

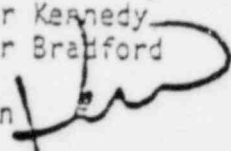


UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 11, 1977

PDR
2. File (mem):
Financial
Analysis

MEMORANDUM FOR: Chairman Hendrie
Commissioner Gilinsky
Commissioner Kennedy
Commissioner Bradford

FROM: Ken Pedersen 

SUBJECT: RELATION BETWEEN NUMBER OF LICENSEE EVENT REPORTS AND
BOND RATINGS

At your request, OPE has made a quick, limited study of the relation between the number of LER's coming from a particular nuclear power plant and the bond rating of its owner. The purpose of the study was to see if there is any correlation between LER's and bond ratings that might suggest possible connections between safety and financial strength.

Our primary analysis was for 1976. Additional analyses addressed the five-year period of 1972-76. In both cases we included only those plants that had received operating licenses at least a year before the beginning of the period studied (to avoid the likely masking effects of startup and shakedown). The plant-by-plant data underlying the analyses are shown at the end of this report (Tables 6 and 7). An appendix defines the bond ratings.

For perspective, we looked up the bond ratings of all companies which currently hold OL's or CP's. Table 1 shows the statistics on the current Moody bond ratings, which range from Aaa to Baa.

Findings

1. Our most important finding is that numbers of LER's per plant are scattered so widely within each bond grade, and overlap so greatly from grade to grade, as to suggest the absence of any correlation that would not be highly speculative. Figure 1 (immediately after Table 1) shows the scatter of points for 1976.

CONTACT:
George Sege (OPE)
634-1643

2. Analyses of averages for 1976 and for the five-year period, shown on Tables 2, 3, and 4, must be interpreted with the extreme caution called for by Finding 1. Overall, the averages show increasing numbers of LER's as one descends in bond rating from Aa, through A, to Baa. But the trend is weak, and plants owned by the one company with an Aaa bond rating (Commonwealth Edison) averaged more LER's in 1976 than A-rated companies, and more in the five-year analysis than Baa-rated companies. The LER performance of plants whose owners are not investor-owned utility companies was close to that of Aa-rated companies' plants.
3. There was a general increase in the number of LER's per plant over the five-year period studied (as evident from Table 6). Reporting requirements and practices had become substantially more stringent during that period. I do not believe that we can read any significance into the coincidence that the 1972-76 period also happened to be a period of eroding financial condition for electric utilities, as evidenced, for example, by the fact that six of the fourteen nuclear plant owners studied had their bond ratings reduced during the period (Table 6). This belief is corroborated by Finding 4.
4. For a particular company the number of LER's does not appear to correlate at all with changes in the rating of its bonds. Table 5 lists the six companies that had bond ratings reduced and shows their relative LER performance before and after the reduction. Two of the companies dropped in LER performance after they had their bonds derated, two improved, and two remained unchanged. The changes that did take place were well within year-to-year variation ranges for companies in periods of stable bond rating. (There were no raised bond ratings for any of the companies involved during the period studied.)

cc: Jerome Nelson
Sam Chilk

Attachments:
As stated

Table 1

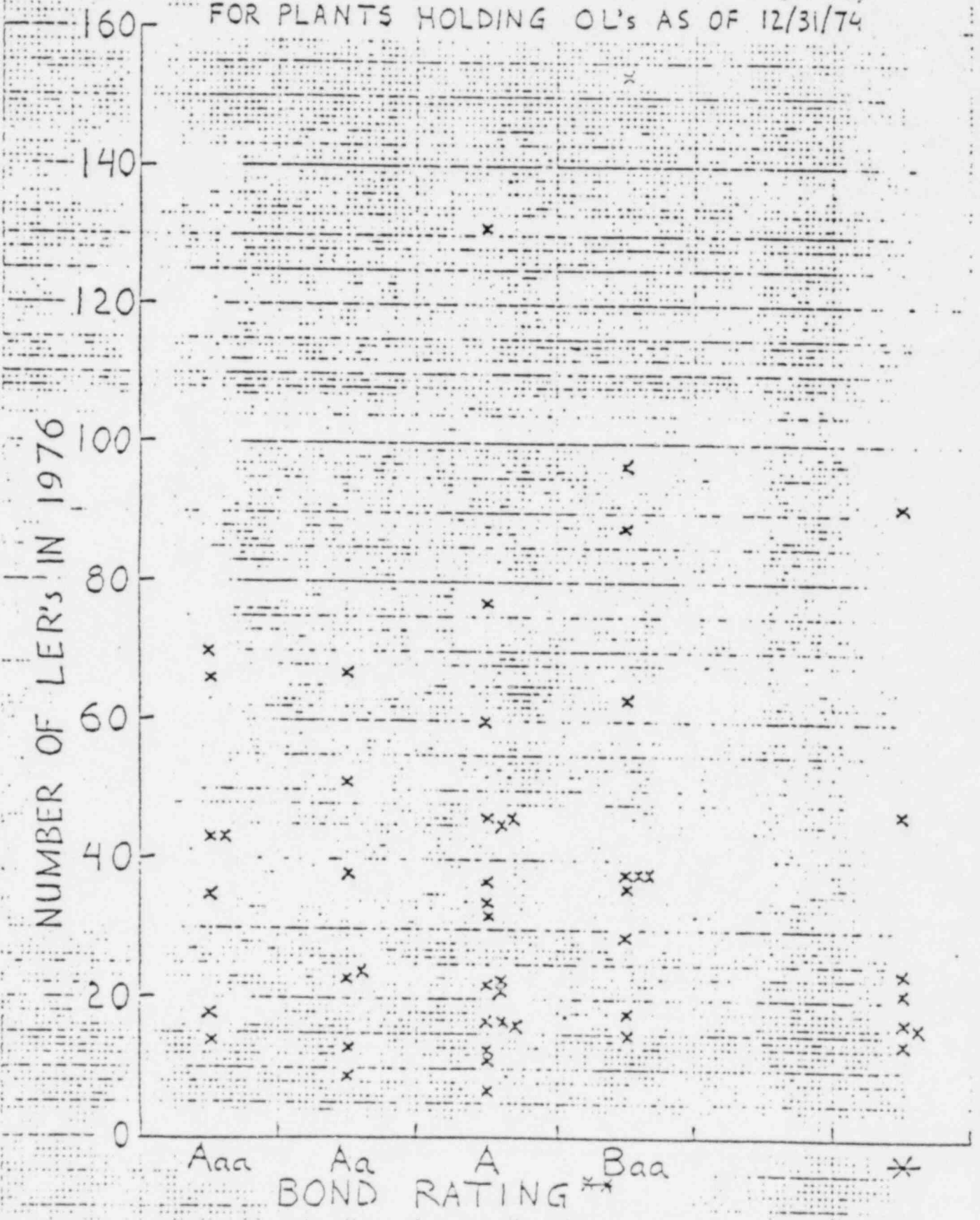
BOND RATINGS OF CURRENT HOLDERS OF OPERATING LICENSES OR
CONSTRUCTION PERMITS

<u>Bond Rating</u> (Moody, Sept. 1977)	<u>No. of</u> <u>Companies</u>	<u>No. of</u> <u>Plants</u>
Aaa	2	15
Aa	17	33
A	17	43
Baa	15	30
*	5	20

* Owner not an investor-owned utility company

FIGURE 1

LER's vs, BOND RATING (1976)
FOR PLANTS HOLDING OL's AS OF 12/31/74



Legend: *) Other than investor-owned
 ***) Moody 7/76

Table 2

NUMBER OF LICENSEE EVENT REPORTS VS. BOND RATING: 1976

<u>Bond Rating</u> (Moody, 7/76)	<u>No. of</u> <u>Companies</u>	<u>No. of</u> <u>Plants**</u>	<u>LER's per Plant</u> (1976 Average)	<u>Rank+</u>
Aaa	1	7	40	4
Aa	5	7	32	1
A	12	18	36	3
Baa	9	11	56	5
*	5	7	33	2

* Plants owned by entities other than investor-owned utility companies.

** Plants covered are those holding operating licenses as of December 31, 1974.

+ Lowest rank number means fewest LER's.

Table 3

NUMBER OF LICENSEE EVENT REPORTS VS. BOND RATING: 1972-76 (PRE-1971 PLANTS)

<u>Year</u>	<u>Bond Rating (Moody, July)</u>	<u>No. of Companies</u>	<u>No. of Plants **</u>	<u>LER's per Plant (Year Average)</u>	<u>Rank +</u>
1972	Aaa	1	2	12	1
	Aa	4	4	13	2
	A	8	8	13	2
	Baa	0	0	-	
	*	1	1	14	4
1973	Aaa	1	2	32	4
	Aa	4	4	13	3
	A	7	7	12	2
	Baa	1	1	49	5
	*	1	1	6	1
1974	Aaa	1	2	45	5
	Aa	4	4	18	2
	A	5	5	29	4
	Baa	3	3	28	3
	*	1	1	9	1
1975	Aaa	1	2	31	5
	Aa	2	2	10	2
	A	5	5	24	3
	Baa	5	5	24	3
	*	1	1	9	1

1976	Aaa	1	2	44	5
	Aa	2	2	11	1
	A	5	5	34	4
	Baa	5	5	20	3
	*	1	1	17	2

-
- * Owner not an investor-owned utility company
 - ** Plants covered are those holding operating licenses as of December 31, 1970.
 - + Lowest rank number means fewest LER's.
 - ++ Includes two companies with suspended ratings.
Both were rated A before the suspension and Baa after it.

Table 4

RANK IN NUMBER OF LER'S VS. BOND RATING
 (Lowest rank number means fewest LER's)

	<u>1976 Rank **</u>	<u>5-Year Average Rank ***</u>
Aaa	4	4.0
Aa	1	2.0
A	3	3.0
Baa	5	3.5
*	2	1.6

* Plants owned by entities other than investor-owned utility companies

** Based on plants holding operating licenses as of December 31, 1974.

*** 1972-76, based on plants holding operating licenses as of December 31, 1970.

Table 5

EFFECT OF REDUCTION OF BOND RATING ON RELATIVE NUMBER OF
LICENSEE EVENT REPORTS

<u>Company</u>	<u>Year of Reduced Bond Rating</u>	<u>No. of Grades Reduced</u>	<u>Rank +</u>		
			<u>Before Bond Rating Reduction</u>	<u>After Bond Rating Reduction</u>	<u>Improved (+) Worsened (-), or No change (0)</u>
Carolina P&L	1975	1	6, 12, 13 (10)	8, 7 (8)	+
Con. Ed.	1974	1*	12, 2 (7)	9, 1, 1 (4)	+
Consumers	1975	2	7, 9, 11 (9)	12, 12 (12)	-
Jersey Central	1973	1	14 (14)	15, 15, 14, 10 (14)	0
Northeast Nuc.	1975	1	15, 10, 7 (11)	11, 14 (13)	-
Yankee Atomic	1974	1*	9, 1 (5)	2, 8, 5 (5)	0

* Suspended rating, counted as reduction to rating accorded the following year.

+ Reflects standing among 15 plants in successive years before and after reduction of bond rating. Average rank in parentheses. Pluses and minuses are based on average. Lowest rank number means fewest LER's.

TABLE 6

BOND RATINGS AND LICENSEE EVENTS REPORTS FOR 1976

(Plants holding OL's as of 12/31/74)

<u>COMPANY</u>	<u>Bond Rating (Moody, 7/76)</u>	<u>REACTOR TYPE</u>	<u>PLANT</u>	<u>LER's for 1976</u>
ARKANSAS POWER & LIGHT CO.	Baa	PWR	ARKANSAS 1	36
BOSTON EDISON CO.	Baa	BWR	PILGRIM 1	38
CAROLINA POWER & LIGHT CO.	Baa	PWR	ROBINSON 2	18
		BWR	BRUNSWICK 2	153
COMMONWEALTH EDISON CO.	Aaa	BWR	DRESDEN 1	18
		BWR	DRESDEN 2	70
		BWR	DRESDEN 3	35
		BWR	QUAD CITIES 1	43
		BWR	QUAD CITIES 2	14
		PWR	ZION 1	66
		PWR	ZION 2	43
CONNECTICUT YANKEE ATOMIC POWER CO.	A	PWR	HADDAM NECK	22
CONSUMERS POWER CO.	Baa	BWR	BIG ROCK POINT	38
		PWR	PALISADES	38
DAIRYLAND COOPERATIVE POWER	*	BWR	LACROSSE	17
DUKE POWER COMPANY	A	PWR	OCONEE 1	37
		PWR	OCONEE 2	17
		PWR	OCONEE 3	21
FLORIDA POWER AND LIGHT CO.	A	PWR	TURKEY POINT 3	11
		PWR	TURKEY POINT 4	7
GEORGIA POWER COMPANY	Baa	BWR	HATCH 1	88

BOND RATINGS AND LICENSEE EVENT REPORTS FOR 1976

(Plants holding OL's as of 12/31/76)

<u>COMPANY</u>	<u>Bond Rating (Moody, 7/76)</u>	<u>REACTOR TYPE</u>	<u>PLANT</u>	<u>LER's for 1976</u>
INDIANA AND MICHIGAN ELECTRIC COMPANY	Baa	PWR	COOK 1	63
IOWA ELECTRIC LIGHT AND POWER CO.	Baa	BWR	ARNOLD	97
JERSEY CENTRAL POWER AND LIGHT CO.	Baa	BWR	OYSTER CREEK 1	29
MAINE YANKEE ATOMIC POWER COMPANY	A	PWR	MAINE YANKEE	17
METROPOLITAN EDISON COMPANY	A	PWR	THREE MILE ISLAND 1	46
NIAGARA MOHAWK POWER CORP.	A	BWR	NINE MILE POINT 1	45
NORTHEAST NUCLEAR ENERGY COMPANY (CONN. LIGHT AND POWER CO. principal owner)	A	BWR	MILLSTONE 1	60
NORTHERN STATES POWER COMPANY	Aa	BWR	MONTICELLO	23
		PWR	PRAIRIE ISLAND 1	67
		PWR	PRAIRIE ISLAND 2	24
OMAHA PUBLIC POWER DISTRICT	*	PWR	FT. CALHOUN	47
PACIFIC GAS AND ELECTRIC CO.	Aa	BWR	HUMBOLDT BAY	9
PHILADELPHIA ELECTRIC COMPANY	A	BWR	PEACH BOTTOM 2	131
		BWR	PEACH BOTTOM 3	77
POWER AUTHORITY OF THE STATE OF N.Y.	*	BWR	FITZPATRICK	91
PUBLIC SERVICE COMPANY OF COLORADO	Aa	HTGR	FT. ST. VRAIN	51

BOND RATINGS AND LICENSEE EVENTS REPORTS FOR 1976

(Plants holding OL's as of 12/31/74)

<u>COMPANY</u>	<u>Bond Rating (Moody, 7/76)</u>	<u>REACTOR TYPE</u>	<u>PLANT</u>	<u>LER's for 1976</u>
ROCHESTER GAS AND ELECTRIC CORP.	A	PWR	R.E. GINNA	32
SACRAMENTO MUNICIPAL UTILITIES DISTRICT	*	PWR	RANCHO SECO	21
SOUTHERN CALIFORNIA EDISON	Aa	PWR	SAN ONOFRE 1	13
TENNESSEE VALLEY AUTHORITY	*	BWR	BROWNS FERRY 1	24
		BWR	BROWNS FERRY 2	14
		BWR	BROWNS FERRY 3	16
VERMONT YANKEE NUCLEAR POWER CORP.	A	BWR	VERMONT YANKEE	46
VIRGINIA ELECTRIC AND POWER COMPANY	A	PWR	SURRY 1	34
		PWR	SURRY 2	23
WISCONSIN-MICHIGAN POWER COMPANY	A	PWR	POINT BEACH 1	13
		PWR	POINT BEACH 2	16
WISCONSIN PUBLIC SERVICE COMPANY	Aa	PWR	KEWANEE	38
YANKEE ATOMIC POWER COMPANY (Central Vermont Public Service co. principal owner)	Baa	PWR	YANKEE ROWE	15

* Not an investor-owned utility company.

Table 7

BOND RATINGS AND LICENSEE EVENTS REPORTS -- 1972-1976

(Plants holding OL's as of 12/31/70)

COMPANY	1972	Bond Rating (Moody, July)				REACTOR TYPE	PLANT	1972	No. of LER's				
		73	74	75	76				73	74	75	76	
CARLINA POWER AND LIGHT CO.	A	A	A	Baa	Baa	PWR	ROBINSON 2	9	20	50	19	18	
COMMONWEALTH EDISON COMPANY	Aaa	Aaa	Aaa	Aaa	Aaa	BWR	DRESDEN 1	2	21	26	17	18	
						BWR	DRESDEN 2	21	42	63	45	70	
CONSOLIDATED EDISON COMPANY	A	A	(S)	Baa	Baa	PWR	INDIAN POINT 1	20	6	27	2	1	
CONNECTICUT YANKEE ATOMIC POWER COMPANY	A	A	A	A	A	PWR	HADDAM NECK	6	13	15	7	22	
CONSUMERS POWER COMPANY	Aa	Aa	Aa	Baa	Baa	BWR	BIG ROCK POINT	10	19	36	39	38	
DAIRYLAND COOPERATIVE POWER	*	*	*	*	*	BWR	LACROSSE	14	6	9	9	17	
JERSEY CENTRAL POWER AND LIGHT COMPANY	A	Baa	Baa	Baa	Baa	BWR	OYSTER CREEK 1	30	49	68	42	29	
NIAGARA MOHAWK POWER CORP.	A	A	A	A	A	BWR	NINE MILE POINT 1	12	17	18	41	45	
NORTHEAST NUCLEAR ENERGY CO.	Aa	Aa	Aa	A	A	BWR	MILLSTONE 1	31	18	20	29	60	
PACIFIC GAS AND ELECTRIC CO.	Aa	Aa	Aa	Aa	Aa	BWR	HUMBOLDT BAY	7	8	14	8	9	
ROCHESTER GAS AND ELECTRIC CO.	A	A	A	A	A	PWR	R.E. GIHNA	13	14	25	25	32	
SOUTHERN CALIFORNIA EDISON CO.	Aa	Aa	Aa	Aa	Aa	PWR	SAN ONOFRE 1	5	8	2	11	13	

BOND RATINGS AND LICENSEE EVENTS REPORTS -- 1972-1976

(Plants holding OL's as of 12/31/70)

<u>COMPANY</u>	<u>1972</u>	<u>Bond Rating</u> (Moody, July)				<u>REACTOR TYPE</u>	<u>PLANT</u>	<u>1972</u>	<u>No. of LER's</u>			
		<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>				<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>
WISCONSIN-MICHIGAN POWER CO.	A	A	A	A	A	PWR	POINT BEACH 1	7	12	37	17	13
YANKEE ATOMIC POWER CO.	A	A	(S)	Baa	Baa	PWR	YANKEE ROWE	13	4	7	19	15

* Owner not an investor-owned utility company

(s) Rating suspended

Baa

Bonds which are rated Baa are considered as medium grade obligations, i.e. they are neither highly protected nor poorly secured. Interest payments and principal security appear adequate for the present but certain protective elements may be lacking or may be characteristically unreliable over any great length of time. Such bonds lack outstanding investment characteristics and in fact have speculative characteristics as well.

Ba

Bonds which are rated Ba are judged to have speculative elements; their future cannot be considered as well assured. Often the protection of interest and principal payments may be very moderate and thereby not well safeguarded during both good and bad times over the future. Uncertainty of position characterizes bonds in this class.

B

Bonds which are rated B generally lack characteristics of the desirable investment. Assurance of interest and principal payments or of maintenance of other terms of the contract over any long period of time may be small.

Caa

Bonds which are rated Caa are of poor standing. Such issues may be in default or there may be present elements of danger with respect to principal or interest.

Ca

Bonds which are rated Ca represent obligations which are speculative in a high degree. Such issues are often in default or have other marked shortcomings.

C

Bonds which are rated C are the lowest rated class of bonds and issues so rated can be regarded as having extremely poor prospects of ever attaining any real investment standing.