

D. Parkson

DAIRYLAND POWER COOPERATIVE

La Crosse, Wisconsin

54601

September 26, 1978

In reply, please refer to LAC-5479

DOCKET NO. 50-409

Mr. James G. Keppler
Regional Director
U. S. Nuclear Regulatory Commission
Directorate of Regulatory Operations
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
SPECIAL REPORT NO. 78-02

- Reference:
- (1) LACBWR Technical Specifications, Section 4.2.2.22, Action g.
 - (2) LACBWR Technical Specifications, Section 3.9.4.1.

Dear Mr. Keppler:

In accordance with the provisions of Reference (1), a special report conforming to the requirements set forth in Reference (2) is submitted covering results of sampling and analysis actions together with additional operational information for five separate occasions when reactor thermal power changed by more than 15% of rated thermal power within one hour while in Operational Condition 1 or 2.

The separate occasions are discussed in Sections as follows:

- Section 1 - July 1, 1978
- Section 2 - August 15, 1978
- Section 3 - August 17, 1978
- Section 4 - August 19, 1978
- Section 5 - August 24, 1978

Each section provides a summary of operating data and radiological data for the time period prior to the thermal power change, along with the results of the additional sampling required.

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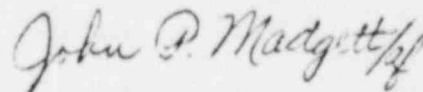
Mr. James G. Keppler, Regional Director
U. S. Nuclear Regulatory Commission

LAC-5479
September 26, 1978

If there are any questions concerning the report, please contact us.

Very truly yours,

DAIRYLAND POWER COOPERATIVE



John P. Madgett, General Manager

JPM:LGP:af

Attachment

cc: Director, Office of Inspection and Enforcement (30)
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Director, Office of Management Information and (3)
Program Control
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SECTION 1

A reactor scram occurred from a power level of 84% at 1530 hours on July 1, 1978. The scram was caused by a spurious neutron flux spike indication which was received on nuclear instrument channel No. 8 which, in turn, caused an indication of a power-to-flow mismatch in power-flow safety channel No. 2. The P/F safety channel operates on a 1 of 2 scram logic.

LACBWR Technical Specifications Section 4.2.2.22, Action g, requires an additional sampling for Iodine 131, Iodine 133 and Iodine 135, as well as specific activity between 2 and 6 hours after the completion of a thermal power change of greater than 15% of rated thermal power within one hour. The Special Report is required to contain the information determined by this additional analysis plus Additional Information as outlined below.

Time of additional sample: 2010 hours on July 1, 1978

Sample results: Gross $\beta\gamma$: 2.21 μ Ci/gram
 I^{131} : 2.01×10^{-2} μ Ci/gram
 I^{133} : 8.83×10^{-2} μ Ci/gram
 I^{135} : 5.94×10^{-2} μ Ci/gram

ADDITIONAL INFORMATION

1. Reactor power level starting 48 hours prior to the thermal power change:

0800-1600 hrs. June 29, 1978:	84.0%
1600-2400 hrs. June 29, 1978:	84.4%
0000-0800 hrs. June 30, 1978:	84.3%
0800-1600 hrs. June 30, 1978:	84.1%
1600-2400 hrs. June 30, 1978:	84.0%
0000-0800 hrs. July 1, 1978:	84.3%
0800-1530 hrs. July 1, 1978:	84.1%

2. The fuel burnup for assemblies in a symmetrical core region is depicted in Figure 1.
3. Cleanup flow history starting 48 hours prior to the thermal power change:

Primary Purification Flow Rate

0800 hrs., June 29, 1978 to 1600 hrs., July 1, 1978: 40.0 gpm

Primary Purification Decontamination Factors ($\beta\gamma$)

June 28, 1978:	777
July 3, 1978:	817

SECTION 1 - (Cont'd)

4. Offgas levels for 48 hours prior to the thermal power change:

0800-1600 hrs., June 29, 1978:	539 Ci/d
1600-2400 hrs., June 29, 1978:	467 Ci/d
0000-0800 hrs., June 30, 1978:	503 Ci/d
0800-1600 hrs., June 30, 1978:	645 Ci/d
1600-2400 hrs., June 30, 1978:	516 Ci/d
0000-0800 hrs., July 1, 1978:	509 Ci/d
0800-1530 hrs., July 1, 1978:	498 Ci/d

5. Gross alpha activity levels for the periods 48 hours before and after the thermal power change:

0230 hrs., June 29, 1978:	5.28×10^{-7} μ Ci/gram
1530 hrs., July 1, 1978:	THERMAL POWER CHANGE
0306 hrs., July 3, 1978:	2.90×10^{-6} μ Ci/gram
0128 hrs., July 10, 1978:	6.68×10^{-7} μ Ci/gram

SECTION 2

A reactor scram occurred from a power level of 81% at 1011 hours on August 15, 1978. The scram was caused by a spurious neutron flux spike indication which was received on nuclear instrument channel No. 8 which, in turn, caused an indication of a power-flow mismatch in power-flow safety channel No. 2. The P/F safety channel operates on a 1 of 2 scram logic.

LACBWR Technical Specifications Section 4.2.2.22, Action g, requires an additional sampling for Iodine 131, Iodine 133 and Iodine 135, as well as specific activity between 2 and 6 hours after the completion of a thermal power change of greater than 15% of rated thermal power within one hour. The Special Report is required to contain the information determined by this additional analysis plus Additional Information as outlined below.

Time of additional sample: 1300 hrs. on August 15, 1978

Sample results: Gross $\beta\gamma$: 1.87 μ Ci/gram
 I^{131} : 2.01×10^{-2} μ Ci/gram
 I^{133} : 4.49×10^{-2} μ Ci/gram
 I^{135} : 5.23×10^{-2} μ Ci/gram

ADDITIONAL INFORMATION

1. Reactor power level starting 48 hours prior to the thermal power change:

0900-1600 hrs., August 13, 1978:	81.0%
1600-2400 hrs., August 13, 1978:	80.9%
0000-0800 hrs., August 14, 1978:	80.8%
0800-1600 hrs., August 14, 1978:	80.6%
1600-2400 hrs., August 14, 1978:	80.5%
0000-0800 hrs., August 15, 1978:	80.1%
0800-1011 hrs., August 15, 1978:	80.0%

SECTION 2 - (Cont'd)

2. The fuel burnup for assemblies in a symmetrical core region is depicted in Figure 2.
3. Cleanup flow history starting 48 hours prior to the thermal power change:

Primary Purification Flow Rate

0800 hrs., August 13, 1978 to 1100 hrs., August 15, 1978: 40 gpm

Primary Purification Decontamination Factors (By)

August 10, 1978:	494
August 14, 1978:	776
August 17, 1978:	1,052

4. Offgas levels for 48 hours prior to the thermal power change:

0800-1600 hrs., August 13, 1978:	476 Ci/d
1600-2400 hrs., August 13, 1978:	495 Ci/d
0000-0800 hrs., August 14, 1978:	463 Ci/d
0800-1600 hrs., August 14, 1978:	463 Ci/d
1600-2400 hrs., August 14, 1978:	476 Ci/d
0000-0800 hrs., August 15, 1978:	468 Ci/d
0800-1011 hrs., August 15, 1978:	468 Ci/d

5. Gross alpha activity levels for the periods 48 hours before and after the thermal power change:

0240 hrs., August 10, 1978:	4.41×10^{-7} μ Ci/gram
0104 hrs., August 14, 1978:	5.13×10^{-7} μ Ci/gram
1011 hrs., August 15, 1978:	THERMAL POWER CHANGE
0416 hrs., August 17, 1978:	6.44×10^{-7} μ Ci/gram
0110 hrs., August 21, 1978:	6.44×10^{-7} μ Ci/gram

SECTION 3

At 0418 hours on August 17, 1978, a manual reactor shutdown was initiated to repair the turbine bypass valve actuator which was leaking hydraulic fluid. The reactor was shut down with all rods inserted at 0623 hours. Prior to shutdown, the reactor had been operating at 33% of rated thermal power.

LACEWR Technical Specifications Section 4.2.2.22, Action g, requires an additional sampling for Iodine 131, Iodine 133 and Iodine 135, as well as specific activity between 2 and 6 hours after the completion of a thermal power change of greater than 15% of rated thermal power within one hour. The Special Report is required to contain the information determined by this additional analysis plus Additional Information as outlined below.

SECTION 3 - (Cont'd)

Time of additional sample: 1025 hrs. on August 17, 1978

Sample results: Gross $\beta\gamma$: 1.01 μ Ci/gram
 I^{131} : 4.27×10^{-2} μ Ci/gram
 I^{133} : 1.37×10^{-2} μ Ci/gram
 I^{135} : 1.28×10^{-2} μ Ci/gram

ADDITIONAL INFORMATION

1. Reactor power level starting 48 hours prior to the thermal power change:

0000-0800 hrs., August 15, 1978: 80.1%
 0800-1011 hrs., August 15, 1978: 80%
 1011-1600 hrs., August 15, 1978: 0%
 1600-2400 hrs., August 15, 1978: 0%
 0000-0800 hrs., August 16, 1978: 0%
 0800-1600 hrs., August 16, 1978: 0% (Reactor startup)
 1600-2400 hrs., August 16, 1978: 0% + 20% (Power escalation)
 0000-0418 hrs., August 17, 1978: 20% + 33% (Power escalation)
 0418-0623 hrs., August 17, 1978: 33% + 0% (Reactor shutdown)

2. The fuel burnup for assemblies in a symmetrical core region is depicted in Figure 3.
3. Cleanup flow history starting 48 hours prior to the thermal power change:

Primary Purification Flow Rate

0000 hrs. - 1100 hrs., August 15, 1978: 40 gpm
 1100 hrs., August 15, 1978 - 1500 hrs., August 16, 1978:
 System Shutdown
 1500 hrs., August 16, 1978 - 0700 hrs., August 17, 1978: 40 gpm

Primary Purification Decontamination Factors ($\beta\gamma$)

August 14, 1978: 776
 August 17, 1978: 1,052
 August 20, 1978: 726

4. Offgas levels for 48 hours prior to the thermal power change:

0000-0800 hrs., August 15, 1978: 468 Ci/d
 0800-1011 hrs., August 15, 1978: 468 Ci/d
 1011-1600 hrs., August 15, 1978: System Shutdown
 1600-2400 hrs., August 15, 1978: System Shutdown
 0000-0800 hrs., August 16, 1978: System Shutdown
 0800-1600 hrs., August 16, 1978: System Shutdown
 1600-2400 hrs., August 16, 1978: 84 Ci/d @ 20% Power
 0000-0418 hrs., August 17, 1978: 228 Ci/d @ 33% Power
 0500 hrs., August 17, 1978: 85 Ci/d De-escalating Power
 0600 hrs., August 17, 1978: 23 Ci/d De-escalating Power

SECTION 3 - (Cont'd)

5. Gross alpha activity levels for the periods 48 hours before and after the thermal power change:

0104 hrs., August 14, 1978: 5.13×10^{-7} μ Ci/gram
 0416 hrs., August 17, 1978: 6.44×10^{-7} μ Ci/gram
 0418 hrs., August 17, 1978: THERMAL POWER CHANGE
 0110 hrs., August 21, 1978: 6.44×10^{-7} μ Ci/gram

SECTION 4

Reactor power escalation was in effect when, at 0829 hours, on August 19, 1978, a reactor scram occurred from a power level of 62%. A malfunctioning electrical-to-pneumatic control relay on a seal injection differential pressure control valve caused the forced circulation pumps to trip on a low seal injection flow signal which, in turn, resulted in a reactor scram.

LACBWR Technical Specifications Section 4.2.2.22, Action g, requires an additional sampling for Iodine 131, Iodine 133 and Iodine 135, as well as specific activity between 2 and 6 hours after the completion of a thermal power change of greater than 15% of rated thermal power within one hour. The Special Report is required to contain the information determined by this additional analysis plus Additional Information as outlined below.

Time of additional sample: 1106 hrs., August 19, 1978

Sample results: Gross β : 1.11 μ Ci/gram
 I^{131} : 4.97×10^{-3} μ Ci/gram
 I^{133} : 7.21×10^{-3} μ Ci/gram
 I^{135} : 8.45×10^{-3} μ Ci/gram

ADDITIONAL INFORMATION

- Reactor power level starting 48 hours prior to the thermal power change:
 - 0800-1035 hrs., August 17, 1978: 0%
 - 1035-1600 hrs., August 17, 1978: 0% to 0.6% Reactor Startup
 - 1600-2400 hrs., August 17, 1978: 0.6% to 26% Power Escalation
 - 0000-0800 hrs., August 18, 1978: 26% to 41% Power Escalation
 - 0800-1600 hrs., August 18, 1978: 41% to 51% Power Escalation
 - 1600-2400 hrs., August 18, 1978: 51% to 57% Power Escalation
 - 0000-0800 hrs., August 19, 1978: 57% to 62% Power Escalation
 - 0800-0829 hrs., August 19, 1978: 62%
- The fuel burnup for assemblies in a symmetrical core region is depicted in Figure 4.
- Cleanup flow history starting 48 hours prior to the thermal power change:

SECTION 4 - (Cont'd)Primary Purification Flow Rate

0700-1500 hrs., August 17, 1978: System Shutdown
 1500 hrs., August 17, 1978 - 1600 hrs., August 18, 1978: 40 gpm
 1600 hrs., August 18, 1978 - 2300 hrs., August 19, 1978:
 System Shutdown

Primary Purification Decontamination Factors (BY)

August 17, 1978: 1,052
 August 20, 1978: 726

4. Offgas level for 48 hours prior to the thermal power change:

0800-1600 hrs., August 17, 1978: System Shutdown
 1600-2400 hrs., August 17, 1978: 101 Ci/d @ ~ 26% Power
 0000-0800 hrs., August 18, 1978: 225 Ci/d @ ~ 41% Power
 0800-1600 hrs., August 18, 1978: 360 Ci/d @ ~ 51% Power
 1600-2400 hrs., August 18, 1978: 497 Ci/d @ ~ 57% Power
 0000-0800 hrs., August 19, 1978: 446 Ci/d @ ~ 62% Power
 0800-0829 hrs., August 19, 1978: 446 Ci/d @ ~ 62% Power

5. Gross alpha activity levels for the periods 48 hours before and after the thermal power change:

0416 hrs., August 17, 1978: 6.44×10^{-7} μ Ci/gram
 0829 hrs., August 19, 1978: THERMAL POWER CHANGE
 0110 hrs., August 21, 1978: 6.44×10^{-7} μ Ci/gram
 0305 hrs., August 24, 1978: 7.34×10^{-7} μ Ci/gram

SECTION 5

A reactor scram occurred from a power level of 80% at 0850 hours on August 24, 1978. The scram was caused by a technician incorrectly inserting a scram signal during performance of wide range power channel No. 6 surveillance testing by opening a test switch on wide range power channel No. 5. The switching inserted a second scram signal into the 2-of-4 logic system with the channel No. 6 scram signal already present.

LACEWR Technical Specifications Section 4.2.2.22, Action g, requires an additional sampling for Iodine-131, Iodine-133 and Iodine-135, as well as specific activity between 2 and 6 hours after the completion of a thermal power change of greater than 15% of rated thermal power within one hour. The Special Report is required to contain the information determined by this additional analysis plus Additional Information as outlined below.

Time of additional sample: 1250 hrs., August 24, 1978

SECTION 5 - (Cont'd)

Sample results: Gross $\beta\gamma$: 1.02 μ Ci/gram
 I^{131} : 6.46×10^{-2} μ Ci/gram
 I^{133} : 4.90×10^{-1} μ Ci/gram
 I^{135} : 5.78×10^{-1} μ Ci/gram

ADDITIONAL INFORMATION

1. Reactor power level starting 48 hours prior to the thermal power change:

0800-1600 hrs., August 22, 1978: 62% to 67% Power Escalation
 1600-2400 hrs., August 22, 1978: 67% to 77% Power Escalation
 0000-0800 hrs., August 23, 1978: 77% to 78% Power Escalation
 0800-1600 hrs., August 23, 1978: 78% to 80% Power Escalation
 1600-2400 hrs., August 23, 1978: 79.7%
 0000-0800 hrs., August 24, 1978: 79.6%
 0800-0850 hrs., August 24, 1978: 80%

2. The fuel burnup for assemblies in a symmetrical core region is depicted in Figure 5.
3. Cleanup flow history starting 48 hours prior to the thermal power change:

Primary Purification Flow Rates

0800-1600 hrs., August 22, 1978: 40 gpm
 1600 hrs., August 22, 1978 - 0800 hrs., August 23, 1978: 40.5 gpm
 0800-1200 hrs., August 23, 1978: 40.8 gpm
 1200 hrs., August 23, 1978 - 0300 hrs., August 24, 1978: 41 gpm
 0300-0500 hrs., August 24, 1978: 40.5 gpm
 0500-0900 hrs., August 24, 1978: 41 gpm

Primary Purification Decontamination Factors ($\beta\gamma$)

August 21, 1978: 726
 August 24, 1978: 867
 August 28, 1978: 1,071

4. Offgas levels for 48 hours prior to the thermal power change:

0800-1600 hrs., August 22, 1978: 506 Ci/d @ ~ 67% Power
 1600-2400 hrs., August 22, 1978: 561 Ci/d @ ~ 77% Power
 0000-0800 hrs., August 23, 1978: 585 Ci/d @ ~ 78% Power
 0800-1600 hrs., August 23, 1978: 647 Ci/d @ ~ 80% Power
 1600-2400 hrs., August 23, 1978: 615 Ci/d
 0000-0800 hrs., August 24, 1978: 627 Ci/d
 0800-0850 hrs., August 24, 1978: 627 Ci/d

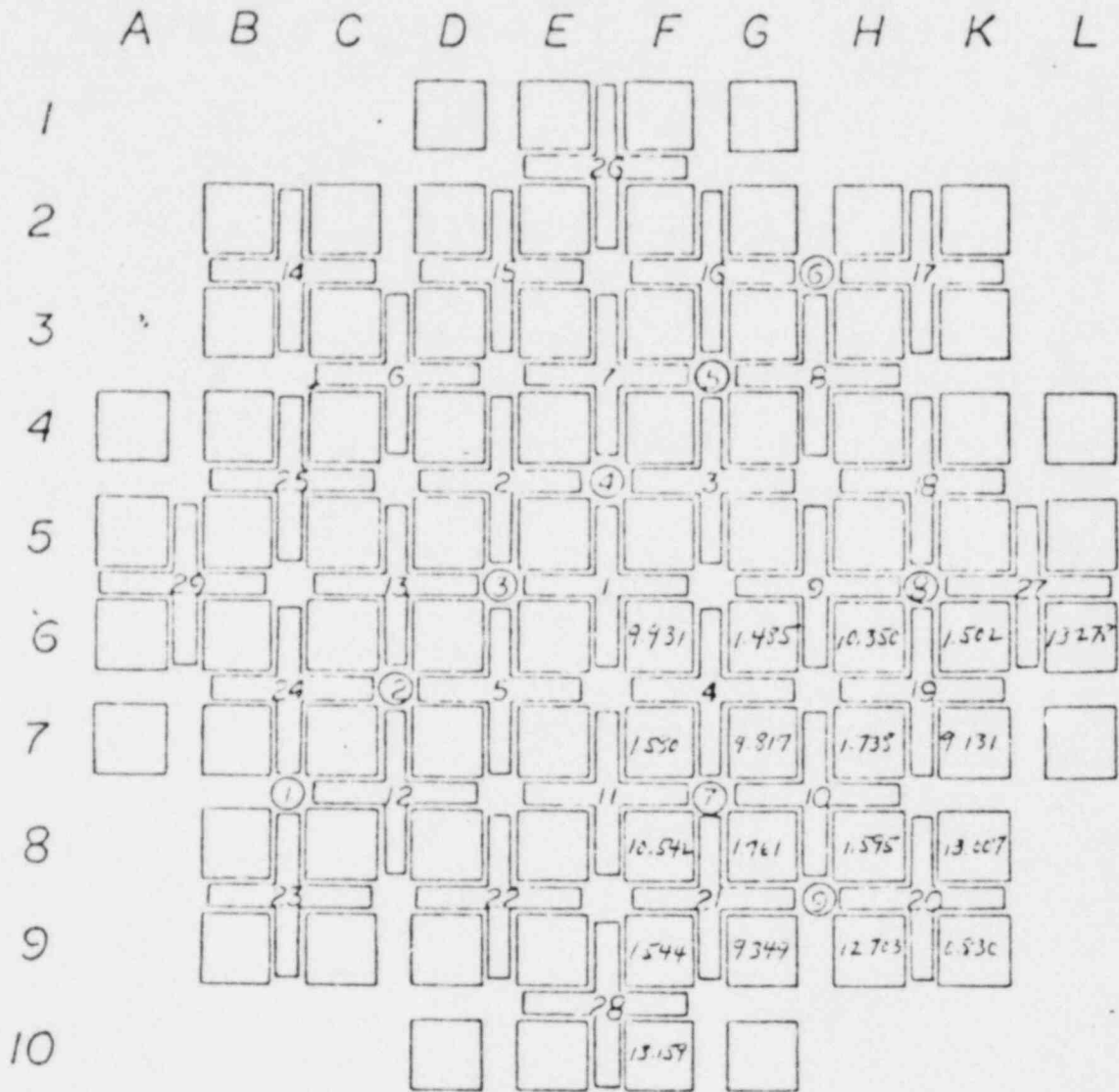
SECTION 5 - (Cont'd)

5. Gross alpha activity levels for the periods 48 hours before and after the thermal power change:

0110 hrs., August 21, 1978:	6.44×10^{-7} μ Ci/gram
0305 hrs., August 24, 1978:	7.37×10^{-7} μ Ci/gram
0850 hrs., August 24, 1978:	THERMAL POWER CHANGE
0046 hrs., August 28, 1978:	5.33×10^{-7} μ Ci/gram

Quarter Core Fuel Exposure Estimations (GWD/MTU)
 as an Indication of Regional Exposure as of July 1, 1978.

Core Average Exposure ~ 7.012 GWD/MTU.



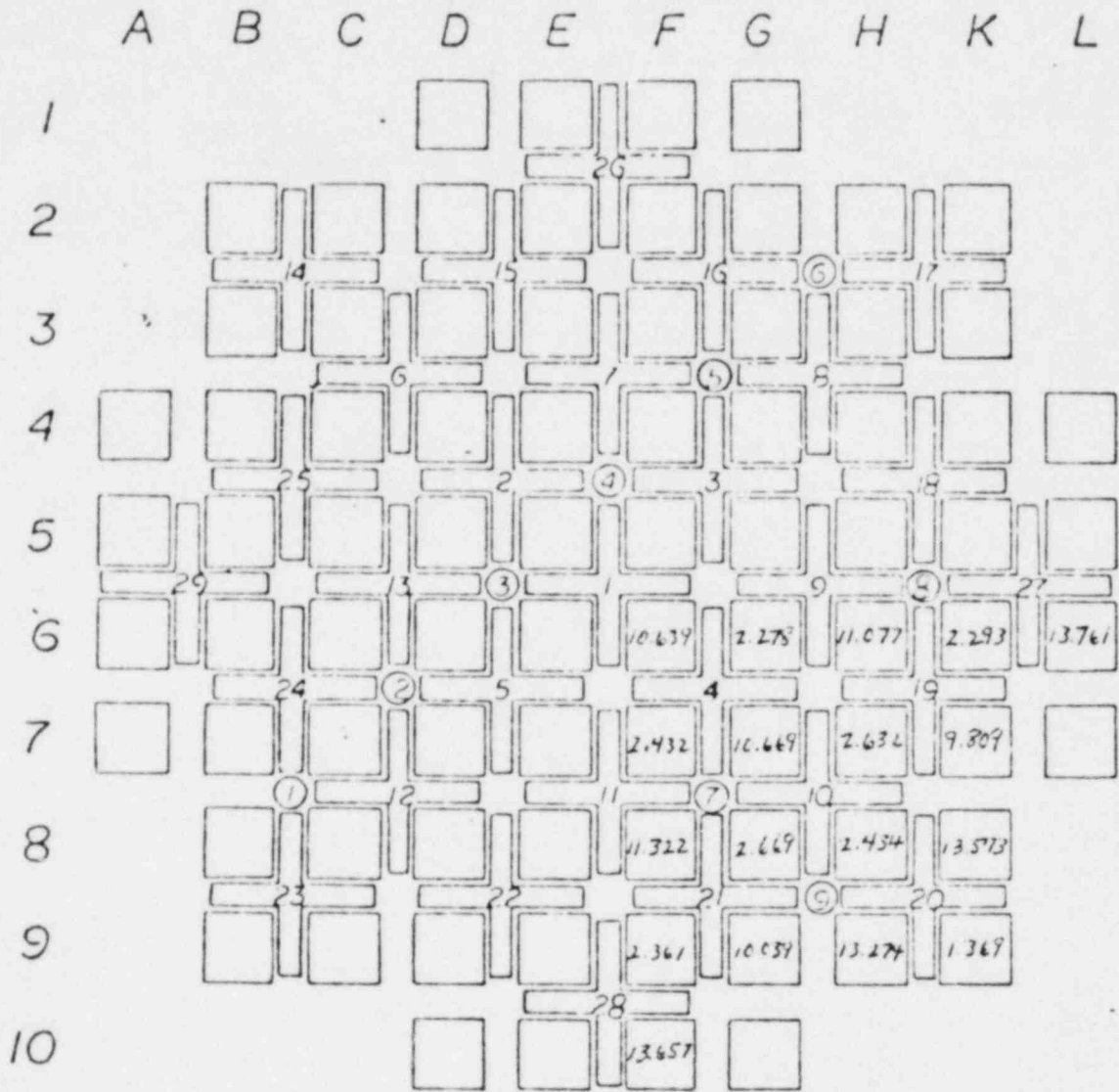
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IN CORE FLUX MONITORS ○

Figure 1

Quarter Core Fuel Exposure Estimations (GWD/MTU)
 as an Indication of Regional Exposure as of August 15, 1978.

Core Average Exposure ~ 7.720 GWD/MTU.



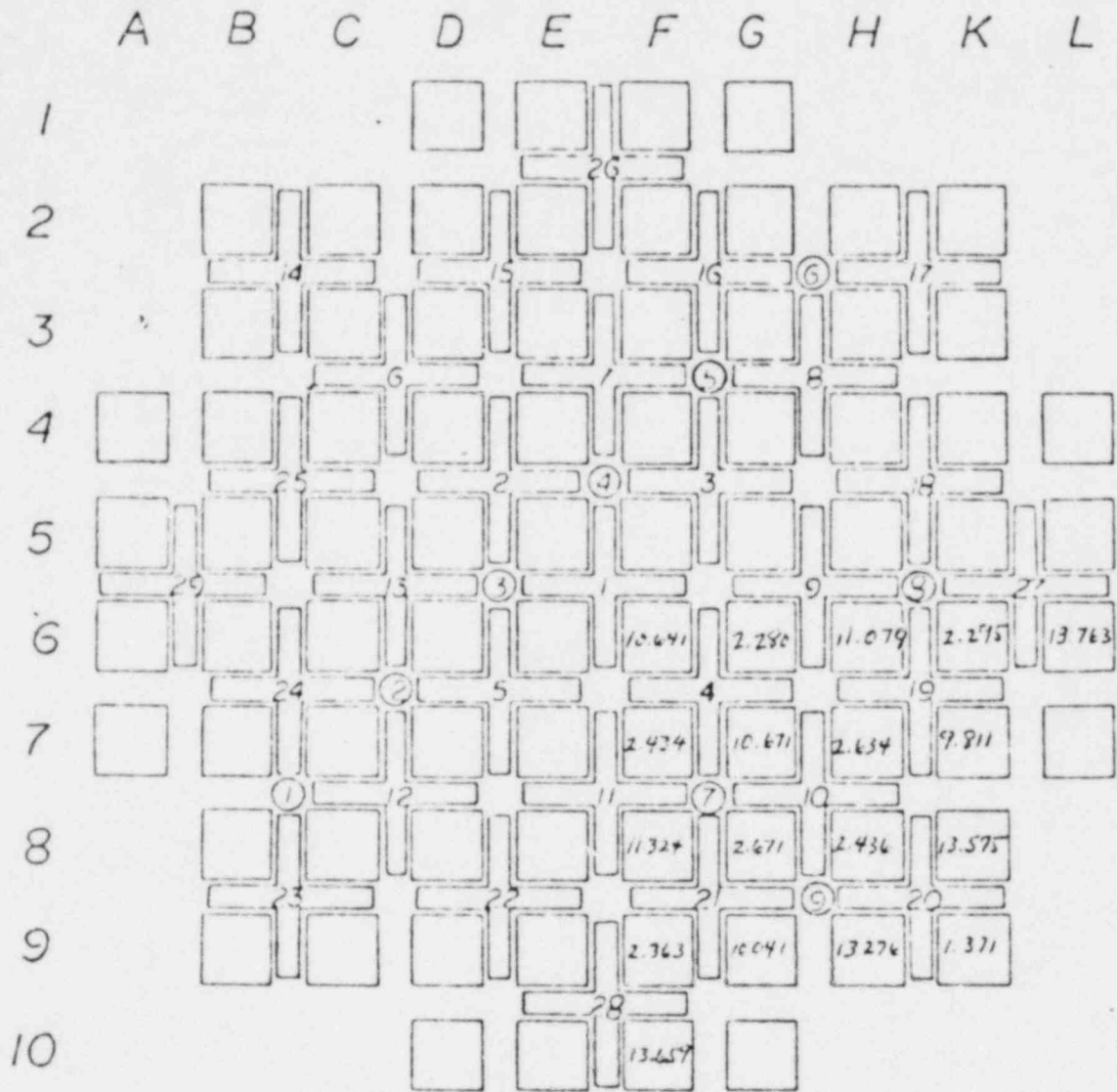
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Figure 2

Quarter Core Fuel Exposure Estimations (GWD/MTU)
 as an Indication of Regional Exposure as of August 17, 1978.

Core Average Exposure ~ 7.722 GWD/MTU.

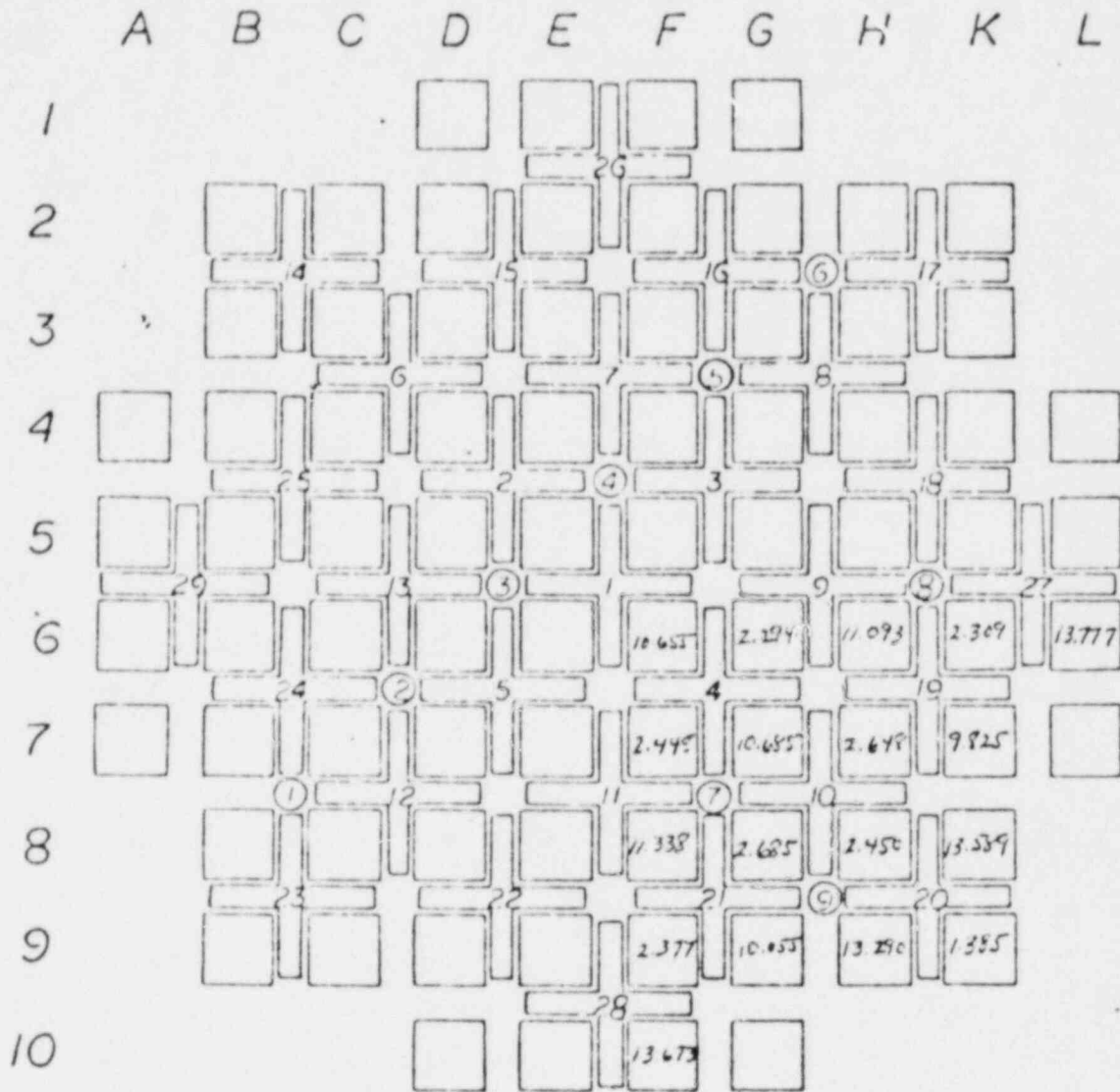


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Figure 3

Quarter Core Fuel Exposure Estimations (GWD/MTU)
 as an Indication of Regional Exposure as of August 19, 1978.
 Core Average Exposure ~ 7.736 GWD/MTU.



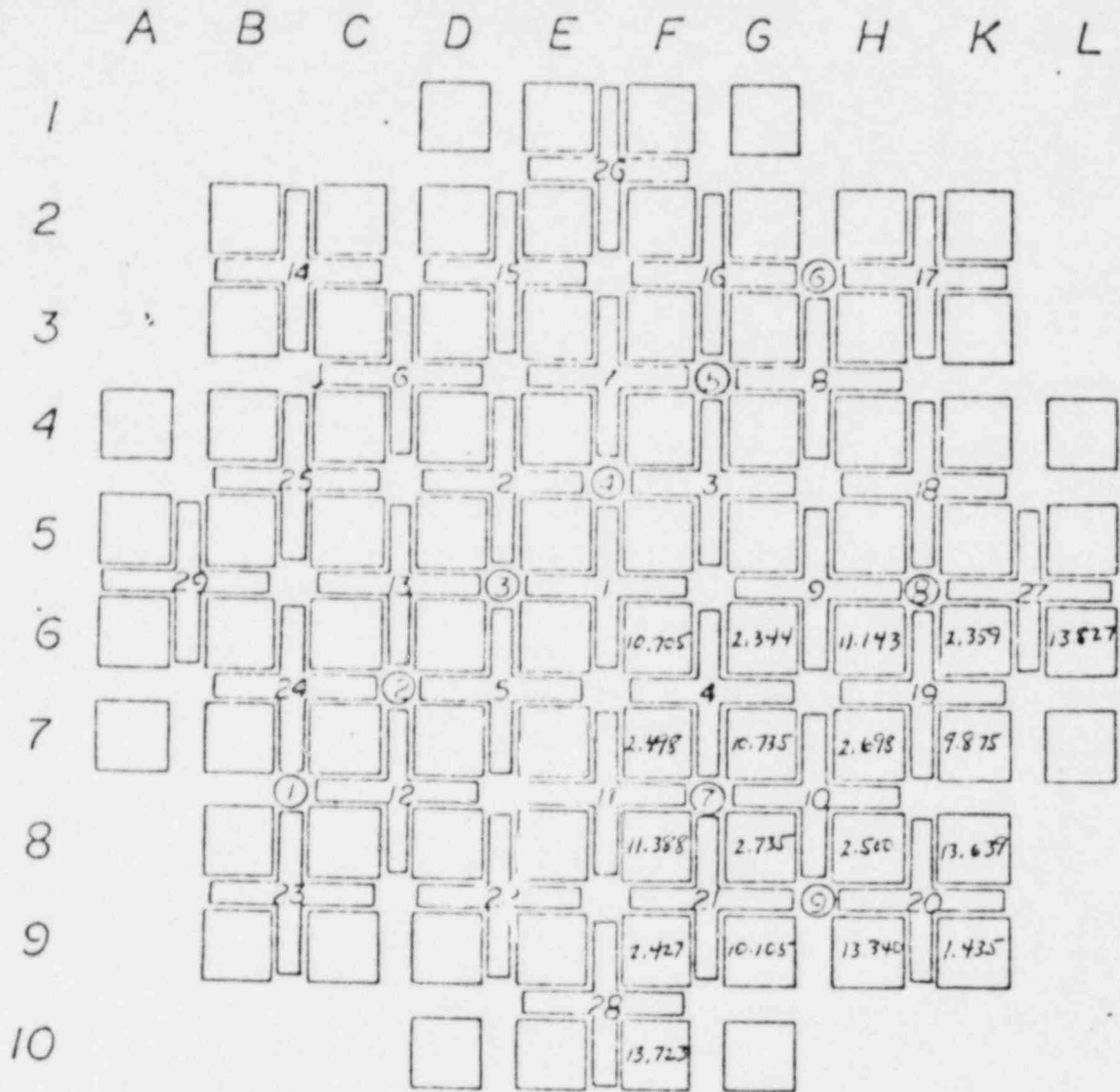
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Figure 4

Quarter Core Fuel Exposure Estimations (GWD/MTU)
 as an Indication of Regional Exposures as of August 24, 1978.

Core Average Exposure ~ 7.786 GWD/MTU.



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Figure 5