

30-315

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

FILE NUMBER
INCIDENT REPORT

TO: J G Keppler

FROM: Indiana & Michigan Pwr Co
Bridgman, Mich
R W JurgensenDATE OF DOCUMENT
1-24-77

DATE RECEIVED 2-15-77

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☒ UNCLASSIFIED

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DESCRIPTION

Ltr trans the following:

1p

PLANT NAME: Cook #1

ENCLOSURE

Licensee Event Report (RO# 76-59) on 12-24-76
concerning excessive dose equivalent of reactor
coolant analysis due to iodine spike following
power transient.....ACKNOWLEDGED
6p

DO NOT REMOVE

NOTE: IF PERSONNEL EXPOSURE IS INVOLVED
SEND DIRECTLY TO KREGER/J. COLLINS

FOR ACTION/INFORMATION..... 2-16-77 ehf

BRANCH CHIEF: Ziemann

W/3 CYS FOR ACTION

LIC. ASST.: Diggs

W/1 CYS

ACRS 16 CYS HOLDING/SENT - AS CAT B 2/15/77

INTERNAL DISTRIBUTION

REG FILE

NRC PDR

I & E (2)

MIPC

SCHROEDER/IPPOLITO

HOUSTON

NOVAK/CHECK

GRIMES

CASE

BUTLER

HANAUER

TEDESCO/MACCARY

EISENHUT

BAER

SHAO

VOLLMER/BUNCH

KREGER/J. COLLINS

EXTERNAL DISTRIBUTION

LPDR: St Joseph, M.

TIC:

NSIC:

CONTROL NUMBER

1602 o/b
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D. K. Ankam



INDIANA & MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT
P.O. Box 458, Bridgman, Michigan 49106

January 24, 1977

Mr. J. G. Keppler, Regional Director
Office of Inspection and Enforcement
United States Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137



Operating License DPR-58
Docket No. 50-315

Dear Mr. Keppler:

Pursuant to the requirements of Appendix A Technical Specifications and the United States Nuclear Regulatory Commission Regulatory Guide 1.16, Revision 4, Section 2.b, the following report is submitted:

RO-50-315/76-59

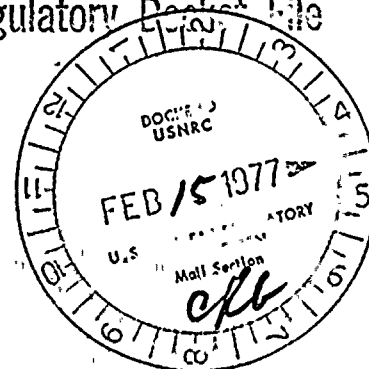
Sincerely,

R. W. Jurgensen
R. W. Jurgensen
Plant Manager

RWJ/mj

cc: R. S. Hunter
J. E. Dolan
G. E. Lien
R. Kilburn
R. J. Vollen BPI
R. C. Callen MPSC
K. R. Baker RO: III
R. Walsh, Esq.
P. W. Steketee, Esq.
G. Charnoff, Esq.
G. Olson
J. M. Hennigan
PNSRC
R. S. Keith
Dir., IE (30 copies)
Dir., MIPC (3 copies)

Regulatory Docket File



1602

JAN 26 1977

LICENSEE EVENT REPORT

CONTROL BLOCK: 1 6

(PLEASE PRINT ALL REQUIRED INFORMATION)

<p>LICENSEE NAME</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 01 M I D C C 1 </div> <p style="text-align: center;">7 8 9 14</p>	<p>LICENSE NUMBER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 00 00000000 </div> <p style="text-align: center;">15 25</p>	<p>LICENSE TYPE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 41 1111 </div> <p style="text-align: center;">26 30</p>	<p>EVENT TYPE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 03 </div> <p style="text-align: center;">31 32</p>
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<p>REPORT TYPE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 01 </div> <p style="text-align: center;">7 8</p>	<p>CATEGORY</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> CONT </div> <p style="text-align: center;">57 58</p>	<p>REPORT SOURCE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> L </div> <p style="text-align: center;">59 60</p>	<p>DOCKET NUMBER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 050 0315 </div> <p style="text-align: center;">61 68</p>	<p>EVENT DATE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 122 476 </div> <p style="text-align: center;">69 74</p>	<p>REPORT DATE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 012 477 </div> <p style="text-align: center;">75 80</p>
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EVENT DESCRIPTION

02 ON DECEMBER 23, 1976, AT 2100 HOURS POWER REDUCTION WAS STARTED WITH THE UNIT TRIPPED

03 FROM APPROXIMATELY 7% AT 0008 HOURS ON DECEMBER 24, 1976. REACTOR COOLANT ANALYSIS

04 SHOWED DOSE EQUIVALENT I-131 ACTIVITY TO BE 3.1 µCi/gm. THIS IS IN EXCESS OF LIMIT

05 SPECIFIED IN TECHNICAL SPECIFICATION 3.4.8. THIS LIMIT WAS EXCEEDED PREVIOUSLY,

06 RO-50-315/76-52, ON NOVEMBER 20, 1976. (RO-50-315/76-59)

<p>SYSTEM CODE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z Z </div> <p style="text-align: center;">7 8 9 10</p>	<p>CAUSE CODE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> F </div> <p style="text-align: center;">11</p>	<p>COMPONENT CODE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z Z Z Z Z Z </div> <p style="text-align: center;">12 17</p>	<p>PRIME COMPONENT SUPPLIER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z </div> <p style="text-align: center;">43</p>	<p>COMPONENT MANUFACTURER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> X 9 9 9 </div> <p style="text-align: center;">44 47</p>	<p>VIOLATION</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> N </div> <p style="text-align: center;">48</p>
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CAUSE DESCRIPTION

08 SEE SUPPLEMENT

09

10

<p>FACILITY STATUS</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> G </div> <p style="text-align: center;">7 8 9</p>	<p>% POWER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 000 </div> <p style="text-align: center;">10 12 13</p>	<p>OTHER STATUS</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> NA </div> <p style="text-align: center;">44</p>	<p>METHOD OF DISCOVERY</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> B </div> <p style="text-align: center;">45</p>	<p>DISCOVERY DESCRIPTION</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> ROUTINE SAMPLING </div> <p style="text-align: center;">46 80</p>
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<p>FORM OF ACTIVITY RELEASED</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z </div> <p style="text-align: center;">7 8 9</p>	<p>CONTENT OF RELEASE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z </div> <p style="text-align: center;">10 11</p>	<p>AMOUNT OF ACTIVITY</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> NA </div> <p style="text-align: center;">44 45</p>	<p>LOCATION OF RELEASE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> NA </div> <p style="text-align: center;">80</p>
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PERSONNEL EXPOSURES

<p>NUMBER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 000 </div> <p style="text-align: center;">7 8 9 11</p>	<p>TYPE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z </div> <p style="text-align: center;">12</p>	<p>DESCRIPTION</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> NA </div> <p style="text-align: center;">13 80</p>
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PERSONNEL INJURIES

<p>NUMBER</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> 000 </div> <p style="text-align: center;">7 8 9 11 12</p>	<p>DESCRIPTION</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> NA </div> <p style="text-align: center;">80</p>
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PROBABLE CONSEQUENCES

15 NA

LOSS OR DAMAGE TO FACILITY

<p>TYPE</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> Z </div> <p style="text-align: center;">7 8 9 10</p>	<p>DESCRIPTION</p> <div style="border: 1px solid black; padding: 2px; display: flex; justify-content: space-between;"> NA </div> <p style="text-align: center;">80</p>
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PUBLICITY

17 NA

ADDITIONAL FACTORS

18 NA

19 NA

NAME: J.L.RISCHLING

PHONE: (616)465-5901(368)

INDIANA & MICHIGAN POWER COMPANY
DONALD C. COOK NUCLEAR PLANTIodine Spike Following Power Transient

As this shutdown was planned, and, due to the iodine spiking noted following reactor trip on November 20, 1976, a revised sampling program had been set up to increase the data collection frequency. This program consisted of collecting samples each two hours prior to unit shutdown, each half hour for the first four hours following reactor trip and each two hours after that period until data stabilized.

Reactor power had been slowly decreasing during the week prior to shutdown due to core stretch out, with power in the 90% range 48 hours prior to the first out-of-specification sample.* On December 23, 1976, at 2100 hours, reactor power reduction was started with the unit tripped from approximately 7% power at 0008 hours on December 24, 1976. In preparation for shutdown, CVCS purification flow had been increased to maximum (120-125 gpm) on December 13, 1976, and maintained at this level through shutdown.* Volume control tank hydrogen pressure was reduced at 1330 hours on December 23, 1976, in preparation for degassing of the system with remaining degassing operations (VCT level increase and venting to the gas header) starting at 1820 hours on December 24, 1976, with three tank purges completed by 0030 hours on December 25, 1976.

Primary coolant I-131 activity following return to equilibrium after the November 30, 1976 reactor trip had stabilized at $1.5\text{--}2.0 \times 10^{-2}$ $\mu\text{Ci/cc}$.¹ I-131 activity remained at this level until 0000 hours on December 24, 1976 when the activity increased to 2.5 $\mu\text{Ci/cc}$, approximately 3 hours following initiation of power reduction. Iodine release at this time period is consistent with data reported in Westinghouse Electric Corporation WCAP-8637, "Iodine Behavior Under Transient Conditions in the Pressurized Water Reactor." The increased data collection sampling frequency after the spike indicates that the I-131 activity began decreasing immediately following the initial spike with values remaining constant at approximately 1.6 $\mu\text{Ci/cc}$ for an 8 - 10 hour period before further decrease (See Figure 2). I-133, 135 values showed trends similar to the I-131 activity (Figure 3). DOSE EQUIVALENT I-131 values peaked at 3.1 $\mu\text{Ci/gm}$ at 0000 hours on December 24, 1976, with values exceeding the 1.0 $\mu\text{Ci/gm}$ specification for 24 hours after the spike. DOSE EQUIVALENT I-131 values were in the "Acceptable Operation" portion of Technical Specifications Figure 3.4-1 at all times during the transient.*

Fuel burnup by core region is indicated in Table 1.

As iodine values began decreasing immediately following the spike and have remained at low values during fuel movement operations (1.5×10^{-4} $\mu\text{Ci/cc}$) and with all data similar to that following the November 20, 1976, incident, the December 24, 1976 spike is also attributed to the normal spiking phenomena during power transients rather than fuel clad failure. No iodine spiking was noted during depressurization of the reactor coolant system.

* See Figure 1

¹ Coolant samples are brought to ambient conditions before counting; therefore, units of $\mu\text{Ci/cc}$ and $\mu\text{Ci/gm}$ are interchangeable.

INDIANA & MICHIGAN POWER COMPANY
DONALD C. COOK NUCLEAR PLANT

TABLE 1

FUEL BURNUP BY CORE REGION

REGION NO.	BURNUP FOR PERIOD	CUMULATIVE BURNUP	ENERGY FOR PERIOD	CUMULATIVE ENERGY
	<u>(MWD/MTU)</u>	<u>(MWD/MTU)</u>	<u>(BTU)</u>	<u>(BTU)</u>
1.	0.3023E+04	0.1894+05	0.7285+13	0.6565+14
2.	0.3272+04	0.1915+05	0.7803+13	0.4566+14
3.	0.2375+04	0.1350+05	0.5632+13	0.3201+14
Core Total	0.2891+04	0.1721+05	0.2072+14	0.1233+15

Period: October 1, 1976 - December 30, 1976

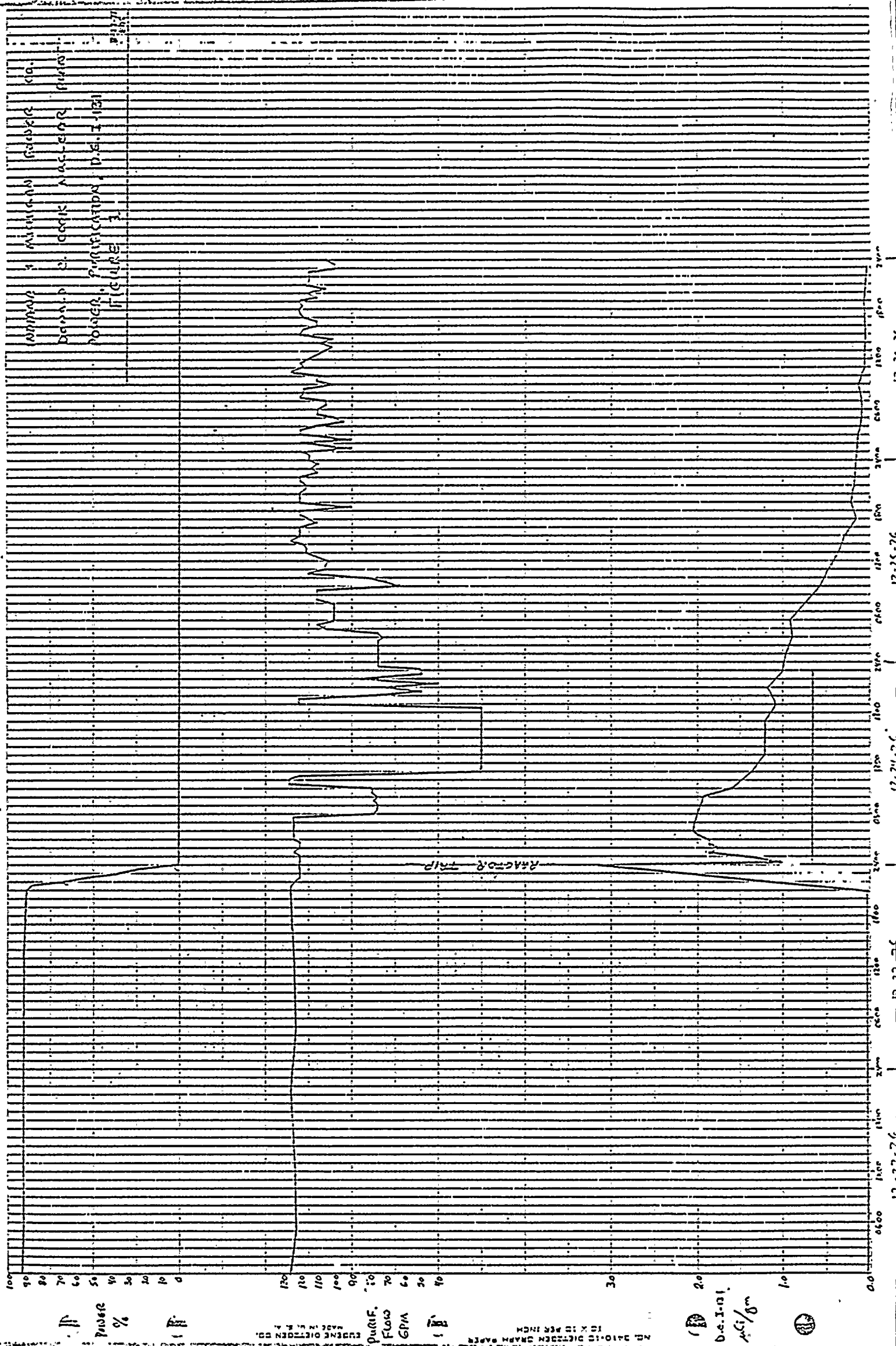
INDIANA & MICHIGAN POWER COMPANY
DONALD C. COOK NUCLEAR PLANT

TABLE 1

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1.	0.3023E+04	0.1894+05	0.7285+13	0.6565+14
2.	0.3272+04	0.1915+05	0.7803+13	0.4566+14
3.	0.2375+04	0.1350+05	0.5632+13	0.3201+14
Core Total	0.2891+04	0.1721+05	0.2072+14	0.1233+15

Period: October 1, 1976 - December 30, 1976



Power %

Power Flow GPA

0.01 mi
μg/gm

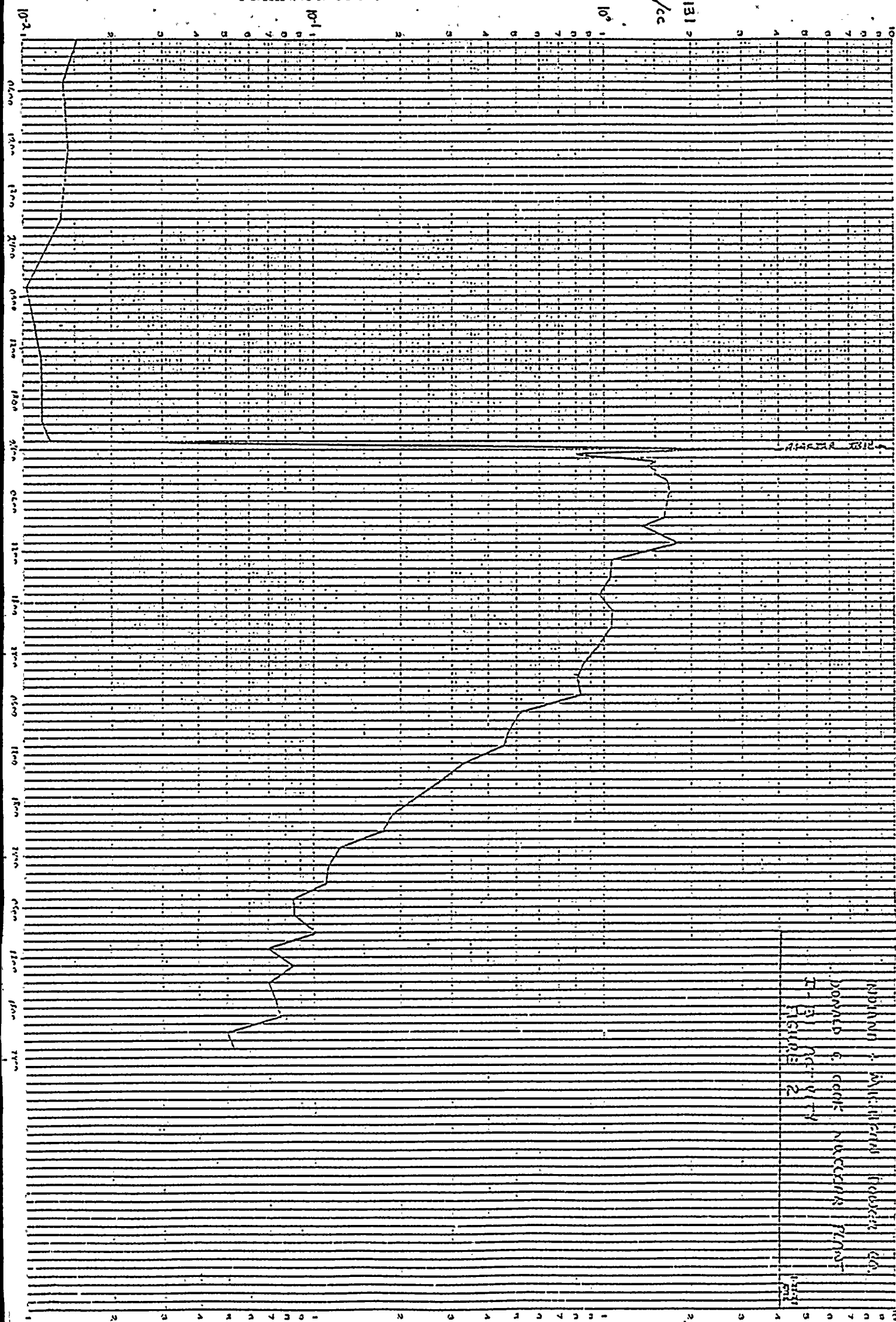
NEAL 3410-15 DICTEON GRAPH PAPER
MADE IN U.S.A.
EUGENE DIEBOLD CO.

WATKINS & WATKINS
DEVELOP. & COOK ACCESSORY
POWER, PURIFICATION, D.E.I-131
FIGURE 3

12-25-76 12-26-76 12-27-76

EUGENE DIETZEN CO.
MADE IN U. S. A.

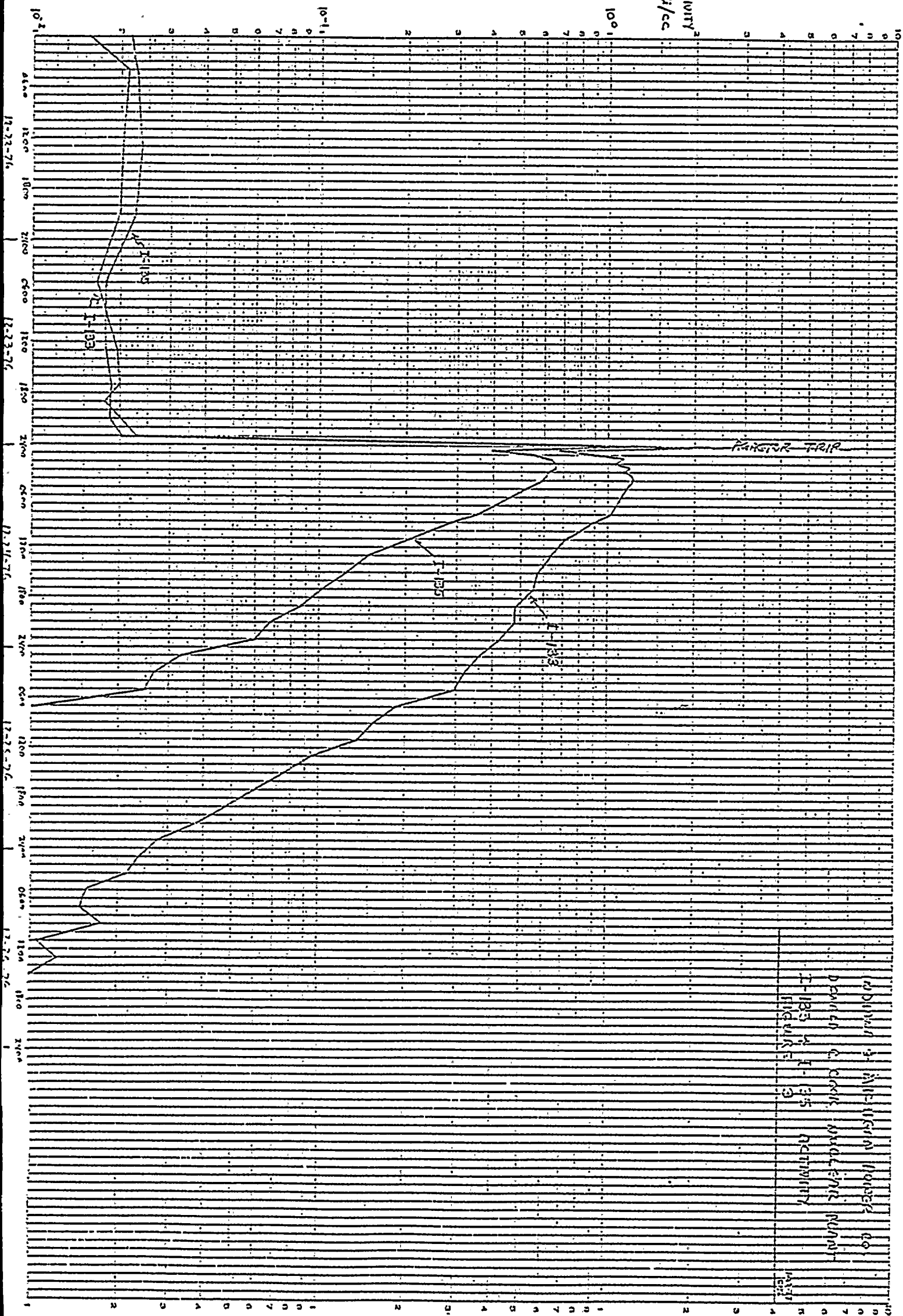
I-131
 Wei/cc



NO. 341D-LS10 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.

ACTIVITY
 $\mu\text{Ci/cc}$



ADDITIONAL INFORMATION
DOWNED & CRASH, MONTANA
I-135 & I-135 ACTIVITY
INDICATED

