

11
1 COMMISSIONER LEWIS: Mr. Floyd, I'd like to go back
2 to before the accident. According to Richard Hartfield,
3 Director of the NRC's Management and Program Analysis Office,
4 Unit 2 has had 50 percent more reportable occurrences than the
5 nationwide average for nuclear reactors. That was before
6 Unit 2 went on line and went commercial. What does that say
7 to you about the readiness of Unit 2 to go into operation?

8 MR. FLOYD: I need to know if he is quoting the
9 national average for nuclear reactors today, or if he is quot-
10 ing the national average for reactors in their first year
11 before commercial operation. It could make a great big
12 difference to how I respond to your question as to which
13 average he is comparing us to.

14 COMMISSIONER LEWIS: He is comparing you to the
15 first year of operation for all nuclear reactors.

16 MR. FLOYD: Okay. This is not quite a fair compari-
17 son because we were in a test program during that year and not
18 in our first year of operation.

19 But assuming it were a fair comparison: The number
20 of reportable occurrences that a station has or a unit has is
21 some kind of an index to what kind of an operation is being
22 run. When you look behind just the number and at the conse-
23 quences of what was wrong, the two occurrences might be much
24 more important than 10 or 20.

25 There are many things which I have to put myself on

CAVENDISH 1978

COUNTS TOTAL

ANO 1	28	FT. ST. VEAN	- 30
ANO 2	- 31	H.B. ROBINSON	- 30
BEAVER VALLEY	1 66	KADDAN NECK	- 33
B.V.	- 2 - 2	HUMBOLDT BAY	4
BIG LICK POINT	- 48	INDIAN POINT	2 - 35
BROWN FERRY	1 - 33		3 - 33
	2 - 21	FERRY	- 1 87
	3 - 32		2 - 1
BRUNSWICK	1 - 94	KESWAUNKE	- 37
	2 78	LACROSSE	- 14
BURN	- 1	LIMBRIGHT	1
CALLAWAY	- 1	MAIN YAWK	- 29
CAL. CLIFFS	1 51	McGUIRE	1
	2 - 51	MIDLAND 1	- 1
COOPER	37	MILLSTAR	1 - 31
CRYSTAL RIVER	- 96		2 - 32
D.C. COOK	1 - 65	MONTECALVO	- 31
	2 - 104	NINE MILE POND	- 41
DAVIS BRASS	1 - 125		2 - 2
DENSDEN	1 - 28	NORTH AVON	1 - 129
	2 - 53		2 - 7
	3 - 48		3 - 1
DYON AVON	- 36	OCAVER	1 - 25
HASLET	1 - 90		2 - 13
	2 - 78		3 - 23
FITEPAMICK	109	OYSTON CRK	- 35
FT. CALLOW	- 46	PAL	- 17

POOR ORIGINAL

Peach Bottom 2 - 50
3 - 23

PILGRIM 1 54

Park View 1 - 20

2 - 11

Prairie Island 1 - 22

2 - 10

Quadrant 1 - 34

2 - 39

Rancho Seco - 22

R. E. Ginna - 10

SAVEN 1 - 80

SAV ORORE 1 - 12

2 - 1

Simsbrook - 1

SILVERDALE - 2

SIPROTON - 5

SOUTHWAS 1

S. Lucia - 48

SUNY 1 - 51

2 - 37

SUSQUEHANA 1 - 2

2 - 1

VMI 1 - 31

2 - 62

Wojan - 26

TURKEY Pt 3 - 15

4 15

- V. Elm. Yarn - 34

Zimmer 1 1

WATERLOO 3 - 1

WATSBY 1 5

WPPSS - 2 - 2

Yarn Plan - 40

Zion - 1 - 99

2 - 42

Grand Total

3115

POOR ORIGINAL

PLANTS WITH O.L. BY END OF 78

ARKANSAS 1	- 28	HUMBOLDT BAY	- 4
" 2	- 31	INDIAN POINT 1	- 0
BEAVER VALLEY 1	- 66	" 2	- 35
BIG ROCK POINT	- 48	" 3	- 33
BROWNS FERRY 1	- 33	KEWAUNEE	- 37
" 2	- 21	LACROSSE	- 14
" 3	- 32	MAINE YANKEE	- 29
BRUNSWICK 1	- 94	MILLSTAR 1	- 31
" 2	- 78	" 2	- 32
CALVERT CLIFFS 1	- 51	NAUTICELLO	- 31
" 2	- 51	NINE MILE Pt 1	- 41
COOK 1	- 65	NORTH ANNA 1	- 129
" 2	- 104	DOONER 1	- 25
COOPER	- 37	" 2	- 13
CRYSTAL RIVER 3	- 96	" 3	- 23
DAVIS BRIDGE 1	- 125	QYSM CRACK	- 35
DUNSDEN 1	- 28	HALISADES	- 47
2	- 53	PRACK BOTTOM 2	- 50
3	- 48	" 3	- 23
DUNN ARNOLD	- 36	PILGRIM 1	- 54
FARLEY 1	- 87	POINT BRACK 1	- 20
FITZPATRICK	- 109	" 2	- 11
FORT CALHAN	- 46	PRAIRIE ISLAND 1	- 22
FORT ST. VRAIN	- 30	" 2	- 10
GUNNA	- 10	QUAD CITIES 1	- 34
HADDAM NECK	- 33	" 2	- 39
HART 1	- 90	RAVENO SECO	- 22
POOR ORIGINAL	- 78	ROBINSON 2	- 30

②

SALE 1	-80
SA ONOM 1	-12
ST LUCIA	-48
SING 1	-51
" 2	-37
TMI 1	-31
" 2	-62
TRAJAN	-26
Tuesday Fair 3	-15
" 4	-15
Various Yards	-34
Yards Row	-40
ZIA 1	-99
" 2	-42

3074 TOTAL.

POOR ORIGINAL

DWR

GT 3058

B+W PLANTS

ANO 1 - 28
 Crystal River 96
 Deers Back - 125
 Ocala 1 - 25
 2 - 13
 3 - 23

Rough Sco - 22

THI 1 - 31
 2 - 62

B+W TOTAL 425

COMBUSTION ENGINEERING

ARKANSAS 2 - 31

CALVERT CLIFFS 1 - 51

2 - 51

FORT CALHOUN - 46

MILLSTONE 2 - 32

335 PALISADES - 47

ST. LUCIE - 48

MAINE Yankee - 29

WESTINGHOUSE

BRAUN VALLEY 66

CONC 1 - 65

2 - 104

FALCON 1 - 87

GINNA - 10

HADDAM Neck 33

INP 2 - 35
 3 - 33

KEWAUNUC - 37

NORTH ANNA 1 - 129

POINT BRANCH 1 - 20

2 - 11

PATRIK ISLAND 1 - 22

2 - 10

ROBINSON 2 - 30

SALMON 1 - 80

SAN ANTONIO - 12

SING 1 - 51

2 - 37

INDIAN - 26

TURKEY Pt 3 - 15

4 - 15

YANKEE ROW - 90

ZION 1 - 99

2 - 42

(W) TOTAL 1109

25

25

10

25

69

POOR ORIGINAL

BWR

BAG ROCK Point 48

BAF 1 - 33

2 - 21

3 - 32

Brunswick 1 - 99

2 - 78

COOPER 37

DRESDEN 1 - 28

2 - 53

3 - 48

Duane Ann. 36

FITZ - 109

HART 1 - 90

2 - 78

HUM. Bay - 4

LACROSS - 14 - AC - 14

MIS 4 - 31

MONTICELLO - 31

NMP 1 - 41

QUEEN CK - 32

RUBS 2 - 50

3 - 23

PILGRIM - 54

QUAD 1 - 34

2 - 39

VEY - 34

25

GEYMAR

1161

+ HITGR

1 -
FST. VMAJ

- 30

GT. 3074

POOR ORIGINAL

69 PLANTS ~~REPORTED~~ ³⁰⁷⁴ EVENTS IN
1978

AUG

B+W 425 / 9 / 47.22

CF 335 / 8 / 41.88

(W) 1109 / 25 / 44.36

(GE) 1161 / 25 / 46.44

AE 14 (1) 14.00

GA 30 (1) 30.00

3074 / 69

37.32

AUG - 44.55

POOR ORIGINAL

PLANS GETTING OL ID 1978 ?

TMI 2 - 2/8/78

NAMN 1 - 1/26/77

HATCH 2 6/13/78

COOK 2 - 12/23/77

AWO-2 - 9/1/78

PLANS GOING CRITICAL IN 78

N.A. 1 d/s/78

TMI 2 3/28/78

HATCH 2 - 7/9/78

COOK 2 3/10/78

AWO 2 12/5/78

POOR ORIGINAL

TMI 2	62
NORTH ANNA 2 -	129
COOK 2	104
ANO 2	(31)
HATCH 2 -	78

POOR ORIGINAL

Question II. How many incidents or events have occurred at TMI-2 before the accident?

Answer

During the period from license issuance (February 8, 1978) through March 30, 1979 a total of 69 licensee events were reported to the Nuclear Regulatory Commission. These included the following causes and types of reports.

<u>CAUSE TITLE*</u>	<u>NUMBER OF REPORTS</u>		
	<u>14 Day**</u>	<u>30 Day**</u>	<u>Total</u>
Component Failure	0	13	13
Defective Procedures	2	8	10
Design/Fabrication Errors	9	13	22
External Cause	0	0	0
Other	1	8	9
Personnel Error	<u>6</u>	<u>9</u>	<u>15</u>
Total	18	51	69

*These causes are defined on pages 13-15 of the enclosed NUREG-0161, Instructions For Preparation of Data Entry Sheets for Licensee Event Report (LER) File.

**The 14 day and 30 day reports are described on pages 1.16-3 through 1.16-5 of Regulatory Guide 1.16 (Revision 4, August 1975). Copy attached.

Question . How does the frequency and type of event compare with other facilities?

Answer

During 1978 there were 1765 licensee events reported to the NRC by the 42 pressurized water reactors that had operating licenses during that period. The TMI-2 reports are included in this table and a copy of the printout of all events reported by TMI-2 is attached.

<u>CAUSE TITLE</u>	<u>NUMBER OF REPORTS</u>		
	<u>14 Day</u>	<u>30 Day</u>	<u>Total</u>
Component Failure	72	847	919
Defective Procedures	25	58	83
Design/Fabrication Error	70	105	175
External Cause	3	18	21
Other	38	212	250
Personnel Error	<u>83</u>	<u>234</u>	<u>317</u>
Total	291	1474	1765

The following table lists the number of reports submitted by TMI-2 during this period.

<u>CAUSE TITLE</u>	<u>NUMBER OF REPORTS</u>		
	<u>14 Day</u>	<u>30 Day</u>	<u>Total</u>
Component Failure	0	13	13
Defective Procedures	2	5	7
Design/Fabrication Error	9	11	20
External Error	0	0	0
Other	1	6	7
Personnel Error	<u>6</u>	<u>7</u>	<u>13</u>
Total	18	42	60

Additional data listed below shows the number of licensee events reported by two unit sites for the first year after initial criticality for the second unit at the site and for the first unit during the same time period.

Plant	Time Period	Component Failure	Defective Procedures	Design/Fabrication Error	External Cause	Other	Personnel Error	Totals
TMI-1	3/28/78 - 3/28/79	9	1	3	0	5	4	22
TMI-2	3/28/78 - 3/28/79	13	5	14	0	10	10	52
Calvert Cliffs-1	12/01/76 - 12/01/77	43	8	4	1	38	14	108
Calvert Cliffs-2	12/01/76 - 12/01/77	67	1	6	1	14	12	101
D. C. Cook-1	03/10/78 - 03/10/79	22	5	8	0	12	17	64
D. C. Cook-2	03/10/78 - 03/10/79	39	5	12	1	21	28	113

The following data provide a breakdown of the licensee events reported by each of the other Babcock & Wilcox (B&W) facilities during the one year period immediately following license issuance. This will provide some correlation between the events experienced at TMI-2 and other B&W facilities for somewhat similar periods of operation.

Facility	Component Failure	Defective Procedure	Design/Fabrication Error	External Cause	Other	Personnel	Total
Other B&W Facilities - One Year Period Immediately Following License Issuance							
Arkansas 1	4	2	3	19	21	2	51
Crystal River	34	7	7	3	35	16	102
Davis Besse	51	14	18	4	21	22	130
Oconee 1	11	7	4	0	1	11	34
Oconee 2	7	6	1	0	2	9	25
Oconee 3	12	2	7	0	0	12	33
Rancho Seco	9	5	4	1	0	11	30
TMI-1	27	18	20	5	5	11	86
B&W Average	19.4	7.6	8.0	6.4	14.1	11.7	61.4

Care should be exercised in comparing these data, since some of these facilities do not have the more complex systems and components utilized in newer facilities. In addition, the significance of individual LERs varies.

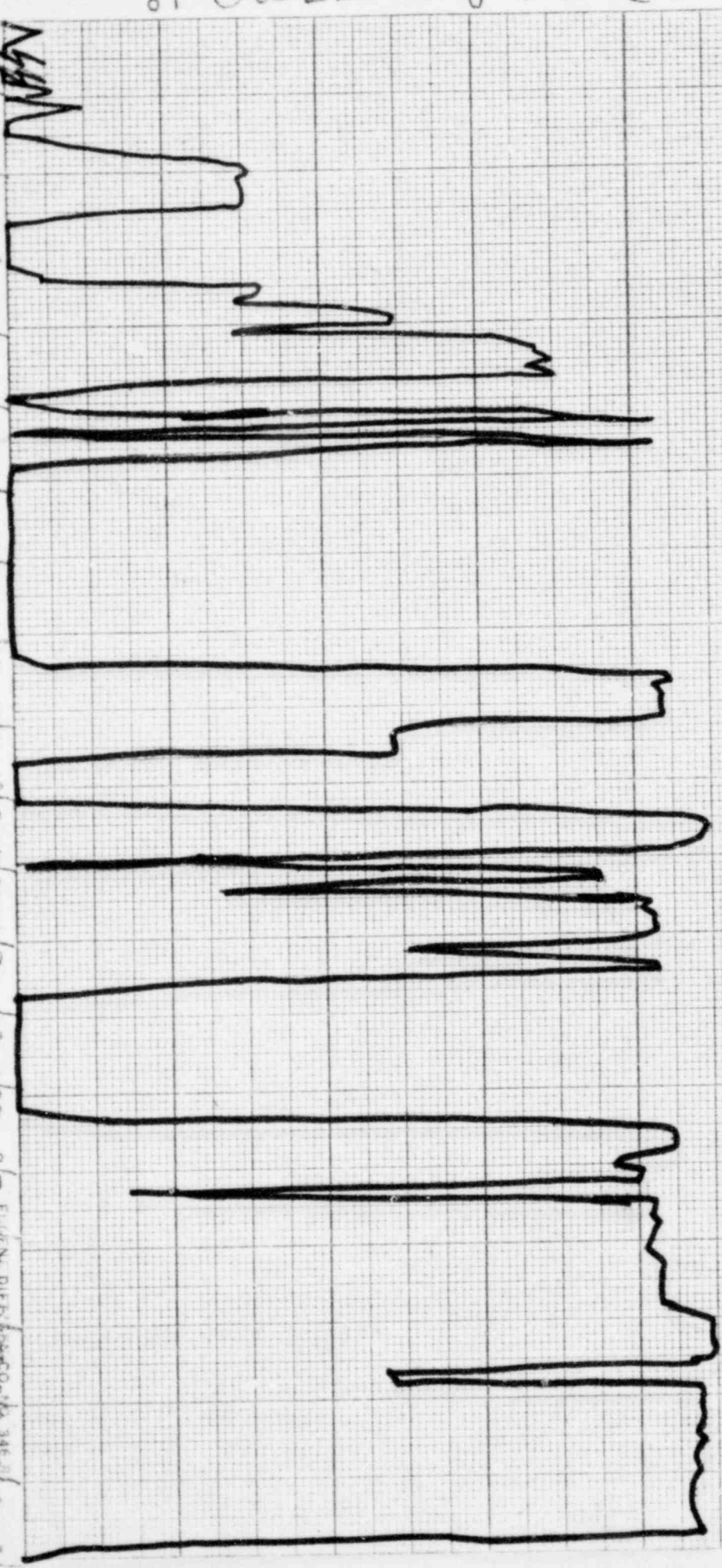
Question . What guidelines does the Commission have to determine when the frequency of incidents constitute a problem?

Answer

Though the Commission has identified the types of incidents licensees are to report, reviews the information reported, and takes action as it deems appropriate, the Commission at the present time does not have specific guidelines to determine when the frequency of a given type of reported incident constitutes a problem. Engineering judgments, applied by knowledgeable people on an ad hoc basis, have been used to initiate actions to reduce the frequency of events causing safety concerns. The recurrent of some events has, for example, led to the identification of generic safety issues. The resolution of these issues has resulted in changes in the licensing and review process, as well as in plant modifications and in technical specification changes, yielding safer operations. This process for reviewing and analyzing licensee event reports is now being reviewed to establish more formal and systematic evaluation procedures. A copy of SECY 79-371 is attached for your information, however, this document has not received Commission approval yet. Improvements should lead to earlier discovery and correction of potential safety problems.

Power in MW(e) 18 ET

4/20 9/20 9/30 10/10 10/20 10/30 11/9 11/19 10/29 12/9 12/19 12/29 1/8 1/18 1/28 2/7 2/17 2/27 3/9 3/19 3/22



POOR ORIGINAL

POOR ORIGINAL

Table 2
 Comparison of Licensee Event Reports
 For TMS-1, ~~Final~~ Occurrence 3

CAUSE TITLE	TMS-1 ²	Occurrence-3 ³
Component Failure	10	50
Defective Procedures	25	14
Design/Fabrication	36	9
External Cause	5	1
Personnel Error	39	24
Other	5	8
<u>Total</u>	<u>180</u>	<u>106</u>

TMS-2⁴

¹ Defined in NUREG-0161
² Period of 6/6/74 to 3/27/79
³ ~~Period of 2/18/78 to 3/17/79~~
⁴ Period of 9/10/74 to 3/27/79

TMI-I

6/6/74 - 3/28/79

Total

			14 day	30 day	HTI	
70	Component Failure	34				36
25	Defective Procedures	20				5
36	Design/Fabrication	23				13
5	External Cause	5				0
39	Personnel Error	24				13
5	Other	3				2
<u>180</u>						

9/10/74 → 3/27/79

~~DB-I~~ Oconce - 3

Total

			14 day	30 day	
50	Component Failure	19			31
14	Defective Procedure	7			7
9	Design/Fabrication	6			3
0	External Cause	0			
24	Personnel Error	14			8
8	Other	1			7
<u>105</u>					

POOR ORIGINAL