MAX. FLU. RATE	2.38E+14	1.53E+14
MAX. FLU. RATE/MW (AVG.)	1.05E+13	6.77E+12
K FACTOR	1334.99	3968.88
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.141
BACKGROUND (COUNTS/SEC.)	2.08	2.08
CHECK SOURCE (COUNTS/SEC.)		
12/13/93 09:15	1782.	1782.

ATR NEUTRON MONITOR RESULTS

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CYCLE: 101-B
EFPD: 35.0POSITION: E-4
AVERAGE MW: 22.6MONITOR ID: SR-512
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.30E+13	2.03E+13
22.75	2.09E+13	3.41E+13
20.75	5.28E+13	5.00E+13
18.75	8.15E+13	6.31E+13
16.75	1.14E+14	7.56E+13
14.75	1.40E+14	8.91E+13
12.75	1.59E+14	9.45E+13
10.75	1.75E+14	1.06E+14
8.75	1.86E+14	1.11E+14
6.75	1.99E+14	1.17E+14
4.75	2.05E+14	1.20E+14
2.75	2.09E+14	1.22E+14
0.75	2.11E+14	1.22E+14
-1.25	2.04E+14	1.22E+14
-3.25	1.89E+14	1.23E+14
-5.25	1.81E+14	1.20E+14
-7.25	1.68E+14	1.15E+14
-9.25	1.57E+14	1.05E+14
-11.25	1.45E+14	1.02E+14
-13.25	1.31E+14	9.61E+13
-15.25	1.14E+14	7.76E+13
-17.25	9.62E+13	6.78E+13
-19.25	7.99E+13	5.51E+13
-21.25	6.11E+13	4.08E+13
-23.25	5.24E+13	2.37E+13
-25.25	3.79E+13	1.15E+13

CENTER LINE FLU. RATE	2.11E+14	1.22E+14
AVG. MAX. FLU. RATE	2.08E+14	1.22E+14
MAX. FLU. RATE/MW (AVG.)	9.22E+12	5.41E+12
K FACTOR	1340.86	3984.56
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	1.989
BACKGROUND (COUNTS/SEC.)	2.35	2.35
CHECK SOURCE (COUNTS/SEC.)		
12/10/93 09:10	1777.	1777.

ATR NEUTRON MONITOR RESULTS

PAGE: 5

CYCLE: 101-B
EFPD: 35.0POSITION: SE-1
AVERAGE MW: 27.0MONITOR ID: SR-513
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.13E+13	2.10E+13
22.75	1.89E+13	3.89E+13
20.75	5.19E+13	5.76E+13
18.75	8.65E+13	7.59E+13
16.75	1.21E+14	9.96E+13
14.75	1.41E+14	1.16E+14
12.75	1.61E+14	1.27E+14
10.75	1.88E+14	1.35E+14
8.75	2.07E+14	1.46E+14
6.75	2.20E+14	1.54E+14
4.75	2.25E+14	1.63E+14
2.75	2.24E+14	1.64E+14
0.75	2.27E+14	1.68E+14
-1.25	2.28E+14	1.64E+14
-3.25	2.37E+14	1.63E+14
-5.25	2.35E+14	1.58E+14
-7.25	2.24E+14	1.49E+14
-9.25	2.13E+14	1.41E+14
-11.25	1.97E+14	1.28E+14
-13.25	1.73E+14	1.20E+14
-15.25	1.44E+14	1.06E+14
-17.25	1.17E+14	8.74E+13
-19.25	9.36E+13	7.05E+13
-21.25	6.97E+13	4.98E+13
-23.25	5.66E+13	2.89E+13
-25.25	4.60E+13	1.52E+13

CENTER LINE FLU. RATE	2.27E+14	1.68E+14
AVG. MAX. FLU. RATE	2.33E+14	1.65E+14
MAX. FLU. RATE/MW (AVG.)	8.64E+12	6.12E+12
K FACTOR	1314.08	4079.43
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.063
BACKGROUND (COUNTS/SEC.)	2.32	2.32
CHECK SOURCE (COUNTS/SEC.)		
12/14/93 09:02	1766.	1766.

ATR NEUTRON MONITOR RESULTS

PAGE: 6

CYCLE: 101-B
EFPD: 35.0POSITION: SE-2
AVERAGE MW: 27.0MONITOR ID: SR-514
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.08E+13	2.00E+13
22.75	1.92E+13	3.79E+13
20.75	5.41E+13	5.58E+13
18.75	8.77E+13	7.33E+13
16.75	1.22E+14	9.60E+13
14.75	1.47E+14	1.13E+14
12.75	1.69E+14	1.25E+14
10.75	1.92E+14	1.35E+14
8.75	2.13E+14	1.42E+14
6.75	2.21E+14	1.49E+14
4.75	2.30E+14	1.55E+14
2.75	2.31E+14	1.61E+14
0.75	2.30E+14	1.64E+14
-1.25	2.34E+14	1.59E+14
-3.25	2.37E+14	1.56E+14
-5.25	2.43E+14	1.52E+14
-7.25	2.30E+14	1.44E+14
-9.25	2.24E+14	1.38E+14
-11.25	2.02E+14	1.21E+14
-13.25	1.77E+14	1.14E+14
-15.25	1.47E+14	1.03E+14
-17.25	1.22E+14	8.49E+13
-19.25	9.30E+13	6.35E+13
-21.25	7.21E+13	4.85E+13
-23.25	5.91E+13	2.94E+13
-25.25	4.61E+13	1.30E+13

CENTER LINE FLU. RATE	2.30E+14	1.64E+14
AVG. MAX. FLU. RATE	2.38E+14	1.62E+14
MAX. FLU. RATE/MW (AVG.)	8.81E+12	5.98E+12
K FACTOR	1331.14	3985.93
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.078
BACKGROUND (COUNTS/SEC.)	2.23	2.23
CHECK SOURCE (COUNTS/SEC.)		
12/13/93 09:15	1782.	1782.

ATR NEUTRON MONITOR RESULTS

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CYCLE: 101-B
EFPD: 35.0POSITION: SE-3
AVERAGE MW: 27.0MONITOR ID: SR-515
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.14E+13	2.40E+13
22.75	2.12E+13	4.14E+13
20.75	5.72E+13	6.19E+13
18.75	9.17E+13	7.94E+13
16.75	1.27E+14	1.04E+14
14.75	1.49E+14	1.22E+14
12.75	1.71E+14	1.28E+14
10.75	1.95E+14	1.40E+14
8.75	2.16E+14	1.52E+14
6.75	2.27E+14	1.60E+14
4.75	2.32E+14	1.69E+14
2.75	2.32E+14	1.76E+14
0.75	2.30E+14	1.76E+14
-1.25	2.33E+14	1.76E+14
-3.25	2.41E+14	1.60E+14
-5.25	2.36E+14	1.62E+14
-7.25	2.25E+14	1.47E+14
-9.25	2.16E+14	1.44E+14
-11.25	1.98E+14	1.33E+14
-13.25	1.77E+14	1.24E+14
-15.25	1.43E+14	1.08E+14
-17.25	1.16E+14	9.36E+13
-19.25	9.43E+13	7.00E+13
-21.25	7.51E+13	5.44E+13
-23.25	6.37E+13	3.25E+13
-25.25	4.87E+13	1.50E+13

CENTER LINE FLU. RATE	2.30E+14	1.76E+14
AVG. MAX. FLU. RATE	2.37E+14	1.76E+14
MAX. FLU. RATE/MW (AVG.)	8.77E+12	6.51E+12
K FACTOR	1297.02	4028.47
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.078
BACKGROUND (COUNTS/SEC.)	1.98	1.98
CHECK SOURCE (COUNTS/SEC.)		
12/10/93 09:10	1777.	1777.

ATR NEUTRON MONITOR RESULTS

PAGE: 8

CYCLE: 101-B
EFPD: 35.0POSITION: SE-4
AVERAGE MW: 27.0MONITOR ID: SR-516
DATE: 10/11/93 to 11/27/93

ELEVATION from core CL (inches) -----	"THERMAL" 2200 m/s CO (n/cm**2/sec) -----	"FAST" >1 MeV NI (n/cm**2/sec) -----
24.73	1.29E+13	2.34E+13
22.75	2.11E+13	4.14E+13
20.75	5.98E+13	5.92E+13
18.75	9.82E+13	7.84E+13
16.75	1.28E+14	1.01E+14
14.75	1.49E+14	1.15E+14
12.75	1.71E+14	1.29E+14
10.75	1.96E+14	1.43E+14
8.75	2.15E+14	1.45E+14
6.75	2.25E+14	1.45E+14
4.75	2.31E+14	1.65E+14
2.75	2.29E+14	1.68E+14
0.75	2.29E+14	1.74E+14
-1.25	2.29E+14	1.71E+14
-3.25	2.38E+14	1.69E+14
-5.25	2.32E+14	1.53E+14
-7.25	2.25E+14	1.51E+14
-9.25	2.11E+14	1.41E+14
-11.25	1.98E+14	1.29E+14
-13.25	1.75E+14	1.18E+14
-15.25	1.49E+14	1.10E+14
-17.25	1.20E+14	9.28E+13
-19.25	9.67E+13	7.26E+13
-21.25	7.76E+13	5.11E+13
-23.25	6.22E+13	3.29E+13
-25.25	5.10E+13	1.52E+13

CENTER LINE FLU. RATE	2.29E+14	1.74E+14
AVG. MAX. FLU. RATE	2.33E+14	1.71E+14
MAX. FLU. RATE/MW (AVG.)	8.62E+12	6.35E+12
K FACTOR	1318.34	4011.39
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.075
BACKGROUND (COUNTS/SEC.)	2.05	2.05
CHECK SOURCE (COUNTS/SEC.)		
12/10/93 09:10	1777.	1777.

ATR NEUTRON MONITOR RESULTS

PAGE: 9

CYCLE: 101-B
EFPD: 35.0POSITION: S-1
AVERAGE MW: 24.6MONITOR ID: SR-517
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.55E+13	2.53E+13
22.75	2.71E+13	4.46E+13
20.75	6.99E+13	6.42E+13
18.75	1.14E+14	8.27E+13
16.75	1.52E+14	1.05E+14
14.75	1.76E+14	1.23E+14
12.75	1.94E+14	1.36E+14
10.75	2.14E+14	1.47E+14
8.75	2.29E+14	1.55E+14
6.75	2.40E+14	1.66E+14
4.75	2.53E+14	1.68E+14
2.75	2.71E+14	1.71E+14
0.75	2.72E+14	1.70E+14
-1.25	2.70E+14	1.72E+14
-3.25	2.59E+14	1.67E+14
-5.25	2.44E+14	1.65E+14
-7.25	2.38E+14	1.57E+14
-9.25	2.24E+14	1.50E+14
-11.25	2.00E+14	1.39E+14
-13.25	1.87E+14	1.21E+14
-15.25	1.66E+14	1.15E+14
-17.25	1.44E+14	9.59E+13
-19.25	1.19E+14	7.61E+13
-21.25	9.39E+13	5.71E+13
-23.25	7.64E+13	3.47E+13
-25.25	5.62E+13	1.66E+13

CENTER LINE FLU. RATE	2.72E+14	1.70E+14
AVG. MAX. FLU. RATE	2.71E+14	1.71E+14
MAX. FLU. RATE/MW (AVG.)	1.10E+13	6.95E+12
K FACTOR	1359.50	4089.07
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.002	2.283
BACKGROUND (COUNTS/SEC.)	2.18	2.18
CHECK SOURCE (COUNTS/SEC.)		
12/13/93 09:15	1782.	1782.

ATR NEUTRON MONITOR RESULTS

PAGE: 10

CYCLE: 101-B
EFPD: 35.0POSITION: S-2
AVERAGE MW: 24.6MONITOR ID: SR-518
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.23E+13	1.37E+13
22.75	2.56E+13	2.19E+13
20.75	7.61E+13	3.04E+13
18.75	1.26E+14	3.89E+13
16.75	1.66E+14	4.63E+13
14.75	1.85E+14	5.83E+13
12.75	2.01E+14	6.60E+13
10.75	2.17E+14	7.08E+13
8.75	2.33E+14	7.12E+13
6.75	2.47E+14	7.97E+13
4.75	2.64E+14	7.82E+13
2.75	2.80E+14	8.14E+13
0.75	2.83E+14	8.25E+13
-1.25	2.75E+14	8.08E+13
-3.25	2.64E+14	8.11E+13
-5.25	2.49E+14	7.67E+13
-7.25	2.39E+14	7.38E+13
-9.25	2.28E+14	7.24E+13
-11.25	2.13E+14	6.65E+13
-13.25	1.91E+14	6.17E+13
-15.25	1.71E+14	5.32E+13
-17.25	1.55E+14	4.31E+13
-19.25	1.26E+14	3.57E+13
-21.25	9.94E+13	2.56E+13
-23.25	7.25E+13	1.74E+13
-25.25	4.39E+13	9.48E+12

CENTER LINE FLU. RATE	2.83E+14	8.25E+13
AVG. MAX. FLU. RATE	2.79E+14	8.16E+13
MAX. FLU. RATE/MW (AVG.)	1.14E+13	3.31E+12
K FACTOR	1326.47	4058.70
RESONANCE CORRECTION	0.81	NA
C/L. BURNOUT CORRECTION	1.002	2.340
BACKGROUND (COUNTS/SEC.)	2.18	2.18
CHECK SOURCE (COUNTS/SEC.)		
12/10/93 09:10	1777.	1777.

ATR NEUTRON MONITOR RESULTS

PAGE: 11

CYCLE: 101-B
EFPD: 35.0POSITION: S-3
AVERAGE MW: 24.6MONITOR ID: SR-519
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.32E+13	1.84E+13
22.75	2.41E+13	2.75E+13
20.75	6.88E+13	4.35E+13
18.75	1.13E+14	5.19E+13
16.75	1.47E+14	6.47E+13
14.75	1.64E+14	8.09E+13
12.75	1.81E+14	9.03E+13
10.75	1.94E+14	9.52E+13
8.75	2.10E+14	1.02E+14
6.75	2.20E+14	1.09E+14
4.75	2.31E+14	1.14E+14
2.75	2.47E+14	1.17E+14
0.75	2.49E+14	1.16E+14
-1.25	2.48E+14	1.17E+14
-3.25	2.40E+14	1.14E+14
-5.25	2.26E+14	1.09E+14
-7.25	2.16E+14	9.94E+13
-9.25	2.04E+14	1.01E+14
-11.25	1.86E+14	9.14E+13
-13.25	1.68E+14	8.55E+13
-15.25	1.57E+14	7.49E+13
-17.25	1.36E+14	6.59E+13
-19.25	1.14E+14	5.49E+13
-21.25	8.70E+13	4.13E+13
-23.25	6.69E+13	2.43E+13
-25.25	4.60E+13	1.27E+13

CENTER LINE FLU. RATE	2.49E+14	1.16E+14
AVG. MAX. FLU. RATE	2.48E+14	1.16E+14
MAX. FLU. RATE/MW (AVG.)	1.01E+13	4.73E+12
K FACTOR	1308.80	4090.92
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.002	2.174
BACKGROUND (COUNTS/SEC.)	2.35	2.35
CHECK SOURCE (COUNTS/SEC.)		
12/14/93 09:02	1766.	1766.

ATR NEUTRON MONITOR RESULTS

PAGE: 12

CYCLE: 101-B
EFPD: 35.0POSITION: S-4
AVERAGE MW: 24.6MONITOR ID: SR-520
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

24.73	1.48E+13	2.60E+13
22.75	2.49E+13	4.56E+13
20.75	6.57E+13	6.50E+13
18.75	1.08E+14	8.42E+13
16.75	1.42E+14	1.06E+14
14.75	1.70E+14	1.22E+14
12.75	1.89E+14	1.40E+14
10.75	2.06E+14	1.47E+14
8.75	2.18E+14	1.59E+14
6.75	2.30E+14	1.65E+14
4.75	2.43E+14	1.71E+14
2.75	2.57E+14	1.69E+14
0.75	2.59E+14	1.67E+14
-1.25	2.65E+14	1.79E+14
-3.25	2.51E+14	1.75E+14
-5.25	2.40E+14	1.64E+14
-7.25	2.30E+14	1.58E+14
-9.25	2.19E+14	1.60E+14
-11.25	2.02E+14	1.44E+14
-13.25	1.81E+14	1.33E+14
-15.25	1.64E+14	1.13E+14
-17.25	1.42E+14	9.66E+13
-19.25	1.18E+14	7.99E+13
-21.25	9.41E+13	5.74E+13
-23.25	7.74E+13	3.63E+13
-25.25	6.34E+13	1.59E+13

CENTER LINE FLU. RATE	2.59E+14	1.67E+14
AVG. MAX. FLU. RATE	2.60E+14	1.73E+14
MAX. FLU. RATE/MW (AVG.)	1.06E+13	7.05E+12
K FACTOR	1329.53	4005.99
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.002	2.222
BACKGROUND (COUNTS/SEC.)	1.92	1.92
CHECK SOURCE (COUNTS/SEC.)		
12/13/93 09:15	1782.	1782.

CYCLE: 101-B
EFPD: 35.0

POSITION: W-1
AVERAGE MW: 21.5

MONITOR ID: BR-521
DATE: 10/11/93 to 11/27/93

ELEVATION
from core CL
(inches)

"THERMAL"
2200 m/s CO
(n/cm**2/sec)

"FAST"
>1 MeV NI
(n/cm**2/sec)

20.50	7.81E+13	4.67E+13
19.50	8.95E+13	5.87E+13
17.50	1.19E+14	7.37E+13
15.50	1.42E+14	8.47E+13
13.50	1.58E+14	9.03E+13
11.50	1.76E+14	1.02E+14
9.50	1.86E+14	1.07E+14
7.50	1.96E+14	1.19E+14
5.50	2.06E+14	1.22E+14
3.50	2.14E+14	1.23E+14
1.50	2.36E+14	1.17E+14
-0.50	2.34E+14	1.15E+14
-2.50	2.21E+14	1.22E+14
-4.50	2.12E+14	1.23E+14
-6.50	2.03E+14	1.21E+14
-8.50	1.94E+14	1.19E+14
-10.50	1.84E+14	1.13E+14
-12.50	1.70E+14	1.07E+14
-14.50	1.53E+14	9.52E+13
-16.50	1.32E+14	8.76E+13
-18.50	1.10E+14	7.46E+13
-20.50	9.02E+13	6.12E+13
-22.50	6.96E+13	4.51E+13
-24.50	6.02E+13	2.47E+13
-26.50	4.11E+13	1.13E+13
-28.50	2.22E+13	4.81E+12
-30.48	9.98E+12	2.34E+12

CENTER LINE FLU. RATE	2.34E+14	1.15E+14
AVG. MAX. FLU. RATE	2.30E+14	1.22E+14
MAX. FLU. RATE/MW (AVG.)	1.07E+13	5.67E+12
K FACTOR	1309.95	3937.88
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.097
BACKGROUND (COUNTS/SEC.)	1.85	1.85
CHECK SOURCE (COUNTS/SEC.)		
12/15/93 09:23	1760.	1760.

ATR NEUTRON MONITOR RESULTS

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CYCLE: 101-B
EFPD: 35.0POSITION: W-2
AVERAGE MW: 21.5MONITOR ID: BR-522
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

20.50	7.92E+13	5.48E+13
19.50	8.83E+13	6.30E+13
17.50	1.17E+14	7.79E+13
15.50	1.40E+14	9.15E+13
13.50	1.58E+14	1.09E+14
11.50	1.70E+14	1.16E+14
9.50	1.84E+14	1.22E+14
7.50	1.89E+14	1.32E+14
5.50	2.01E+14	1.33E+14
3.50	2.08E+14	1.36E+14
1.50	2.28E+14	1.40E+14
-0.50	2.26E+14	1.41E+14
-2.50	2.19E+14	1.41E+14
-4.50	2.09E+14	1.33E+14
-6.50	2.01E+14	1.38E+14
-8.50	1.93E+14	1.35E+14
-10.50	1.80E+14	1.20E+14
-12.50	1.71E+14	1.17E+14
-14.50	1.50E+14	1.06E+14
-16.50	1.31E+14	9.79E+13
-18.50	1.10E+14	8.13E+13
-20.50	8.96E+13	6.66E+13
-22.50	6.91E+13	4.95E+13
-24.50	6.01E+13	2.63E+13
-26.50	4.15E+13	1.22E+13
-28.50	2.14E+13	5.48E+12
-30.48	9.72E+12	2.72E+12

CENTER LINE FLU. RATE	2.26E+14	1.41E+14
AVG. MAX. FLU. RATE	2.24E+14	1.41E+14
MAX. FLU. RATE/MW (AVG.)	1.04E+13	6.54E+12
K FACTOR	1339.91	4007.94
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.061
BACKGROUND (COUNTS/SEC.)	1.98	1.98
CHECK SOURCE (COUNTS/SEC.)		
12/15/93 09:23	1760.	1760.

ATR NEUTRON MONITOR RESULTS

PAGE: 15

CYCLE: 101-B
EFPD: 35.0POSITION: W-3
AVERAGE MW: 21.5MONITOR ID: BR-523
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

20.50	8.64E+13	2.58E+13
19.50	9.85E+13	3.07E+13
17.50	1.29E+14	3.93E+13
15.50	1.56E+14	4.61E+13
13.50	1.80E+14	5.73E+13
11.50	1.97E+14	5.91E+13
9.50	2.03E+14	6.23E+13
7.50	2.13E+14	6.50E+13
5.50	2.18E+14	6.76E+13
3.50	2.36E+14	7.12E+13
1.50	2.51E+14	6.82E+13
-0.50	2.52E+14	7.15E+13
-2.50	2.39E+14	7.35E+13
-4.50	2.31E+14	6.93E+13
-6.50	2.19E+14	6.87E+13
-8.50	2.14E+14	6.69E+13
-10.50	2.03E+14	6.46E+13
-12.50	1.90E+14	6.15E+13
-14.50	1.74E+14	5.60E+13
-16.50	1.48E+14	5.03E+13
-18.50	1.25E+14	4.16E+13
-20.50	1.01E+14	3.41E+13
-22.50	7.57E+13	2.48E+13
-24.50	5.48E+13	1.47E+13
-26.50	3.17E+13	7.61E+12
-28.50	1.81E+13	3.77E+12
-30.48	9.81E+12	1.89E+12

CENTER LINE FLU. RATE	2.52E+14	7.15E+13
AVG. MAX. FLU. RATE	2.47E+14	7.14E+13
MAX. FLU. RATE/MW (AVG.)	1.15E+13	3.32E+12
K FACTOR	1308.83	3929.34
RESONANCE CORRECTION	0.81	NA
C/L. BURNOUT CORRECTION	1.002	2.187
BACKGROUND (COUNTS/SEC.)	1.75	1.75
CHECK SOURCE (COUNTS/SEC.)		
12/15/93 09:23	1760.	1760.

ATR NEUTRON MONITOR RESULTS

PAGE: 16

CYCLE: 101-B
EFPD: 35.0POSITION: W-4
AVERAGE MW: 21.5MONITOR ID: BR-524
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

20.50	8.46E+13	2.92E+13
19.50	9.70E+13	3.42E+13
17.50	1.22E+14	4.14E+13
15.50	1.49E+14	4.81E+13
13.50	1.67E+14	5.62E+13
11.50	1.80E+14	6.08E+13
9.50	1.93E+14	6.59E+13
7.50	2.05E+14	6.84E+13
5.50	2.07E+14	6.62E+13
3.50	2.18E+14	7.11E+13
1.50	2.36E+14	6.96E+13
-0.50	2.31E+14	7.05E+13
-2.50	2.25E+14	7.27E+13
-4.50	2.15E+14	7.19E+13
-6.50	2.06E+14	6.85E+13
-8.50	2.00E+14	6.56E+13
-10.50	1.89E+14	6.35E+13
-12.50	1.77E+14	5.97E+13
-14.50	1.59E+14	5.52E+13
-16.50	1.35E+14	4.90E+13
-18.50	1.12E+14	4.06E+13
-20.50	9.16E+13	3.31E+13
-22.50	6.89E+13	2.38E+13
-24.50	4.98E+13	1.40E+13
-26.50	3.06E+13	7.08E+12
-28.50	1.67E+13	3.56E+12
-30.48	8.35E+12	1.79E+12

CENTER LINE FLU. RATE	2.31E+14	7.05E+13
AVG. MAX. FLU. RATE	2.31E+14	7.17E+13
MAX. FLU. RATE/MW (AVG.)	1.07E+13	3.33E+12
K FACTOR	1297.60	3956.77
RESONANCE CORRECTION	0.76	NA
C/L. BURNOUT CORRECTION	1.001	2.085
BACKGROUND (COUNTS/SEC.)	2.08	2.08
CHECK SOURCE (COUNTS/SEC.)		
12/15/93 09:23	1760.	1760.

ATR NEUTRON MONITOR RESULTS

PAGE: 17

CYCLE: 101-B
EFPD: 35.0POSITION: H-2
AVERAGE MW: 23.9MONITOR ID: H-204
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

25.23	5.09E+13	1.90E+13
23.25	5.17E+13	3.31E+13
21.25	6.15E+13	4.88E+13
19.25	7.94E+13	6.08E+13
17.25	9.73E+13	6.99E+13
15.25	1.14E+14	8.19E+13
13.25	1.28E+14	9.46E+13
11.25	1.41E+14	1.01E+14
9.25	1.50E+14	1.09E+14
7.25	1.62E+14	1.13E+14
5.25	1.61E+14	1.16E+14
3.25	1.71E+14	1.21E+14
1.25	1.70E+14	1.21E+14
-0.75	1.68E+14	1.20E+14
-2.75	1.67E+14	1.17E+14
-4.75	1.58E+14	1.17E+14
-6.75	1.57E+14	1.09E+14
-8.75	1.51E+14	1.11E+14
-10.75	1.37E+14	1.06E+14
-12.75	1.25E+14	9.71E+13
-14.75	1.13E+14	8.49E+13
-16.75	9.72E+13	7.22E+13
-18.75	8.48E+13	6.14E+13
-20.75	6.73E+13	5.00E+13
-22.75	6.01E+13	3.65E+13
-23.75	5.61E+13	2.55E+13

CENTER LINE FLU. RATE	1.68E+14	1.20E+14
AVG. MAX. FLU. RATE	1.69E+14	1.21E+14
MAX. FLU. RATE/MW (AVG.)	7.10E+12	5.07E+12
K FACTOR	1329.39	3980.29
RESONANCE CORRECTION	0.75	NA
C/L. BURNOUT CORRECTION	1.001	1.784
BACKGROUND (COUNTS/SEC.)	2.32	2.32
CHECK SOURCE (COUNTS/SEC.)		
12/14/93 09:02	1766.	1766.

ATR NEUTRON MONITOR RESULTS

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CYCLE: 101-B
EFPD: 35.0POSITION: H-10
AVERAGE MW: 23.9MONITOR ID: H-205
DATE: 10/11/93 to 11/27/93ELEVATION
from core CL
(inches)
-----"THERMAL"
2200 m/s CO
(n/cm**2/sec)
-----"FAST"
>1 MeV NI
(n/cm**2/sec)

25.23	5.82E+13	2.14E+13
23.25	6.19E+13	3.99E+13
21.25	7.05E+13	5.23E+13
19.25	8.89E+13	6.81E+13
17.25	1.12E+14	8.01E+13
15.25	1.28E+14	1.03E+14
13.25	1.44E+14	1.11E+14
11.25	1.60E+14	1.26E+14
9.25	1.72E+14	1.40E+14
7.25	1.82E+14	1.49E+14
5.25	1.84E+14	1.54E+14
3.25	1.87E+14	1.56E+14
1.25	1.92E+14	1.56E+14
-0.75	1.93E+14	1.55E+14
-2.75	1.89E+14	1.51E+14
-4.75	1.85E+14	1.51E+14
-6.75	1.81E+14	1.47E+14
-8.75	1.76E+14	1.38E+14
-10.75	1.63E+14	1.29E+14
-12.75	1.46E+14	1.18E+14
-14.75	1.29E+14	1.06E+14
-16.75	1.14E+14	9.64E+13
-18.75	9.60E+13	8.04E+13
-20.75	7.79E+13	6.46E+13
-22.75	6.90E+13	4.14E+13

CENTER LINE FLU. RATE	1.93E+14	1.55E+14
AVG. MAX. FLU. RATE	1.91E+14	1.56E+14
MAX. FLU. RATE/MW (AVG.)	8.02E+12	6.53E+12
K FACTOR	1298.07	4008.98
RESONANCE CORRECTION	0.75	NA
C/L. BURNOUT CORRECTION	1.001	1.904
BACKGROUND (COUNTS/SEC.)	1.88	1.88
CHECK SOURCE (COUNTS/SEC.)		
12/14/93 09:02	1766.	1766.

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-509

POSITION: E-1

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-E

AVG. MAX. FLUENCE RATE: $2.31\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-509

POSITION: E-1

MATERIAL: NICKEL

EXPERIMENT: 2C-E

AVG. MAX. FLUENCE RATE: $6.30\text{E}+13$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-510

POSITION: E-2

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-E

AVG. MAX. FLUENCE RATE: $2.38\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-510

POSITION: E-2

MATERIAL: NICKEL

EXPERIMENT: 2C-E

AVG. MAX. FLUENCE RATE: $1.19\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-511

POSITION: E-3

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-E

AVG. MAX. FLUENCE RATE: $2.38\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-511

POSITION : E-3

MATERIAL : NICKEL

EXPERIMENT : 2C-E

AVG. MAX. FLUENCE RATE : $1.53\text{E}+14$

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-512

POSITION: E-4

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-E

AVG. MAX. FLUENCE RATE: 2.08×10^{14}

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-512

POSITION : E-4

MATERIAL : NICKEL

EXPERIMENT : 2C-E

AVG. MAX. FLUENCE RATE : $1.22\text{E}+14$

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-513

POSITION: SE-1

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2B-SE

AVG. MAX. FLUENCE RATE: 2.33E+14

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-513

POSITION: SE-1

MATERIAL: NICKEL

EXPERIMENT: 2B-SE

AVG. MAX. FLUENCE RATE: $1.65\text{E}+14$

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-514

POSITION: SE-2

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2B-SE

AVG. MAX. FLUENCE RATE: $2.38\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mw

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-514

POSITION: SE-2

MATERIAL: NICKEL

EXPERIMENT: 2B-SE

AVG. MAX. FLUENCE RATE: $1.62\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-515

POSITION: SE-3

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2B-SE

AVG. MAX. FLUENCE RATE: 2.37E+14

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-515

POSITION: SE-3

MATERIAL: NICKEL

EXPERIMENT: 2B-SE

AVG. MAX. FLUENCE RATE: $1.76\text{E}+14$

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-516

POSITION : SE-4

MATERIAL : 0.1059 %COAL

EXPERIMENT : 2B-SE

AVG. MAX. FLUENCE RATE : $2.33\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mw

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-516

POSITION : SE-4

MATERIAL : NICKEL

EXPERIMENT : 2B-SE

AVG. MAX. FLUENCE RATE : $1.71\text{E}+14$

34
AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-517

POSITION: S-1

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-S

AVG. MAX. FLUENCE RATE: $2.71\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-517

POSITION: S-1

MATERIAL: NICKEL

EXPERIMENT: 2C-S

AVG. MAX. FLUENCE RATE: $1.71\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-518

POSITION : S-2

MATERIAL : 0.1059 %COAL

EXPERIMENT : 2C-S

AVG. MAX. FLUENCE RATE : $2.79\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-518

POSITION : S-2

MATERIAL : NICKEL

EXPERIMENT : 2C-S

AVG. MAX. FLUENCE RATE : $8.16\text{E}+13$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-519

POSITION: S-3

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-S

AVG. MAX. FLUENCE RATE: $2.48\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-519

POSITION : S-3

MATERIAL : NICKEL

EXPERIMENT : 2C-S

AVG. MAX. FLUENCE RATE : $1.16\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: SR-520

POSITION: S-4

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2C-S

AVG. MAX. FLUENCE RATE: $2.60\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : SR-520

POSITION : S-4

MATERIAL : NICKEL

EXPERIMENT : 2C-S

AVG. MAX. FLUENCE RATE : $1.73\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-521

POSITION: W-1

MATERIAL: 0.1059 %COAL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: $2.30\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-521

POSITION: W-1

MATERIAL: NICKEL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: $1.22\text{E}+14$

44
AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-522

POSITION: W-2

MATERIAL: 0.1059 %COAL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: 2.24×10^{14}

45
AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-522

POSITION: W-2

MATERIAL: NICKEL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: $1.41\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-523

POSITION: W-3

MATERIAL: 0.1059 %COAL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: $2.47\text{E}+14$

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-523

POSITION: W-3

MATERIAL: NICKEL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: $7.14\text{E}+13$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: BR-524

POSITION: W-4

MATERIAL: 0.1059 %COAL

EXPERIMENT: 1C-W

AVG. MAX. FLUENCE RATE: $2.31\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : BR-524

POSITION : W-4

MATERIAL : NICKEL

EXPERIMENT : 1C-W

AVG. MAX. FLUENCE RATE : $7.17\text{E}+13$

05
AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR: ATR

CYCLE: 101-B

CYCLE POWER: 3797.5 Mwd

DATE: 10/11/93 - 11/27/93

MONITOR NO.: H-204

POSITION: H-2

MATERIAL: 0.1059 %COAL

EXPERIMENT: 2A-C

AVG. MAX. FLUENCE RATE: $1.69\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : H-204

POSITION : H-2

MATERIAL : NICKEL

EXPERIMENT : 2A-C

AVG. MAX. FLUENCE RATE : $1.21\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

THERMAL NEUTRON FLUENCE RATE (2200 m/s)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : H-205

POSITION : H-10

MATERIAL : 0.1059 %COAL

EXPERIMENT : 2A-C

AVG. MAX. FLUENCE RATE : $1.91\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

FAST NEUTRON FLUENCE RATE (> 1 MeV)

REACTOR : ATR

CYCLE : 101-B

CYCLE POWER : 3797.5 Mwd

DATE : 10/11/93 - 11/27/93

MONITOR NO. : H-205

POSITION : H-10

MATERIAL : NICKEL

EXPERIMENT : 2A-C

AVG. MAX. FLUENCE RATE : $1.56\text{E}+14$

AVERAGED VALUES OVER 35.0 DAYS REACTOR OPERATIONS AT 108.5 MW

DATE

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END