REPORT ON EQUIPMENT AVAILABILITY FOR THE TEN-YEAR PERIOD • 1966-1975

MASTER

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A Report of the
EQUIPMENT AVAILABILITY TASK FORCE
of the PRIME MOVERS COMMITTEE
EDISON ELECTRIC INSTITUTE
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FOR THE
TEN-YEAR PERIOD, 1966-1975

A REPORT OF THE
EQUIPMENT AVAILABILITY TASK FORCE
OF THE
PRIME MOVERS COMMITTEE
EDISON ELECTRIC INSTITUTE

TASK FORCE MEMBERS 1976-1977

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REPORT ON EQUIPMENT AVAILABILITY
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TEN-YEAR PERIOD, 1966-1975

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FOREWORD

This is an annual report of availability and outage statistics for electric power generating facilities operating in the United States of America. A list of utility organizations voluntarily participating in the EEI Equipment Availability Program in 1975 is located in Appendix F. All summary reports in this publication are for the 10-year period 1966-1975.

These statistics are derived from reports of individual units, as submitted by the reporting companies. The input data are subjected to some validation checks prior to being entered in the data base. However, the primary responsibility for data accuracy lies with the reporting organization.

Each reporting utility company has received reports on individual units for which data ^{were} ~~was~~ submitted. Also, selected major equipment manufacturers receive copies of computer reports showing an analysis of the data for ^{their} ~~his~~ equipment.

Revised reporting instructions to incorporate Safety and Environmental Requirement Cause Codes were issued effective January 1, 1976. In addition, provisions have been made for identifying major equipment manufactured outside of the United States or under foreign license. Future reports will reflect information in these areas.

The Equipment Availability Task Force expresses appreciation to the large group of utilities and their personnel who prepare the input data for this program. It is hoped this Report will reach them and return real benefit for their efforts.

The Equipment Availability Task Force also expresses appreciation to Mr J P Whooley of Public Service Electric and Gas Company, Mr J L Weiser of the Edison Electric Institute and Maria Schafranek for their technical assistance and supervision in the computer processing of annual and special reports.

I. REQUEST FOR SPECIAL ANALYSIS

Recognizing that an Annual Report contains only a limited amount of general outage data in selected categories, the Task Force has agreed to perform special analyses of the data bank if the cost of computer services is met by the requestor and if the required analysis conforms to the following policy guidelines:

1. Data of specific generating units or specific utility companies will not be disseminated without the written consent (obtained by requestor) of a designated representative of the company involved.
2. A contributing company may request an analysis of the data bank on any basis which does not reveal the data of specific generating units, specific companies other than their own or groups of companies. A contributor may also request data on equipment of specific manufacturers.
3. A member of a power pool or interconnection organization may request data on the same basis as described in Paragraph 2 or may request data from specific units or companies within the pool organization provided that the request is accomplished by written consent from the pool members whose data are being included in the request.
4. Manufacturers may request analyses of the data bank on any basis which does not reveal the data of specific units, utility companies, groups of companies or manufacturers, and may request data on their own equipment, on any basis which does not reveal the data of

specific units, specific companies or groups of companies.

Manufacturers may make requests for data on specific units of their own manufacture provided that the request is accompanied by written consent from the utility companies involved.

5. Architect/engineers and consultants may request composite or component summarized data on plants which they have designed. A list of these plants must be submitted to EEI containing company and unit names. If unit-by-unit reports are requested, written consent (obtained by requestor) of designated representatives of companies involved must accompany the request.
6. Requests which do not fit the policy guidelines as approved by the EEI Prime Movers Committee should be referred to the Chairman of the Equipment Availability Task Force. Request for special analyses should be sent to EEI headquarters in New York.

II. SUPPLEMENTAL REPORTS AND ANALYSIS

Due to the large number of special requests received by the Task Force, included in this Report with the standard fossil size breakdowns (60-89 MW, 90-120 MW, 130-389 MW, 390-599 MW and 600 MW and above) are new size breakdowns (100-199 MW, 200-299 MW, 300-399 MW, 400-599 MW, 600-799 MW and 800 MW and above. These new size breakdowns will be used in future reports unless the Task Force received requests to the contrary.

In addition to the annual report, the EEI Equipment Availability Task Force prepares supplemental reports. In October, 1976, the Task Force published the report entitled "EEI Equipment Availability Summary Report on Trends of Large Mature Fossil Units Categorized by Fuel and in Commercial Operation Prior to January 1, 1971."

The Task Force also publishes quarterly reports for fossil units 600 MW and above. A copy of the latest report is included in this report in Figure 10 on Page 42.

The Task Force is also making special studies for working groups of the EEI Prime Movers Committee who are investigating basic causes of power generating problems.

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
1975 SUMMARY REPORT FOR ALL SYSTEMS
TOTAL NUMBER OF UNIT YEARS IS 13603

PAGE 1 OF 1
FIGURE 1

ALL UNITS 1966-1975

UNIT YEAR AVERAGES

DESIGNATION OF UNITS	NO OF UNITS	UNIT YEARS	SERVICE HOURS	AVAILABLE HOURS	SERVICE FACTOR %	FORCED OUT RATE % *	EQUIV FOR OUT RATE %	CAPACITY FACTOR %	OUTPUT FACTOR %	EQUIV AVAIL %
FOSSIL	998	6933	6963.67	7399.56	80.44	5.58	7.63	63.64	80.66	83.30
NUCLEAR	49	168	5916.05	6046.67	72.76	12.62	17.27	59.49	86.33	69.24
GAS TURBINE	607	2812	1126.14	7098.60	13.71	35.22	35.87	11.35	77.49	86.29
JET ENGINE	352	1394	962.12	7115.02	11.58	43.01	49.79	9.13	68.99	83.92
DIESEL	224	1186	835.39	8092.29	9.80	28.33	31.44	6.36	80.43	94.54
HYDRO	170	932	6101.62	8356.21	69.71	1.59	1.68	38.12	58.57	95.40
PUMPED STORAGE	31	161	2288.33	7308.99	27.23	11.69	11.75	15.56	62.09	86.98
MISCELLANEOUS	4	17	6538.04	7045.67	74.61	7.13	8.42	56.45	83.38	76.87
TOTAL	2415	13603								

UNIT YEAR AVERAGES

DESIGNATION OF UNITS	REL MECH AVAIL UNIT YRS	** REL MECH AVAIL %	OPERATING AVAILABILITY %	SCHEDULED OUTAGE RATE % ***	FORCED OUTAGE RATIO %	FORCED OUTAGE INCIDENT RATE %	MEAN TIME BETWEEN FULL FORCED OUTAGES	STARTS NO. TRIED	NO. SUCC	NO. YRS
FOSSIL	3461	86.23	85.47	9.76	32.76	63.09	1115.38	45.1	27.1	637
NUCLEAR	33	83.99	74.37	15.10	41.03	65.11	833.84	21.1	15.6	53
GAS TURBINE	686	97.62	86.46	6.06	55.13	56.23	761.04	193.7	159.6	2236
JET ENGINE	363	96.11	85.68	5.56	61.11	48.08	723.02	201.8	172.0	1130
DIESEL	176	99.60	95.02	1.09	77.94	62.70	1034.51	261.6	237.1	556
HYDRO	479	99.09	95.47	3.39	25.04	26.21	3274.61	446.2	186.0	39
PUMPED STORAGE	36	98.04	87.00	9.39	27.74	35.13	1028.55	629.7	620.5	85
MISCELLANEOUS	5	82.72	80.40	13.66	29.26	60.91	1392.22	21.0	14.6	3
TOTAL	5239									

UNIT YEAR AVERAGES

DESIGNATION OF UNITS	FORCED OUTAGES				MAINTENANCE OUTAGE				PLANNED OUTAGES			
	NO OF OCC	OUTAGE HOURS	** MANHOURS	HOURS WAIT	NO OF OCC	OUTAGE HOURS	** MANHOURS	HOURS WAIT	NO OF OCC	OUTAGE HOURS	** MANHOURS	HOURS WAIT
FOSSIL	7.76	411.93	2241.97	13.00	3.31	244.95	1978.85	4.66	1.22	660.21	7281.84	5.92
NUCLEAR	9.74	854.93	372.69	5.63	2.74	341.63	2732.24	0.75	2.47	886.76	5367.27	8.52
GAS TURBINE	10.78	612.46	552.11	7.07	6.60	257.90	462.45	3.00	1.79	240.38	303.93	3.31
JET ENGINE	11.48	726.34	969.34	19.56	10.59	251.21	684.49	1.66	1.80	210.84	419.12	3.95
DIESEL	8.23	330.30	37.05	2.80	3.36	58.53	47.12	0.71	1.53	34.69	10.07	0.02
HYDRO	2.67	99.16	80.32	0.27	3.70	68.82	122.55	0.07	3.81	228.01	559.87	0.91
PUMPED STORAGE	8.16	302.94	146.58	0.00	13.67	281.58	475.50	0.00	1.39	567.37	1088.77	0.00
MISCELLANEOUS	6.23	502.54	3646.20	0.64	2.05	375.13	4452.00	5.28	1.94	839.46	6662.80	4.23
TOTAL	8.48	461.35	1661.17	10.42	4.88	221.74	1452.77	3.25	1.62	413.87	4978.78	4.28

* NOT RECOMMENDED AS A MEASURE OF OUTAGE RISK FOR UNITS WITH LOW ANNUAL SERVICE HOURS
** THESE NUMBERS ARE AVERAGED USING THE REL MECH AVAIL UNIT YEARS SHOWN ABOVE
*** COMBINATION OF PLANNED AND MAINTENANCE OUTAGES

Comparison of Fossil Units 400 MW and Above to All Nuclear Units

UNIT YEAR AVERAGES
1966-1975

—— FOSSIL
----- NUCLEAR

SAMPLE TABLE

Year of Operation	Fossil-390mw and Above No. of Units	Nuclear No. of Units
1966	17	5
1967	27	6
1968	48	7
1969	69	7
1970	84	9
1971	101	11
1972	124	11
1973	147	22
1974	173	42
1975	191	48

Figure 2

—— FOSSIL
----- NUCLEAR

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 60-89 MW

PAGE 1 OF 2
FIGURE 3a

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	48	NO OF UNITS	95	NO OF UNIT YEARS	458	NO OF RMA UNIT YEARS	154
UNIT STATISTICS		CUMULATIVE		CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
					CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS		3227195.43		BOILER	1.4	93.1	Data No	3342.52	
SERVICE FACTOR-%		80.79		TURBINE	0.6	95.7	Longer	25280.50	
AVAILABLE HOURS		3628370.70		COND.	0.0	98.2	Collected	49929.00	
CAPACITY FACTOR-%		64.27		GEN.	0.1	97.8		46445.58	
OUTPUT FACTOR-%		78.99		OTHER	0.3	98.6		24656.29	
EQUIV F.O.R.-%		3.12		UNIT	2.5	90.8		2384.66	
SCHEDULED OUT RATE-%		7.02							
FORCED OUT. RATIO-%		23.28							
F.O. INCIDENT RATE-%		48.87							
EQUIV AVAILABILITY-%		90.10							

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	3	102.36	330	9	1194	46878.6	50842	4023
TURBINE	0	44.28	37	0	157	20278.3	5687	198
COND.	0	1.97	9	0	79	903.7	1353	16
GEN.	0	11.99	558	0	85	5492.6	85943	2
OTHER	0	25.57	34	0	161	11710.3	5159	36
UNIT	4	186.07	967	9	1674	85219.6	148984	4275

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	2	127.23	543	2	723	58273.5	83593	1081
TURBINE	1	58.53	140	1	299	26805.2	21540	271
COND.	1	34.12	88	0	284	15629.2	13495	113
GEN.	1	34.64	191	0	253	15866.6	29419	189
OTHER	0	24.53	50	0	197	11233.8	7682	42
UNIT	3	177.99	1011	4	1348	81518.7	155729	1696

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	365.31	2501	3	316	167310.7	385190	1214
TURBINE	0	267.85	1272	2	195	122674.9	195929	750
COND.	0	114.71	188	1	91	52535.8	29005	487
GEN.	0	138.71	309	1	103	63528.2	47546	449
OTHER	0	70.42	119	1	65	32250.3	18253	398
UNIT	1	434.96	4389	7	403	199210.8	675923	3298

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	27.11	22	0	241	12416.4	3352	8
TURBINE	0	18.25	13	0	5	8356.4	2032	0
COND.	0	11.29	6	0	39	5171.5	920	0
GEN.	0	2.98	1	0	15	1364.4	98	0
OTHER	0	100.99	6	0	213	46253.5	966	7

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 60-89 MW

PAGE 2 OF 2
FIGURE 3a (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 48 NO OF UNITS 95 NO OF UNIT YEARS 458 NO OF RMA UNIT YEARS 154

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE					
	FORCED			SCHEDULED			FORCED			SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR PER OUTAGE	PERCENT PERIOD	NO OCC	DUR PER OUTAGE	PERCENT PERIOD
FULL OUTAGE	4	186.07	2.13	4	612.95	7.02	1674	50.90	2.13	1751	160.32	7.02
00.1 - 19.9	0	1.22	0.01	0	0.60	0.00	40	13.93	0.01	14	19.70	0.00
20.0 - 29.9	0	1.28	0.01	0	0.84	0.00	58	10.11	0.01	34	11.26	0.00
30.0 - 39.9	0	2.25	0.02	0	1.10	0.01	151	6.81	0.02	38	13.28	0.01
40.0 - 49.9	1	7.61	0.08	0	6.18	0.07	284	12.26	0.08	171	16.54	0.07
50.0 - 59.9	1	14.88	0.17	1	10.95	0.12	445	15.31	0.17	288	17.41	0.12
60.0 - 69.9	0	9.20	0.10	1	17.11	0.19	179	23.53	0.10	309	25.35	0.19
70.0 - 79.9	1	32.88	0.37	0	5.53	0.06	271	55.56	0.37	158	16.04	0.06
80.0 - 89.9	1	58.32	0.66	0	12.82	0.14	258	103.53	0.66	124	47.34	0.14
90.0 - 99.9	1	116.83	1.33	0	3.64	0.04	549	97.46	1.33	60	27.79	0.04
ECONOMY OUTAGE **	875.93 HOURS			10.04 % OF YEAR			401175.27 HOURS			10.04 % OF PERIOD		
FULL OPERATION	6743.04 HOURS			77.31 % OF YEAR			3088314.79 HOURS			77.31 % OF PERIOD		

UNIT STARTS NO. OF YEARS 22

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	35.04	32.90	771	724

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 2862
TOTAL ECONOMY OUTAGE HOURS REPORTED 205474.51

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 90-129 MW

PAGE 1 OF 2
FIGURE 3b

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	78	NO OF UNITS	209	NO OF UNIT YEARS	1397	NO OF RMA UNIT YEARS	573
UNIT STATISTICS				CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
		CUMULATIVE			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS		9544806.34		BOILER	2.7	90.6	Data No		1939.55
SERVICE FACTOR-%		78.22		TURBINE	0.9	93.7	Longer		13497.53
AVAILABLE HOURS		10677826.21		COND.	0.0	96.9	Collected		34274.62
CAPACITY FACTOR-%		59.90		GEN.	0.3	96.0			38370.33
OUTPUT FACTOR-%		76.63		OTHER	0.1	97.9			19155.05
EQUIV F.O.R.-%		5.14		UNIT	4.0	87.5			1438.88
SCHEDULED OUT RATE-%		9.16							
FORCED OUT RATIO-%		26.63							
F.O. INCIDENT RATE-%		58.08							
EQUIV AVAILABILITY-%		86.30							

FORCED OUTAGES									MAINTENANCE OUTAGE							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	5	191.29	1016	13	6290	267235.2	582118	18307	2	149.95	857	4	2657	209484.1	491174	5091
TURBINE	1	68.06	273	1	903	95081.1	156649	917	1	85.58	242	1	1108	119551.6	138571	1558
COND.	0	4.46	12	0	355	6224.3	6638	149	1	47.08	69	0	778	65777.7	39305	193
GEN.	0	20.60	44	0	317	28783.9	25377	103	0	50.29	196	0	672	70250.2	112164	323
OTHER	0	7.89	18	0	636	11016.7	10454	112	0	41.29	201	0	687	57688.7	115373	187
UNIT	6	290.60	1363	14	8479	405970.2	781236	19588	3	206.07	1565	5	4352	287881.9	896587	7352

PLANNED OUTAGES									NONCURTAILING OUTAGES							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	472.50	3491	3	1267	660076.9	2000464	4350	1	41.07	359	0	1101	57370.7	205874	340
TURBINE	1	389.34	1802	1	875	543906.9	1032393	2001	0	25.40	0	0	16	35490.3	18	0
COND.	0	215.35	314	0	492	300846.0	179858	544	0	18.64	5	0	155	26040.2	2868	495
GEN.	0	278.40	501	2	542	388921.2	287105	2671	0	0.63	0	0	47	885.3	214	0
OTHER	0	132.87	230	1	332	185625.2	131764	1163	1	99.02	323	3	900	138326.8	184988	3731
UNIT	1	594.19	6338	8	1766	830089.6	3631584	10729								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 90-129 MW

PAGE 2 OF 2
FIGURE 3b (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 78 NO OF UNITS 209 NO OF UNIT YEARS 1397 NO OF RMA UNIT YEARS 573

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE					
	FORCED			SCHEDULED			FORCED			SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR PER OUTAGE	PERCENT PERIOD	NO OCC	DUR PER OUTAGE	PERCENT PERIOD
FULL OUTAGE	6	290.60	3.32	4	800.27	9.16	8479	47.87	3.32	6118	182.73	9.16
00.1 - 19.9	0	1.24	0.01	0	2.05	0.02	159	10.86	0.01	74	38.70	0.02
20.0 - 29.9	0	2.38	0.02	0	1.18	0.01	426	7.80	0.02	205	8.00	0.01
30.0 - 39.9	1	7.79	0.08	0	2.11	0.02	703	15.49	0.08	353	8.35	0.02
40.0 - 49.9	1	23.16	0.26	1	10.59	0.12	1599	20.23	0.26	1999	7.40	0.12
50.0 - 59.9	1	29.60	0.33	2	12.66	0.14	1942	21.29	0.33	2437	7.25	0.14
60.0 - 69.9	1	27.38	0.31	0	5.60	0.06	1423	26.87	0.31	689	11.35	0.06
70.0 - 79.9	1	45.80	0.52	1	11.02	0.12	2041	31.34	0.52	793	19.41	0.12
80.0 - 89.9	2	79.38	0.90	1	17.07	0.19	2522	43.97	0.90	768	31.05	0.19
90.0 - 99.9	2	119.46	1.36	0	9.83	0.11	2691	62.01	1.36	393	34.95	0.11
ECONOMY OUTAGE **	811.04 HOURS			9.28 % OF YEAR			1133019.87 HOURS			9.28 % OF PERIOD		
FULL OPERATION	6424.04 HOURS			73.54 % OF YEAR			8974397.44 HOURS			73.54 % OF PERIOD		

UNIT STARTS NO. OF YEARS 94

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	119.59	31.61	11242	2972

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 17792
TOTAL ECONOMY OUTAGE HOURS REPORTED 967654.73

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 130-199 MW

PAGE 1 OF 2
FIGURE 3c

SELECTED FOSSIL UNITS NO OF SYSTEMS 84 NO OF UNITS 268 NO OF UNIT YEARS 1995 NO OF RMA UNIT YEARS 884

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	14701137.63	BOILER	2.8	90.5	Data No	1650.83
SERVICE FACTOR-%	84.18	TURBINE	0.7	94.1	Longer	14231.88
AVAILABLE HOURS	15293551.88	COND.	0.0	97.3	Collected	47842.52
CAPACITY FACTOR-%	69.53	GEN.	0.2	96.4		39153.63
OUTPUT FACTOR-%	82.68	OTHER	0.3	97.8		15119.06
EQUIV F.O.R.-%	5.48	UNIT	4.1	87.5		1271.20
SCHEDULED OUT RATE-%	8.80					
FORCED OUT RATIO-%	29.14					
F.O. INCIDENT RATE-%	60.12					
EQUIV AVAILABILITY-%	85.90					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	5	212.50	1409	11	10577	423935.8	1245881	22718
TURBINE	1	56.66	146	2	1226	113030.5	129130	4471
COND.	0	4.97	24	0	364	9922.5	21216	61
GEN.	0	18.01	47	0	445	35935.2	41871	541
OTHER	1	26.33	131	1	1154	52523.9	116227	1631
UNIT	7	316.90	1758	15	13736	632209.3	1554325	29422

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	2	163.66	1207	3	4099	326493.2	1066976	6426
TURBINE	1	85.85	353	1	1946	171261.7	312240	1699
COND.	0	44.13	78	0	1002	88043.1	68738	331
GEN.	0	54.23	107	0	932	108195.2	94249	696
OTHER	1	46.10	89	0	1338	91978.4	78612	396
UNIT	3	204.97	1834	5	6612	408915.5	1620815	9548

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	454.11	4636	3	1791	905939.6	4098591	5192
TURBINE	1	373.10	1928	2	1231	744343.2	1704126	3779
COND.	0	182.17	238	0	588	363419.4	210419	473
GEN.	0	239.20	421	1	712	477206.2	372076	1178
OTHER	0	118.02	245	0	480	235447.3	216350	576
UNIT	1	565.33	7468	6	2498	1127843.2	6601562	11198

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	81.92	92	0	2434	163425.8	80892	641
TURBINE	0	11.70	2	2	191	23351.2	1678	3640
COND.	0	33.63	16	0	597	67088.8	13747	146
GEN.	0	9.85	4	0	636	19657.0	3665	48
OTHER	1	136.27	41	0	1401	271852.2	36390	504
UNIT								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 130-199 MW

PAGE 2 OF 2
FIGURE 3c (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 84 NO OF UNITS 268 NO OF UNIT YEARS 1995 NO OF RMA UNIT YEARS 884

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE							
	FORCED			SCHEDULED.			FORCED				SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD
FULL OUTAGE	7	316.90	3.62	5	770.31	8.80	13736	46.02	3.62		9110	168.68		8.80
00.1 - 19.9	0	12.59	0.14	0	1.59	0.01	586	42.84	0.14		269	11.77		0.01
20.0 - 29.9	0	5.28	0.06	0	3.20	0.03	564	18.68	0.06		785	8.12		0.03
30.0 - 39.9	1	8.25	0.09	1	3.24	0.03	1421	11.58	0.09		1151	5.61		0.03
40.0 - 49.9	1	21.51	0.24	1	10.29	0.11	2768	15.50	0.24		2265	9.06		0.11
50.0 - 59.9	2	36.40	0.41	2	15.46	0.17	4371	16.61	0.41		4186	7.36		0.17
60.0 - 69.9	2	32.23	0.36	1	11.51	0.13	3554	18.09	0.36		2298	9.99		0.13
70.0 - 79.9	3	65.34	0.74	1	19.07	0.21	6559	19.87	0.74		2534	15.01		0.21
80.0 - 89.9	3	100.08	1.14	1	19.60	0.22	6363	31.37	1.14		1756	22.26		0.22
90.0 - 99.9	2	128.21	1.46	0	9.72	0.11	3845	66.52	1.46		359	54.01		0.11
ECONOMY OUTAGE **	296.95 HOURS			3.39 % OF YEAR			592414.25 HOURS				3.39 % OF PERIOD			
FULL OPERATION	6865.41 HOURS			78.43 % OF YEAR			13696509.78 HOURS				78.43 % OF PERIOD			

UNIT STARTS NO. OF YEARS 150

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	30.80	21.84	4621	3277

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 8026
TOTAL ECONOMY OUTAGE HOURS REPORTED 523022.43

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 200-389 MW

PAGE 1 OF 2
FIGURE 3d

SELECTED FOSSIL UNITS NO OF SYSTEMS 85 NO OF UNITS 262 NO OF UNIT YEARS 1803 NO OF RMA UNIT YEARS 881

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	12922947.99	BOILER	3.9	87.6	Data No Longer Collected	1464.35
SERVICE FACTOR-%	82.91	TURBINE	1.3	92.3		9626.38
AVAILABLE HOURS	13154834.94	COND.	0.0	96.3		38577.02
CAPACITY FACTOR-%	68.10	GEN.	0.3	95.3		29022.56
OUTPUT FACTOR-%	82.74	OTHER	0.4	96.8		10035.49
EQUIV F.O.R.-%	8.50	UNIT	5.9	84.4		1059.56
SCHEDULED OUT RATE-%	10.32					
FORCED OUT RATIO-%	33.81					
F.O. INCIDENT RATE-%	63.19					
EQUIV AVAILABILITY-%	81.50					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	6	297.96	1741	13	10642	537225.7	1533453	23681
TURBINE	1	97.08	409	1	1618	175042.1	360756	1474
COND.	0	7.09	142	0	403	12779.2	125488	182
GEN.	0	22.18	118	0	536	39982.7	103768	164
OTHER	1	33.50	186	0	1552	60406.1	163455	332
UNIT	8	455.78	2596	14	14708	821774.9	2286920	25833

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	2	246.65	1695	3	4041	444704.7	1493205	6131
TURBINE	1	147.40	508	1	2394	265753.6	447410	1675
COND.	1	73.55	161	0	1036	132616.1	142117	615
GEN.	1	81.66	164	1	1129	147231.0	144727	972
OTHER	1	78.47	208	0	1523	141486.3	183200	856
UNIT	4	289.52	2736	6	6399	521996.5	2410659	10249

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	519.31	5808	3	1613	936311.3	5117017	4814
TURBINE	1	417.26	2514	1	1163	752318.0	2214458	1629
COND.	0	238.12	467	0	597	429333.9	411781	733
GEN.	0	298.84	777	1	711	538812.3	684449	2478
OTHER	0	164.10	433	1	509	295870.8	381728	1345
UNIT	1	602.61	9999	6	2166	1086513.6	8809433	10999

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	3	193.00	153	1	5208	347983.0	135078	2342
TURBINE	0	8.87	0	0	109	15993.7	157	0
COND.	0	41.03	9	0	461	73976.3	8196	18
GEN.	0	13.27	1	0	206	23922.0	1131	5
OTHER	1	72.65	47	0	952	130991.3	40995	311

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 200-389 MW

PAGE 2 OF 2
FIGURE 3d (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 85 NO OF UNITS 262 NO OF UNIT YEARS 1803 NO OF RMA UNIT YEARS 881

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE							
	FORCED			SCHEDULED			FORCED				SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD
FULL OUTAGE	8	455.78	5.27	5	892.13	10.32	14708	55.87	5.27		8565	187.80	10.32	
00.1 - 19.9	1	14.87	0.17	0	4.68	0.05	1085	24.70	0.17		611	13.81	0.05	
20.0 - 29.9	1	7.95	0.09	0	2.45	0.02	1190	12.04	0.09		543	8.12	0.02	
30.0 - 39.9	1	15.17	0.17	1	7.18	0.08	1916	14.27	0.17		1671	7.74	0.08	
40.0 - 49.9	2	37.24	0.43	2	14.64	0.16	3723	18.03	0.43		2943	8.97	0.16	
50.0 - 59.9	3	67.38	0.77	2	20.31	0.23	4996	24.31	0.77		3698	9.90	0.23	
60.0 - 69.9	4	78.71	0.91	1	15.57	0.18	7540	18.82	0.91		2591	10.83	0.18	
70.0 - 79.9	5	114.19	1.32	2	19.65	0.22	8174	25.18	1.32		3169	11.18	0.22	
80.0 - 89.9	9	270.13	3.12	2	51.12	0.59	15741	30.94	3.12		3338	27.61	0.59	
90.0 - 99.9	5	218.23	2.52	1	41.68	0.48	9023	43.60	2.52		1255	59.87	0.48	

ECONOMY OUTAGE **	128.61 HOURS	1.48 % OF YEAR	231886.95 HOURS	1.48 % OF PERIOD
FULL OPERATION	6166.32 HOURS	71.33 % OF YEAR	11117879.56 HOURS	71.33 % OF PERIOD

UNIT STARTS NO. OF YEARS 171

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	25.88	22.14	4427	3786

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 3781
TOTAL ECONOMY OUTAGE HOURS REPORTED 196524.34

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 390-599 MW

PAGE 1 OF 2
FIGURE 3e

SELECTED FOSSIL UNITS NO OF SYSTEMS 62 NO OF UNITS 135 NO OF UNIT YEARS 667 NO OF RMA UNIT YEARS 295

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	4317261.79	BOILER	5.8	84.4	Data No	1127.55
SERVICE FACTOR-%	76.62	TURBINE	2.4	89.4	Longer	4770.85
AVAILABLE HOURS	4428166.19	COND.	0.2	95.6	Collected	29345.75
CAPACITY FACTOR-%	61.04	GEN.	0.7	94.0		14827.32
OUTPUT FACTOR-%	79.73	OTHER	1.0	95.3		4367.73
EQUIV F.O.R.-%	13.28	UNIT	9.7	78.5		702.71
SCHEDULED OUT RATE-%	13.12					
FORCED OUT RATIO-%	38.71					
F.O. INCIDENT RATE-%	70.50					
EQUIV AVAILABILITY-%	75.00					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	7	403.23	4614	9	4996	268954.3	1361235	5931
TURBINE	2	165.68	873	1	1180	110508.9	257551	445
COND.	0	13.90	97	0	191	9274.3	28663	125
GEN.	1	51.27	175	0	379	34195.1	51573	179
OTHER	2	70.11	148	1	1289	46762.3	43793	445
UNIT	12	700.06	5908	11	8017	466940.3	1742815	7125

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	2	308.02	2076	2	1452	205449.2	612362	1514
TURBINE	1	172.01	446	1	824	114730.9	131579	633
COND.	0	64.25	94	0	322	42856.2	27784	75
GEN.	0	90.01	178	0	308	60038.5	52476	33
OTHER	1	88.04	365	0	555	58724.4	107635	98
UNIT	4	356.17	3159	4	2424	237565.6	931836	2353

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	602.58	6263	4	637	401919.0	1847717	2487
TURBINE	1	556.22	3923	1	544	370997.3	1157161	627
COND.	0	288.46	701	1	222	192401.3	206906	460
GEN.	0	365.40	1083	1	274	243724.6	319516	405
OTHER	0	238.41	700	0	215	159016.5	206473	223
UNIT	1	752.19	12670	6	930	501711.8	3737773	4202

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	54.94	58	0	733	36645.4	17150	8
TURBINE	0	0.05	0	0	5	31.2	40	0
COND.	0	10.84	0	0	84	7228.7	133	0
GEN.	0	0.01	0	0	1	7.8	0	0
OTHER	0	53.84	12	1	238	35913.5	3519	613

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 390-599 MW

PAGE 2 OF 2
FIGURE 3e (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 62 NO OF UNITS 135 NO OF UNIT YEARS 667 NO OF RMA UNIT YEARS 295

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE					
	FORCED			SCHEDULED			FORCED			SCHEDULED		
	NO	OUTAGE	PERCENT	NO	OUTAGE	PERCENT	NO	DUR PER	PERCENT	NO	DUR PER	PERCENT
	OCC	HOURS	OF YEAR	OCC	HOURS	OF YEAR	OCC	OUTAGE	PERIOD	OCC	OUTAGE	PERIOD
FULL OUTAGE	12	700.06	8.28	5	1108.36	13.12	8017	58.24	8.28	3354	220.41	13.12
00.1 - 19.9	1	22.16	0.26	0	9.27	0.10	445	33.21	0.26	209	29.59	0.10
20.0 - 29.9	1	24.87	0.29	0	2.31	0.02	425	39.03	0.29	155	9.95	0.02
30.0 - 39.9	1	19.55	0.23	0	3.17	0.03	907	14.37	0.23	210	10.08	0.03
40.0 - 49.9	2	30.06	0.35	1	7.85	0.09	1203	16.66	0.35	484	10.81	0.09
50.0 - 59.9	4	86.36	1.02	1	17.57	0.20	2381	24.19	1.02	732	16.00	0.20
60.0 - 69.9	3	69.72	0.82	1	11.30	0.13	2242	20.74	0.82	592	12.73	0.13
70.0 - 79.9	6	154.49	1.82	2	20.52	0.24	3962	26.00	1.82	1083	12.63	0.24
80.0 - 89.9	12	359.11	4.25	3	54.26	0.64	7976	30.03	4.25	2056	17.60	0.64
90.0 - 99.9	9	342.78	4.05	2	49.31	0.58	5820	39.28	4.05	1232	26.69	0.58
ECONOMY OUTAGE **	166.27 HOURS			1.96 % OF YEAR			110904.40 HOURS			1.96 % OF PERIOD		
FULL OPERATION	5188.00 HOURS			61.41 % OF YEAR			3460398.44 HOURS			61.41 % OF PERIOD		

UNIT STARTS NO. OF YEARS 100

ATTEMPTED SUCCESSFUL	UNIT YR AVG		CUMULATIVE	
	35.05	30.26	3505	3026

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 626
TOTAL ECONOMY OUTAGE HOURS REPORTED 35173.25

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 600 MW + ABOVE

PAGE 1 OF 2
FIGURE 3F

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	36	NO OF UNITS	94	NO OF UNIT YEARS	377	NO OF RMA UNIT YEARS	114
UNIT STATISTICS					FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
		CUMULATIVE		CAUSE CODE	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS		2183028.24		BOILER	9.0	82.5	Data No Longer Collected	788.95	
SERVICE FACTOR-%		71.11		TURBINE	3.1	89.5		3276.24	
AVAILABLE HOURS		2283528.39		COND.	0.2	96.7		21771.91	
CAPACITY FACTOR-%		57.49		GEN.	2.9	92.7		9623.32	
OUTPUT FACTOR-%		80.98		OTHER	1.3	95.5		2763.13	
EQUIV F.O.R.-%		21.17		UNIT	15.0	74.3		480.11	
SCHEDULED OUT RATE-%		13.04							
FORCED OUT RATIO-%		49.05							
F.O. INCIDENT RATE-%		78.94							
EQUIV AVAILABILITY-%		68.40							

FORCED OUTAGES									MAINTENANCE OUTAGE							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	10	575.54	3885	7	3890	216977.6	442910	2732	2	274.98	4071	2	698	103669.0	464083	566
TURBINE	2	189.73	2046	2	936	71529.2	233249	727	2	209.91	1316	0	579	79137.6	150026	144
COND.	0	12.73	43	0	140	4800.7	4931	0	0	99.27	173	0	169	37425.4	19775	4
GEN.	1	176.59	4699	0	318	66573.3	535726	109	1	139.16	872	0	207	52461.8	99364	67
OTHER	3	77.80	142	1	1110	29332.2	16230	262	1	137.93	515	0	335	52000.6	58697	63
UNIT	17	1023.08	10816	10	6393	385700.7	1233046	3830	3	328.57	6947	2	1214	123872.0	791945	844

PLANNED OUTAGES									NONCURTAILING OUTAGES							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	572.70	9256	0	343	215906.5	1055206	144	6	374.32	65	6	2158	141117.7	7410	2214
TURBINE	1	454.08	3488	1	220	171188.7	397652	226	0	4.61	0	0	12	1739.2	0	0
COND.	0	151.40	200	0	61	57076.4	22799	8	1	86.04	33	3	269	32437.7	3758	1018
GEN.	0	277.48	703	0	98	104608.6	80129	9	0	31.96	0	0	10	12049.1	0	0
OTHER	0	150.47	539	0	79	56726.3	61487	0	1	81.01	81	5	256	30541.2	9245	1968
UNIT	1	734.06	14187	1	491	276738.7	1617273	387								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 600 MW + ABOVE

PAGE 2 OF 2
FIGURE 3f (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 36 NO OF UNITS 94 NO OF UNIT YEARS 377 NO OF RMA UNIT YEARS 114

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE						
	FORCED			SCHEDULED			FORCED				SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PERCENT PERIOD
FULL OUTAGE	17	1023.08	12.56	5	1062.63	13.04	6393	60.33	12.56		1705	234.96	13.04
00.1 - 19.9	1	10.77	0.13	0	8.72	0.10	434	9.35	0.13		72	45.67	0.10
20.0 - 29.9	1	9.37	0.11	0	1.54	0.01	272	12.99	0.11		54	10.71	0.01
30.0 - 39.9	2	26.18	0.32	2	8.46	0.10	681	14.49	0.32		777	4.10	0.10
40.0 - 49.9	4	77.04	0.94	1	14.23	0.17	1630	17.81	0.94		518	10.35	0.17
50.0 - 59.9	8	161.29	1.98	3	35.38	0.43	2999	20.27	1.98		964	13.83	0.43
60.0 - 69.9	14	172.39	2.11	2	16.87	0.20	5270	12.33	2.11		663	9.59	0.20
70.0 - 79.9	20	296.30	3.63	2	16.22	0.19	7400	15.09	3.63		641	9.54	0.19
80.0 - 89.9	36	627.88	7.71	4	56.06	0.68	13393	17.67	7.71		1338	15.79	0.68
90.0 - 99.9	31	551.15	6.76	3	48.24	0.59	11653	17.83	6.76		1070	16.99	0.59
ECONOMY OUTAGE **	266.58 HOURS			3.27 % OF YEAR			100500.13 HOURS				3.27 % OF PERIOD		
FULL OPERATION	3652.42 HOURS			44.85 % OF YEAR			1376963.39 HOURS				44.85 % OF PERIOD		

UNIT STARTS NO. OF YEARS 82

ATTEMPTED SUCCESSFUL	UNIT YR AVG		CUMULATIVE	
	32.68	26.20	2680	2149

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURRENCES REPORTED 195
TOTAL ECONOMY OUTAGE HOURS REPORTED 22633.50

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 100-199 MW

PAGE 1 OF 2
FIGURE 4a

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	99	NO OF UNITS	426	NO OF UNIT YEARS	3226	NO OF RMA UNIT YEARS	1404
UNIT STATISTICS				CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
		CUMULATIVE			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS		23181959.56		BOILER	2.7	90.5	Data No		1734.05
SERVICE FACTOR-%		82.15		TURBINE	0.8	93.9	Longer		13812.20
AVAILABLE HOURS		24722669.13		COND.	0.0	97.1	Collected		43346.13
CAPACITY FACTOR-%		66.89		GEN.	0.2	96.2			39521.47
OUTPUT FACTOR-%		81.10		OTHER	0.2	97.8			16358.45
EQUIV F.O.R.-%		5.32		UNIT	4.0	87.6			1321.57
SCHEDULED OUT RATE-%		8.89							
FORCED OUT RATIO-%		28.17							
F.O. INCIDENT RATE-%		59.92							
EQUIV AVAILABILITY-%		86.10							

FORCED OUTAGES									MAINTENANCE OUTAGE							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	5	204.04	1281	13	16272	658233.6	1798158	40730	2	156.14	1075	4	6293	503707.4	1509793	11328
TURBINE	1	62.14	194	2	2042	200479.4	272945	5342	1	85.87	312	1	2887	277014.2	437995	3237
COND.	0	4.69	19	0	650	15137.2	26685	210	0	45.63	72	0	1530	147205.6	100963	514
GEN.	0	17.30	43	0	713	55819.5	60905	636	0	53.24	143	0	1398	171738.0	201175	1019
OTHER	1	18.76	87	1	1724	60519.0	122012	1741	1	43.96	134	0	1860	141816.9	188270	583
UNIT	7	305.25	1624	15	21351	984732.3	2280705	48659	3	202.13	1737	5	10158	652076.0	2438196	16681

PLANNED OUTAGES									NONCURTAILING OUTAGES							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	464.85	4180	3	2948	1499592.5	5868460	9280	1	67.35	68	0	3475	217285.4	95043	981
TURBINE	1	378.57	1868	2	2030	1221261.1	2623009	5773	0	18.15	1	1	204	58548.9	1696	3640
COND.	0	196.18	257	0	1030	632866.5	360127	1010	0	28.84	12	0	738	93037.4	16582	641
GEN.	0	256.43	455	1	1202	827247.4	639142	3788	0	6.35	3	0	673	20477.7	3871	48
OTHER	0	122.81	230	1	781	396176.1	323027	1739	1	125.19	35	1	2139	403862.5	48941	4235
UNIT	1	576.21	6990	7	4119	1858858.5	9813765	21590								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 100-199 MW

PAGE 2 OF 2
FIGURE 4a (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 99 NO OF UNITS 426 NO OF UNIT YEARS 3226 NO OF RMA UNIT YEARS 1404

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE							
	FORCED			SCHEDULED			FORCED			SCHEDULED				
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD
FULL OUTAGE	7	305.25	3.48	4	778.34	8.89	21351	46.12	3.48		14277	175.87	8.89	
00.1 - 19.9	0	8.31	0.09	0	1.78	0.02	739	36.28	0.09		333	17.23	0.02	
20.0 - 29.9	0	4.26	0.04	0	2.46	0.02	958	14.34	0.04		981	8.09	0.02	
30.0 - 39.9	1	8.43	0.09	0	2.88	0.03	2093	12.99	0.09		1479	6.28	0.03	
40.0 - 49.9	1	21.15	0.24	1	10.47	0.11	4245	16.07	0.24		4140	8.15	0.11	
50.0 - 59.9	2	34.00	0.38	2	13.92	0.15	6114	17.94	0.38		6302	7.12	0.15	
60.0 - 69.9	1	30.04	0.34	1	9.14	0.10	4786	20.24	0.34		2828	10.42	0.10	
70.0 - 79.9	3	56.73	0.64	1	16.48	0.18	8434	21.69	0.64		3293	16.14	0.18	
80.0 - 89.9	3	95.08	1.08	1	18.30	0.20	8761	35.01	1.08		2421	24.39	0.20	
90.0 - 99.9	2	123.09	1.40	0	10.10	0.11	6384	62.20	1.40		737	44.22	0.11	
ECONOMY OUTAGE **	477.59 HOURS			5.45 % OF YEAR			1540709.57 HOURS			5.45 % OF PERIOD				
FULL OPERATION	6719.33 HOURS			76.81 % OF YEAR			21676589.39 HOURS			76.81 % OF PERIOD				

UNIT STARTS NO. OF YEARS 224

ATTEMPTED SUCCESSFUL	UNIT YR AVG		CUMULATIVE	
	67.81	25.04	15190	5610

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 22717
TOTAL ECONOMY OUTAGE HOURS REPORTED 1339801.71

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 200-299 MW

PAGE 1 OF 2
FIGURE 4b

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	67	NO OF UNITS	166	NO OF UNIT YEARS	1163	NO OF RMA UNIT YEARS	578
UNIT STATISTICS				CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
CUMULATIVE					CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS		8598511.56		BOILER	3.6	88.8	Data No	1516.41	
SERVICE FACTOR-%		84.85		TURBINE	1.0	93.3	Longer	12091.50	
AVAILABLE HOURS		8723063.46		COND.	0.0	96.7	Collected	51962.46	
CAPACITY FACTOR-%		71.40		GEN.	0.2	95.8		32065.44	
OUTPUT FACTOR-%		84.28		OTHER	0.3	97.6		13007.29	
EQUIV F.O.R.-%		7.25		UNIT	5.2	86.0		1153.14	
SCHEDULED OUT RATE-%		9.21							
FORCED OUT RATIO-%		33.78							
F.O. INCIDENT RATE-%		64.63							
EQUIV AVAILABILITY-%		83.70							

	FORCED OUTAGES								MAINTENANCE OUTAGE							
	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	0	282.47	1304	14	6681	328507.1	753641	16090	2	226.32	1658	4	2271	263207.2	958424	4083
TURBINE	1	77.74	195	1	837	90416.5	112519	1205	1	129.69	344	1	1312	150827.4	198878	971
COND.	0	4.75	12	0	194	5530.0	7037	92	0	65.54	139	0	560	76221.4	80337	336
GEN.	0	18.74	123	0	315	21800.2	70946	93	1	74.31	166	1	587	86417.5	96225	649
OTHER	1	27.00	39	0	778	31400.5	22402	230	1	59.72	146	0	677	69455.8	84110	455
UNIT	8	409.45	1672	15	8786	476191.1	966545	17710	3	268.29	2453	6	3554	312023.9	1417974	6494

CAUSE CODE	PLANNED OUTAGES								NONCURTAILING OUTAGES							
	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NU OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	463.45	4976	3	967	538992.8	2876301	3343	2	134.08	89	0	2583	155935.2	51513	168
TURBINE	1	375.90	2063	1	705	437174.1	1192382	1214	0	1.01	0	0	26	1172.1	52	0
COND.	0	213.27	393	1	386	248037.0	227289	619	0	24.39	3	0	151	28361.7	1788	8
GEN.	0	267.28	779	2	442	310845.5	450090	2202	0	18.55	1	0	169	21577.2	680	0
OTHER	0	118.16	228	0	275	137423.8	131621	272	0	66.20	45	0	537	76991.5	26136	267
UNIT	1	534.31	8439	7	1253	621401.4	4877683	7650								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 200-299 MW

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FIGURE 4b (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 67 NO OF UNITS 166 NO OF UNIT YEARS 1163 NO OF RMA UNIT YEARS 578

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE						
	FORCED			SCHEDULED			FORCED			SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD
FULL OUTAGE	8	409.45	4.69	4	802.60	9.21	8786	54.19	4.69	4807	194.18	9.21	
00.1 - 19.9	1	8.66	0.09	0	3.72	0.04	679	14.83	0.09	178	24.33	0.04	
20.0 - 29.9	1	7.00	0.08	0	1.75	0.02	807	10.08	0.08	303	6.70	0.02	
30.0 - 39.9	1	13.31	0.15	1	6.66	0.07	1360	11.38	0.15	947	8.17	0.07	
40.0 - 49.9	2	35.84	0.41	2	15.97	0.18	2426	17.18	0.41	1859	9.99	0.18	
50.0 - 59.9	2	60.83	0.69	2	19.13	0.21	2906	24.34	0.69	1783	12.47	0.21	
60.0 - 69.9	5	63.10	0.72	1	13.12	0.15	5439	13.49	0.72	1627	9.37	0.15	
70.0 - 79.9	4	89.65	1.02	2	17.08	0.19	4486	23.24	1.02	1969	10.09	0.19	
80.0 - 89.9	8	214.35	2.46	1	39.70	0.45	9147	27.25	2.46	1667	27.69	0.45	
90.0 - 99.9	3	111.81	1.28	1	36.89	0.42	4067	31.97	1.28	582	73.71	0.42	
ECONOMY OUTAGE **	107.10 HOURS			1.22 % OF YEAR			124551.90 HOURS			1.22 % OF PERIOD			
FULL OPERATION	6634.81 HOURS			76.15 % OF YEAR			7716292.55 HOURS			76.15 % OF PERIOD			

UNIT STARTS NO. OF YEARS 76

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	30.46	26.55	2315	2018

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 1812
TOTAL ECONOMY OUTAGE HOURS REPORTED 104324.77

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 300-399 MW

PAGE 1 OF 2
FIGURE 4c

SELECTED FOSSIL UNITS NO OF SYSTEMS 57 NO OF UNITS 117 NO OF UNIT YEARS 703 NO OF RMA UNIT YEARS 327

UNIT STATISTICS		CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
	CUMULATIVE		CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	4747112.06	BOILER	4.6	85.5	Data No	1329.97
SERVICE FACTOR-%	79.26	TURBINE	1.8	90.6	Longer	6844.41
AVAILABLE HOURS	4866232.37	COND.	0.1	95.5	Collected	25814.06
CAPACITY FACTOR-%	63.84	GEN.	0.4	94.4		24344.97
OUTPUT FACTOR-%	80.65	OTHER	0.6	95.2		6828.80
EQUIV F.O.R.-%	11.14	UNIT	7.4	81.2		893.46
SCHEDULED OUT RATE-%	12.39					
FORCED OUT RATIO-%	33.89					
F.O. INCIDENT RATE-%	61.48					
EQUIV AVAILABILITY-%	77.30					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE				CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT		NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	6	328.20	3664	11	4502	230727.0	1198083	8072	3	283.34	1947	3	2012	199189.0	636673	2221	
TURBINE	1	129.51	817	0	874	91047.5	267221	275	2	174.57	794	1	1190	122725.7	259592	839	
COND.	0	11.01	363	0	231	7736.9	118803	90	1	86.63	203	0	543	60903.6	66447	297	
GEN.	0	29.41	102	0	245	20676.3	33503	71	1	90.76	166	0	583	63803.9	54413	329	
OTHER	1	46.24	479	0	876	32505.5	156668	110	1	110.61	457	1	950	77759.4	149555	407	
UNIT	10	541.22	5426	12	6702	380476.6	1774278	8618	5	329.51	3568	6	3209	231645.8	1166680	4093	

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NO	OUTAGE	MAN	HRS	NO	OUTAGE	MAN	HOURS	NO	OUTAGE	MAN	HRS	NO	OUTAGE	MAN	HOURS
	OCC	HOURS	HOURS	WAIT	OCC	HOURS	HOURS	WAIT	OCC	HOURS	HOURS	WAIT	OCC	HOURS	HOURS	WAIT
BOILER	1	617.69	7725	2	702	434233.0	2525997	1527	4	295.99	256	3	2901	208077.9	83565	2174
TURBINE	1	495.39	3518	1	504	348260.0	1150435	429	0	21.08	0	0	83	14821.6	105	0
COND.	0	282.95	871	0	228	198912.6	284654	123	0	67.64	20	0	319	47548.8	6408	10
GEN.	0	354.44	945	0	291	249168.6	309098	278	0	3.34	1	0	37	2344.7	451	5
OTHER	0	245.30	803	2	252	172449.1	262729	1085	1	93.57	45	0	501	65782.6	14859	44
UNIT	1	726.19	13862	5	989	510509.1	4532913	3442								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 300-399 MW

PAGE 2 OF 2
FIGURE 4c (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 57 NO OF UNITS 117 NO OF UNIT YEARS 703 NO OF RMA UNIT YEARS 327

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE						
	FORCED			SCHEDULED			FORCED			SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PERCENT PERIOD
FULL OUTAGE	10	541.22	6.35	6	1055.70	12.39	6702	56.77	6.35	4198	176.78	12.39	
00.1 - 19.9	1	29.59	0.34	1	6.20	0.07	467	44.55	0.34	474	9.18	0.07	
20.0 - 29.9	1	22.24	0.26	0	4.43	0.05	492	31.77	0.26	333	9.35	0.05	
30.0 - 39.9	1	18.85	0.22	1	8.20	0.09	614	21.57	0.22	778	7.40	0.09	
40.0 - 49.9	2	38.76	0.45	2	11.61	0.13	1360	20.03	0.45	1134	7.19	0.13	
50.0 - 59.9	3	76.26	0.89	3	21.11	0.24	2207	24.29	0.89	1983	7.48	0.24	
60.0 - 69.9	3	109.13	1.28	2	20.07	0.23	2303	33.31	1.28	1133	12.45	0.23	
70.0 - 79.9	6	156.13	1.83	2	27.07	0.31	3936	27.88	1.83	1590	11.97	0.31	
80.0 - 89.9	10	387.35	4.54	3	70.93	0.83	7148	38.09	4.54	2079	23.98	0.83	
90.0 - 99.9	7	398.09	4.67	1	55.45	0.65	5267	53.13	4.67	819	47.59	0.65	
ECONOMY OUTAGE **	169.45 HOURS			1.98 % OF YEAR			119120.31 HOURS			1.98 % OF PERIOD			
FULL OPERATION	5291.17 HOURS			62.11 % OF YEAR			3719699.27 HOURS			62.11 % OF PERIOD			

UNIT STARTS NO. OF YEARS 105

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	24.27	20.80	2549	2185

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 2161
TOTAL ECONOMY OUTAGE HOURS REPORTED 97259.21

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 400-599 MW

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FIGURE 4d

SELECTED FOSSIL UNITS NO OF SYSTEMS 58 NO OF UNITS 125 NO OF UNIT YEARS 604 NO OF RMA UNIT YEARS 271

UNIT STATISTICS		CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
	CUMULATIVE		CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	3894586.16	BOILER	5.9	84.3	Data No	1144.06
SERVICE FACTOR-%	76.39	TURBINE	2.6	89.2	Longer	4685.62
AVAILABLE HOURS	3993705.30	COND.	0.2	95.6	Collected	29988.00
CAPACITY FACTOR-%	60.81	GEN.	0.8	93.8		14320.11
OUTPUT FACTOR-%	79.63	OTHER	1.0	95.2		4291.21
EQUIV F.O.R.-%	13.28	UNIT	9.9	78.3		704.33
SCHEDULED OUT RATE-%	13.18					
FORCED OUT RATIO-%	39.12					
F.O. INCIDENT RATE-%	71.29					
EQUIV AVAILABILITY-%	75.00					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	7	408.85	3480	9	4455	246945.8	942964	5450
TURBINE	2	172.33	880	1	1087	104086.9	238567	439
COND.	0	14.55	104	0	169	8786.6	28311	125
GEN.	1	52.49	188	0	355	31701.3	50892	179
OTHER	2	71.63	104	1	1187	43262.4	28178	437
UNIT	12	715.31	4756	11	7237	432047.4	1288912	6630

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	2	310.86	1884	2	1210	187757.6	510470	1341
TURBINE	1	177.04	445	1	716	106931.3	120519	498
COND.	0	63.49	85	0	255	38347.3	23117	57
GEN.	0	94.45	172	0	267	57048.0	46565	27
OTHER	1	87.74	211	0	451	52995.5	57170	92
UNIT	3	357.44	2796	3	2060	215892.3	757841	2015

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	604.31	5765	4	581	365004.4	1562436	2431
TURBINE	1	559.41	3796	1	498	337881.1	1028802	613
COND.	0	289.38	394	1	205	174785.6	106744	451
GEN.	0	368.42	903	1	252	222522.7	244777	403
OTHER	0	240.09	715	0	197	145014.3	193851	211
UNIT	1	755.49	11574	7	854	456314.8	3136610	4109

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	34.13	63	0	457	20615.2	17150	8
TURBINE	0	0.05	0	0	5	31.2	40	0
COND.	0	8.77	0	0	75	5294.4	133	0
GEN.	0	0.01	0	0	1	7.8	0	0
OTHER	0	39.95	13	1	152	24130.7	3519	613

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 400-599 MW

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FIGURE 4d (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 58 NO OF UNITS 125 NO OF UNIT YEARS 604 NO OF RMA UNIT YEARS 271

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE						
	FORCED			SCHEDULED			FORCED				SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD
FULL OUTAGE	12	715.31	8.47	5	1112.93	13.18	7237	59.69	8.47		2914	230.68	13.18
50.1 - 19.9	1	17.74	0.21	0	9.84	0.11	384	27.89	0.21		168	35.36	0.11
20.0 - 29.9	1	11.84	0.14	0	1.34	0.01	316	22.62	0.14		62	13.05	0.01
30.0 - 39.9	1	19.29	0.22	0	2.58	0.03	849	13.72	0.22		156	10.00	0.03
40.0 - 49.9	2	30.25	0.35	1	8.11	0.09	1140	16.02	0.35		434	11.28	0.09
50.0 - 59.9	4	90.61	1.07	1	18.63	0.22	2264	24.17	1.07		664	16.94	0.22
60.0 - 69.9	3	63.44	0.75	1	10.33	0.12	2040	18.78	0.75		423	14.75	0.12
70.0 - 79.9	6	157.12	1.86	1	16.91	0.20	3714	25.55	1.86		693	14.74	0.20
80.0 - 89.9	12	339.37	4.02	3	53.52	0.63	7422	27.61	4.02		1648	19.61	0.63
90.0 - 99.9	9	351.33	4.16	2	43.28	0.51	5509	38.51	4.16		1086	24.07	0.51
ECONOMY OUTAGE **	164.10 HOURS			1.94 % OF YEAR			99119.14 HOURS				1.94 % OF PERIOD		
FULL OPERATION	5202.46 HOURS			61.63 % OF YEAR			3142286.18 HOURS				61.63 % OF PERIOD		

UNIT STARTS NO. OF YEARS 90

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	34.08	28.98	3068	2609

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 434
TOTAL ECONOMY OUTAGE HOURS REPORTED 30113.61

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 600-799 MW

PAGE 1 OF 2
FIGURE 4e

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	30	NO OF UNITS	69	NO OF UNIT YEARS	266	NO OF RMA UNIT YEARS	92
UNIT STATISTICS				CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
CUMULATIVE					CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS	1548171.19			BOILER	8.1	82.5	Data No	823.88	
SERVICE FACTOR-%	71.44			TURBINE	3.0	88.9	Longer	3862.41	
AVAILABLE HOURS	1611106.40			COND.	0.2	96.4	Collected	20250.61	
CAPACITY FACTOR-%	57.48			GEN.	3.1	92.1		10834.08	
OUTPUT FACTOR-%	80.48			OTHER	1.3	95.1		3047.56	
EQUIV F.O.R.-%	20.20			UNIT	14.2	74.3		515.05	
SCHEDULED OUT RATE-%	13.72								
FORCED OUT RATIO-%	46.46								
F.O. INCIDENT RATE-%	76.61								
EQUIV AVAILABILITY-%	68.70								

FORCED OUTAGES

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE				CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT		NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	10	517.44	4031	9	2629	137638.4	370823	2504	2	252.63	4234	2	527	67199.7	389572	478	
TURBINE	2	183.73	2222	1	560	48872.2	204448	396	2	177.74	1249	0	439	47277.6	114881	98	
COND.	0	13.35	18	0	106	3551.0	1700	0	0	98.65	104	0	109	26241.6	9557	4	
GEN.	1	189.27	322	0	199	50346.9	29604	105	1	128.85	566	0	139	34274.8	52038	63	
OTHER	3	77.60	160	1	710	20640.8	14748	214	1	135.71	464	0	235	36098.8	42730	63	
UNIT	16	970.81	6754	12	4206	258235.3	621323	3219	3	312.76	6617	3	894	83194.0	608778	706	

PLANNED OUTAGES

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	648.11	8306	1	274	172398.1	764159	140	4	178.10	81	8	1167	47375.5	7410	2214
TURBINE COND.	1	539.38	3850	1	180	143474.7	354213	190	0	0.49	0	0	2	129.3	0	0
	0	174.20	227	0	48	46337.6	20857	8	1	105.44	41	4	201	28047.0	3758	1018
GEN.	0	318.62	823	0	81	84753.9	75717	8	0	0.00	0	0	0	0.0	0	0
OTHER	0	185.62	668	0	65	49373.6	61458	0	1	51.05	100	7	155	13577.9	9245	1968
UNIT	1	805.56	13874	1	390	214280.2	1276404	346								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 600-799 MW

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FIGURE 4e (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 30 NO OF UNITS 69 NO OF UNIT YEARS 266 NO OF RMA UNIT YEARS 92

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE							
	FORCED			SCHEDULED			FORCED				SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD
FULL OUTAGE	16	970.81	11.91	5	1118.32	13.72	4206	61.39	11.91		1284	231.67	13.72	
00.1 - 19.9	1	10.66	0.13	0	1.28	0.01	279	10.16	0.13		45	7.58	0.01	
20.0 - 29.9	1	10.48	0.12	0	1.46	0.01	185	15.06	0.12		44	8.81	0.01	
30.0 - 39.9	2	27.38	0.33	3	10.61	0.13	506	14.39	0.33		730	3.86	0.13	
40.0 - 49.9	5	81.61	1.00	2	17.53	0.21	1205	18.01	1.00		421	11.07	0.21	
50.0 - 59.9	7	154.48	1.89	2	29.96	0.36	1951	21.06	1.89		548	14.54	0.36	
60.0 - 69.9	13	160.75	1.97	1	15.31	0.18	3450	12.39	1.97		394	10.33	0.18	
70.0 - 79.9	14	241.39	2.96	1	13.49	0.16	3657	17.55	2.96		352	10.19	0.16	
80.0 - 89.9	29	627.80	7.70	3	54.02	0.66	7615	21.92	7.70		806	17.82	0.66	
90.0 - 99.9	25	505.44	6.20	2	36.34	0.44	6566	20.47	6.20		615	15.71	0.44	
ECONOMY OUTAGE **	236.60 HOURS			2.90 % OF YEAR			62935.21 HOURS				2.90 % OF PERIOD			
FULL OPERATION	3820.19 HOURS			46.89 % OF YEAR			1016171.30 HOURS				46.89 % OF PERIOD			

UNIT STARTS NO. OF YEARS 64

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	32.18	25.56	2060	1636

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 148
TOTAL ECONOMY OUTAGE HOURS REPORTED 20651.99

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 800 MW + ABOVE

PAGE 1 OF 2
FIGURE 4F

SELECTED	FOSSIL UNITS	NO OF SYSTEMS	15	NO OF UNITS	33	NO OF UNIT YEARS	111	NO OF RMA UNIT YEARS	22
UNIT STATISTICS				CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES	
CUMULATIVE					CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS			634857.07	BOILER	11.1	82.3	Data No Longer Collected	715.54	
SERVICE FACTOR-%			70.30	TURBINE	3.4	90.8		2395.28	
AVAILABLE HOURS			672421.99	COND.	0.1	97.4		25800.68	
CAPACITY FACTOR-%			57.51	GEN.	2.4	93.9		7525.20	
OUTPUT FACTOR-%			81.90	OTHER	1.3	96.4		2251.93	
EQUIV F.O.R.-%			23.48	UNIT	16.7	74.4		412.71	
SCHEDULED OUT RATE-%			11.42						
FORCED OUT RATIO-%			55.27						
F.O. INCIDENT RATE-%			83.85						
EQUIV AVAILABILITY-%			67.70						

CAUSE CODE	FORCED OUTAGES								MAINTENANCE OUTAGE							
	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NO	OUTAGE	MAN	HRS	NO	OUTAGE	MAN	HOURS	NO	OUTAGE	MAN	HRS	NO	OUTAGE	MAN	HOURS
	OCC	HOURS	HOURS	WAIT	OCC	HOURS	HOURS	WAIT	OCC	HOURS	HOURS	WAIT	OCC	HOURS	HOURS	WAIT
BOILER	11	714.77	3277	2	1261	79339.1	72087	228	2	328.55	3387	1	171	36469.3	74511	88
TURBINE	3	204.12	1309	3	376	22657.0	28801	331	1	287.03	1598	0	140	31860.0	35145	46
COND.	0	11.26	147	0	34	1249.7	3231	0	1	100.75	464	0	60	11183.7	10218	0
GEN.	1	146.18	23006	0	119	16226.3	506122	4	1	163.85	2151	0	68	18186.9	47326	4
OTHER	4	78.30	67	0	400	8691.3	1482	48	1	143.26	726	0	100	15901.8	15967	0
UNIT	20	1148.34	27806	6	2187	127465.4	611723	611	3	366.47	8326	1	320	40678.0	183167	138

CAUSE CODE	PLANNED OUTAGES								NONCURTAILING OUTAGES							
	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	391.97	13229	0	69	43508.4	291047	4	9	844.52	0	0	991	93742.1	0	0
TURBINE	0	249.68	1975	0	40	27713.9	43439	36	0	14.50	0	0	10	1609.8	0	0
COND.	0	96.75	88	0	13	10738.8	1942	0	1	39.56	0	0	68	4390.7	0	0
GEN.	0	178.87	201	0	17	19854.6	4412	1	0	108.55	0	0	10	12049.1	0	0
OTHER	0	66.24	1	0	14	7352.6	29	0	1	152.82	0	0	101	16963.2	0	0
UNIT	1	562.69	15494	0	101	62458.4	340869	41								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975 800 MW + ABOVE

PAGE 2 OF 2
FIGURE 4f (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 15 NO OF UNITS 33 NO OF UNIT YEARS 111 NO OF RMA UNIT YEARS 22

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE						
	FORCED			SCHEDULED			FORCED				SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PERCENT PERIOD
FULL OUTAGE	20	1148.34	14.11	4	929.16	11.42	2187	58.28	14.11		421	244.97	11.42
00.1 - 19.9	1	11.02	0.13	0	26.56	0.32	155	7.89	0.13		27	109.17	0.32
20.0 - 29.9	1	6.73	0.08	0	1.72	0.02	87	8.58	0.08		10	19.07	0.02
30.0 - 39.9	2	23.31	0.28	0	3.31	0.04	175	14.78	0.28		47	7.80	0.04
40.0 - 49.9	4	66.09	0.81	1	6.29	0.07	425	17.26	0.81		97	7.20	0.07
50.0 - 59.9	9	177.63	2.18	4	48.35	0.59	1048	18.81	2.18		416	12.90	0.59
60.0 - 69.9	16	200.30	2.46	2	20.62	0.25	1820	12.21	2.46		269	8.50	0.25
70.0 - 79.9	34	427.90	5.25	3	22.75	0.27	3743	12.68	5.25		289	8.73	0.27
80.0 - 89.9	52	628.06	7.72	5	60.96	0.74	5778	12.06	7.72		532	12.71	0.74
90.0 - 99.9	46	660.68	8.12	4	76.76	0.94	5087	14.41	8.12		455	18.72	0.94
ECONOMY OUTAGE **	338.42 HOURS			4.15 % OF YEAR			37564.92 HOURS				4.15 % OF PERIOD		
FULL OPERATION	3250.37 HOURS			39.95 % OF YEAR			360792.09 HOURS				39.95 % OF PERIOD		

UNIT STARTS NO. OF YEARS 18

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	34.44	28.50	620	513

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 47
TOTAL ECONOMY OUTAGE HOURS REPORTED 1981.51

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975

PAGE 1 OF 2
FIGURE 5

SELECTED FOSSIL UNITS NO OF SYSTEMS 119 NO OF UNITS 998 NO OF UNIT YEARS 6933 NO OF RMA UNIT YEARS 2930

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	48279191.61	BOILER	3.5	89.0	Data No	1576.81
SERVICE FACTOR-%	80.44	TURBINE	1.2	93.0	Longer	9817.86
AVAILABLE HOURS	51301167.46	COND.	0.0	96.9	Collected	36887.91
CAPACITY FACTOR-%	63.84	GEN.	0.4	95.8		28269.72
OUTPUT FACTOR-%	80.66	OTHER	0.4	97.3		9997.77
EQUIV F.O.R.-%	7.63	UNIT	5.5	85.4		1115.38
SCHEDULED OUT RATE-%	9.76					
FORCED OUT RATIO-%	32.76					
F.O. INCIDENT RATE-%	63.09					
EQUIV AVAILABILITY-%	83.30					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	5	258.57	1784	11	38061	1792672.5	5227473	77472	2	198.27	1449	3	14003	1374621.8	4246309	21005
TURBINE COND.	1	85.87	390	1	6112	595340.7	1143231	8232	1	113.16	410	1	7283	784552.5	1202704	6023
	0	6.61	64	0	1626	45796.7	188812	534	1	55.83	106	0	3721	387038.4	311656	1342
GEN.	0	31.45	288	0	2122	218062.9	844565	1100	1	66.22	182	0	3584	459080.7	534458	2323
OTHER	1	31.66	121	0	6002	219525.7	355382	2818	1	60.11	189	0	4704	416725.4	553697	1649
UNIT	8	411.93	2648	13	53807	2855916.4	7759463	90156	3	244.96	2337	5	23013	1698280.7	6848824	32342

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE				UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
BOILER	1	487.46	4972	3	6121	3379593.3	14568102	18422	2	111.72	154	1	12068	774549.1	450760	5935
TURBINE COND.	1	401.42	2300	1	4311	2783020.3	6738736	9055	0	12.32	1	1	342	85409.3	3943	3640
	0	204.16	366	0	2090	1415448.0	1073132	2705	0	31.01	10	0	1660	215021.9	30086	1679
GEN. OTHER UNIT	0	265.23	616	1	2483	1838816.2	1804040	7190	0	8.37	2	0	935	58035.9	5183	53
	0	140.67	348	1	1702	975295.2	1018469	3705	1	96.39	95	1	4121	668267.9	277750	7134
	1	600.21	8602	6	8466	4161267.3	25202479	41077								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
FOSSIL UNITS 1966-1975

PAGE 2 OF 2
FIGURE 5 (continued)

SELECTED FOSSIL UNITS NO OF SYSTEMS 119 NO OF UNITS 998 NO OF UNIT YEARS 6933 NO OF RMA UNIT YEARS 2930

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE							
	FORCED			SCHEDULED			FORCED				SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD
FULL OUTAGE	8	411.93	4.75	5	845.17	9.76	53807	53.07	4.75		31479	186.14	9.76	
60.1 - 19.9	0	11.70	0.13	0	3.52	0.04	2787	29.10	0.13		1256	19.45	0.04	
20.0 - 29.9	0	7.14	0.08	0	2.16	0.02	2950	16.78	0.08		1782	8.41	0.02	
30.0 - 39.9	1	11.73	0.13	1	4.14	0.04	5834	13.93	0.13		4213	6.80	0.04	
40.0 - 49.9	2	28.83	0.33	1	10.96	0.12	11327	17.64	0.33		8446	8.99	0.12	
50.0 - 59.9	3	53.16	0.61	2	16.75	0.19	17378	21.20	0.61		12358	9.39	0.19	
60.0 - 69.9	3	53.52	0.61	1	11.77	0.13	20306	18.27	0.61		7219	11.30	0.13	
70.0 - 79.9	4	96.55	1.11	1	16.06	0.18	28575	23.42	1.11		8389	13.27	0.18	
80.0 - 89.9	7	197.86	2.28	1	31.56	0.36	46465	29.52	2.28		9400	23.27	0.36	
90.0 - 99.9	5	194.79	2.25	1	23.26	0.26	33875	39.86	2.25		4387	36.75	0.26	
ECONOMY OUTAGE **	435.88 HOURS			5.03 % OF YEAR			3021975.85 HOURS				5.03 % OF PERIOD			
FULL OPERATION	6188.21 HOURS			71.48 % OF YEAR			42902903.93 HOURS				71.48 % OF PERIOD			

UNIT STARTS NO. OF YEARS 637

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	45.15	27.15	28763	17298

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURRENCES REPORTED 33998
TOTAL ECONOMY OUTAGE HOURS REPORTED 2051816.89

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
NUCLEAR UNITS FOR 1966-1975

PAGE 1 OF 2
FIGURE 6

SELECTED NUCLEAR UNITS NO OF SYSTEMS 29 NO OF UNITS 49 NO OF UNIT YEARS 168 NO OF RMA UNIT YEARS 27

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	993897.77	REACTOR	7.1	81.1	Data No	1647.57
SERVICE FACTOR-%	72.76	TURBINE	2.6	93.0	Longer	4189.69
AVAILABLE HOURS	1015840.89	COND.	0.6	97.3	Collected	12416.72
CAPACITY FACTOR-%	59.49	GEN.	0.7	97.1		27316.80
OUTPUT FACTOR-%	86.33	OTHER	2.6	96.2		4176.88
EQUIV F.O.R.-%	17.27	UNIT	12.6	74.3		833.84
SCHEDULED OUT RATE-%	15.10					
FORCED OUT RATIO-%	41.03					
F.O. INCIDENT RATE-%	65.11					
EQUIV AVAILABILITY-%	69.20					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
REACTOR	5	454.50	732	2	828	76355.4	19769	321
TURBINE	2	158.98	3489	3	325	26709.1	94207	521
COND.	1	39.73	86	1	109	6674.6	2329	103
GEN.	0	42.46	7	0	49	7134.0	179	0
UTHER	2	159.26	1030	0	326	26755.8	27815	2
UNIT	10	854.94	5344	6	1637	143629.1	144299	947

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
REACTOR	2	301.51	2790	1	259	50653.5	75342	109
TURBINE	1	157.53	310	0	149	26465.1	8362	1
COND.	0	58.86	116	0	78	9887.8	3132	15
GEN.	0	102.63	2	0	29	17242.5	63	0
UTHER	0	60.86	121	0	79	10224.2	3265	2
UNIT	3	341.63	3339	1	461	57394.1	90164	127

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
REACTOR	2	773.78	5041	8	342	129994.2	136095	1378
TURBINE	0	248.08	928	0	66	41677.4	25065	28
COND.	0	114.08	144	0	24	19165.6	3897	7
GEN.	0	90.49	97	0	19	15202.5	2620	0
UTHER	0	81.59	350	0	32	13707.1	9443	19
UNIT	2	886.76	6560	9	416	148975.8	177120	1432

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
REACTOR	4	361.52	16	0	741	60736.1	445	0
TURBINE	1	110.89	3	0	90	18630.1	35	0
COND.	1	153.34	2	0	128	25760.7	43	0
GEN.	0	36.15	2	0	29	6073.6	43	0
UTHER	1	78.19	34	8	166	13135.0	928	1292

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

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EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
NUCLEAR UNITS FOR 1966-1975

PAGE 2 OF 2
FIGURE 6 (continued)

SELECTED NUCLEAR UNITS NO OF SYSTEMS 29 NO OF UNITS 49 NO OF UNIT YEARS 168 NO OF RMA UNIT YEARS 27

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE					
	FORCED			SCHEDULED			FORCED			SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	NO OCC	DUR OUTAGE	PERCENT PERIOD
FULL OUTAGE	10	854.94	10.51	5	1228.39	15.10	1637	87.73	10.51	877	235.31	15.10
60.1 - 19.9	1	11.51	0.14	0	20.63	0.25	122	15.84	0.14	65	53.32	0.25
20.0 - 29.9	1	15.41	0.18	1	7.28	0.08	146	17.72	0.18	116	10.54	0.08
30.0 - 39.9	1	26.43	0.32	1	19.81	0.24	128	34.69	0.32	111	29.98	0.24
40.0 - 49.9	1	80.09	0.98	1	29.79	0.36	227	59.27	0.98	183	27.34	0.36
50.0 - 59.9	2	131.62	1.61	1	13.16	0.16	271	81.59	1.61	96	23.02	0.16
60.0 - 69.9	2	122.90	1.51	1	24.62	0.30	314	65.75	1.51	133	31.09	0.30
70.0 - 79.9	3	247.49	3.04	1	51.00	0.62	541	76.85	3.04	155	55.27	0.62
80.0 - 89.9	3	265.29	3.26	1	56.91	0.69	554	80.44	3.26	238	40.17	0.69
90.0 - 99.9	6	475.51	5.84	1	44.75	0.55	990	80.69	5.84	173	43.45	0.55

ECONOMY OUTAGE ** 130.61 HOURS 1.60 % OF YEAR 21943.12 HOURS 1.60 % OF PERIOD
FULL OPERATION 4271.86 HOURS 52.54 % OF YEAR 717673.29 HOURS 52.54 % OF PERIOD

UNIT STARTS NO. OF YEARS 53

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	21.15	15.66	1121	830

NUCLEAR SAFETY SYSTEMS TESTS

UNIT YR AVG						CUMULATIVE					
TEST OCC	PARTIAL SUCCESS		UNSUCCESSFUL			TEST OCC	PARTIAL SUCCESS		UNSUCCESSFUL		
	NO	MANHOURS	NO	MANHOURS	DURATION		NO	MANHOURS	NO	MANHOURS	DURATION
7	0	2	0	0	0.00	1160	3	256	0	0	0.0

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 16
TOTAL ECONOMY OUTAGE HOURS REPORTED 4175.16

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EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
JET ENGINES FOR 1966-1975

PAGE 1 OF 2
FIGURE 7

SELECTED JET ENGINE UNITS NO OF SYSTEMS 38 NO OF UNITS 332 NO OF UNIT YEARS 1394 NO OF RMA UNIT YEARS 330

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	1341201.27	JET ENG	31.5	90.6	Data No	875.63
SERVICE FACTOR-%	11.58	TURBINE	4.5	99.0	Longer	15921.57
AVAILABLE HOURS	9918342.56	GEN.	15.6	96.6	Collected	10981.95
CAPACITY FACTOR-%	9.13	OTHER	5.6	98.8		11426.44
OUTPUT FACTOR-%	68.99	UNIT	43.0	85.6		723.02
EQUIV F.O.R.-%	49.79					
SCHEDULED OUT RATE-%	5.56					
FORCED OUT RATIO-%	61.11					
F.O. INCIDENT RATE-%	48.08					
EQUIV AVAILABILITY-%	83.90					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
JET ENG	9	444.18	876	10	13218	619190.8	289113	14294
TURBINE	1	46.13	61	4	726	64307.6	20001	6199
GEN.	1	178.78	166	4	1053	249216.1	34896	5049
OTHER	1	57.33	24	1	1012	79912.4	7863	1734
UNIT	11	726.35	1066	20	16008	1012525.6	351873	27276

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
JET ENG	8	199.99	460	1	11833	278788.9	151833	1615
TURBINE	0	22.16	203	0	597	30892.1	66990	303
GEN.	1	43.55	33	0	1101	60711.8	10794	337
OTHER	1	17.93	57	0	1367	24991.7	18853	90
UNIT	11	251.22	753	2	14769	350196.8	248470	2345

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
JET ENG	1	135.25	402	3	1999	188543.6	132588	4039
TURBINE	0	11.71	31	0	77	16320.1	10123	8
GEN.	0	52.33	17	1	261	72944.9	5671	1459
OTHER	0	18.47	11	0	207	25742.8	3762	12
UNIT	2	216.85	461	4	2516	293918.9	152144	5518

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
JET ENG	0	7.72	10	0	123	10764.8	3209	144
TURBINE	0	1.20	0	0	7	1675.6	0	0
GEN.	0	1.96	0	0	5	2728.6	36	10
OTHER	0	0.00	0	0	1	6.5	0	0

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

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EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
JET ENGINES FOR 1966-1975

PAGE 2 OF 2
FIGURE 7 (continued)

SELECTED JET ENGINE UNITS NO OF SYSTEMS 38 NO OF UNITS 332 NO OF UNIT YEARS 1394 NO OF RMA UNIT YEARS 330

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE					
	FORCED			SCHEDULED			FORCED			SCHEDULED		
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	NO OCC	DUR OUTAGE	PER PERIOD
FULL OUTAGE	11	726.35	8.74	12	462.06	5.56	16008	63.25	8.74	17285	37.26	5.56
00.1 - 19.9	0	6.21	0.07	0	2.27	0.02	266	32.52	0.07	257	12.28	0.02
20.0 - 29.9	0	5.54	0.06	0	3.72	0.04	217	35.55	0.06	141	36.81	0.04
30.0 - 39.9	0	10.60	0.12	0	4.30	0.05	319	46.33	0.12	112	53.57	0.05
40.0 - 49.9	0	13.30	0.16	0	8.01	0.09	414	44.79	0.16	131	85.27	0.09
50.0 - 59.9	1	70.09	0.84	0	25.52	0.30	1920	50.88	0.84	618	57.55	0.30
60.0 - 69.9	1	35.87	0.43	0	10.16	0.12	983	50.86	0.43	251	56.41	0.12
70.0 - 79.9	3	58.88	0.70	1	12.55	0.15	3617	22.69	0.70	777	22.52	0.15
80.0 - 89.9	1	41.55	0.50	0	8.16	0.09	1088	53.23	0.50	287	39.65	0.09
90.0 - 99.9	0	36.62	0.44	0	2.59	0.03	564	90.50	0.44	66	54.65	0.03
ECONOMY OUTAGE **	6152.90 HOURS			74.10 % OF YEAR			8577141.29 HOURS			74.10 % OF PERIOD		
FULL OPERATION	606.17 HOURS			7.30 % OF YEAR			845013.11 HOURS			7.30 % OF PERIOD		

UNIT STARTS NO. OF YEARS 1130

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	201.83	172.07	228076	194449

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 3560
TOTAL ECONOMY OUTAGE HOURS REPORTED 157689.03

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
GAS TURBINES FOR 1966-1975

PAGE 1 OF 2
FIGURE 8

SELECTED GAS TURBINE UNITS NO OF SYSTEMS 71 NO OF UNITS 593 NO OF UNIT YEARS 2764 NO OF RMA UNIT YEARS 574

UNIT STATISTICS	CUMULATIVE	CAUSE CODE	FORCED OUTAGE RATE	OPERATING AVAILABILITY	RELATIVE MECH AVAILABILITY	MEAN TIME BETWEEN FULL FORCED OUTAGES
			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE
SERVICE HOURS	3096251.37	GAS TUR	31.3	88.3	Data No	892.45
SERVICE FACTOR-%	13.66	GEN.	4.9	99.0	Longer	16387.55
AVAILABLE HOURS	19617316.32	OTHER	2.7	99.2	Collected	9015.11
CAPACITY FACTOR-%	11.24	UNIT	35.1	86.5		771.54
OUTPUT FACTOR-%	77.33					
EQUIV F.O.R.-%	35.78					
SCHEDULED OUT RATE-%	6.03					
FORCED OUT RATIO-%	55.11					
F.O. INCIDENT RATE-%	55.97					
EQUIV AVAILABILITY-%	86.30					

FORCED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
GAS TUR	9	510.86	557	7	25394	1412005.9	319976	18308
REGUL.	0	0.00	0	0	1	4.0	0	0
GEN.	1	58.69	29	0	1382	162231.3	16557	872
OTHER	1	31.86	60	0	2513	88057.3	34695	616
UNIT	11	607.56	648	7	29374	1679294.7	371877	19844

MAINTENANCE OUTAGE

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
GAS TUR	5	229.23	414	3	14693	633595.0	237549	7619
REGUL.	0	0.00	0	0	0	0.0	0	0
GEN.	0	13.35	124	0	1298	36912.8	70981	239
OTHER	1	15.71	12	0	2206	43431.9	6621	82
UNIT	7	256.55	550	3	18178	709115.1	315642	8364

PLANNED OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
GAS TUR	1	216.77	339	3	4063	599153.3	194572	8935
REGUL.	0	0.00	0	0	0	0.0	0	0
GEN.	0	5.86	4	0	263	16193.4	2107	100
OTHER	0	13.79	10	0	601	38116.8	5787	269
UNIT	2	238.16	359	3	4928	658265.7	205917	9320

NONCURTAILING OUTAGES

CAUSE CODE	UNIT YR AVG				CUMULATIVE			
	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
GAS TUR	0	108.43	1	0	200	299706.7	631	409
REGUL.	0	0.00	0	0	0	0.0	0	0
GEN.	0	0.41	0	0	23	1119.6	84	0
OTHER	0	0.02	0	0	14	59.6	4	0

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
GAS TURBINES FOR 1966-1975

PAGE 2 OF 2
FIGURE 8 (continued)

SELECTED GAS TURBINE UNITS NO OF SYSTEMS 71 NO OF UNITS 593 NO OF UNIT YEARS 2764 NO OF RMA UNIT YEARS 574

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE							
	FORCED			SCHEDULED			FORCED				SCHEDULED			
	NU	OUTAGE	PERCENT	NU	OUTAGE	PERCENT	NU	DUR	PER	PERCENT	NO	DUR	PER	PERCENT
	UCC	HOURS	OF YEAR	UCC	HOURS	OF YEAR	OCC	OUTAGE	PERIOD	PERIOD	OCC	OUTAGE	PERIOD	PERIOD
FULL OUTAGE	11	607.56	7.40	8	494.71	6.03	29374	57.16	7.40		23106	59.17	6.03	
00.1 - 19.9	0	0.53	0.00	0	0.10	0.00	38	38.59	0.00		12	23.66	0.00	
20.0 - 29.9	0	0.22	0.00	0	0.00	0.00	14	43.36	0.00		11	0.56	0.00	
30.0 - 39.9	0	0.19	0.00	0	0.11	0.00	17	31.31	0.00		16	19.67	0.00	
40.0 - 49.9	0	0.24	0.00	0	1.33	0.01	15	43.74	0.00		7	524.57	0.01	
50.0 - 59.9	0	2.97	0.03	0	0.03	0.00	99	83.04	0.03		2	35.77	0.00	
60.0 - 69.9	0	4.78	0.05	0	5.12	0.06	72	183.39	0.05		55	257.51	0.06	
70.0 - 79.9	0	2.71	0.03	0	0.00	0.00	149	50.31	0.03		1	1.41	0.00	
80.0 - 89.9	0	27.05	0.32	0	0.17	0.00	588	127.14	0.32		7	67.30	0.00	
90.0 - 99.9	0	39.31	0.47	0	0.21	0.00	796	136.49	0.47		19	30.90	0.00	
ECONOMY OUTAGE **	5977.23 HOURS			72.89 % OF YEAR			16521064.95 HOURS				72.89 % OF PERIOD			
FULL OPERATION	1035.12 HOURS			12.62 % OF YEAR			2861084.30 HOURS				12.62 % OF PERIOD			

UNIT STARTS NO. OF YEARS 2202

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	192.99	159.35	424965	350895

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 16738
TOTAL ECONOMY OUTAGE HOURS REPORTED 871064.68

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
DIESEL UNITS FOR 1966-1975

PAGE 1 OF 2
FIGURE 9

SELECTED	DIESEL UNITS	NO OF SYSTEMS	29	NO OF UNITS	224	NO OF UNIT YEARS	1186	NO OF RMA UNIT YEARS	117
UNIT STATISTICS				CAUSE	FORCED	OPERATING	RELATIVE MECH	MEAN TIME BETWEEN	
				CODE	OUTAGE RATE	AVAILABILITY	AVAILABILITY	FULL FORCED OUTAGES	
		CUMULATIVE			CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE-%	CUMULATIVE	
SERVICE HOURS	990783.95	DIESEL	25.4	95.6	Data No	1092.95			
SERVICE FACTOR-%	9.80				Longer				
AVAILABLE HOURS	9597464.31	GEN.	3.9	99.5	Collected	33333.38			
CAPACITY FACTOR-%	6.38	OTHER	1.3	99.8		45495.56			
OUTPUT FACTOR-%	80.44	UNIT	28.3	95.0		1034.51			
EQUIV F.O.R.-%	31.44								
SCHEDULED OUT RATE-%	1.09								
FORCED OUT RATIO-%	77.94								
F.O. INCIDENT RATE-%	62.70								
EQUIV AVAILABILITY-%	94.50								

FORCED OUTAGES									MAINTENANCE OUTAGE							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
DIESEL	8	284.51	46	2	9240	337432.3	5402	1863	3	53.33	63	0	3567	63244.5	7398	467
GEN.	0	34.48	8	1	302	40894.1	904	959	0	2.62	7	0	169	3104.0	780	64
OTHER	0	11.32	2	0	221	13420.1	215	500	0	3.07	1	0	257	3645.7	116	312
UNIT	8	330.30	56	3	9762	391738.4	6521	3322	3	58.54	71	1	3990	69424.4	8294	843

PLANNED OUTAGES									NONCURTAILING OUTAGES							
UNIT YR AVG					CUMULATIVE				UNIT YR AVG				CUMULATIVE			
CAUSE CODE	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HRS WAIT	NO OCC	OUTAGE HOURS	MAN HOURS	HOURS WAIT
DIESEL	1	33.98	22	0	1701	40305.0	2623	28	1	67.79	18	0	984	80394.4	2103	353
GEN.	0	1.19	2	0	81	1412.4	189	0	0	0.44	1	0	7	523.5	137	0
OTHER	0	0.29	0	0	36	346.3	18	0	0	0.02	0	0	7	18.5	8	0
UNIT	2	34.90	24	0	1817	41388.8	2830	28								

** UNIT YEAR AVERAGES OF MAN HOURS AND RELATIVE MECHANICAL AVAILABILITY ARE BASED ON RMA UNIT YEARS

EDISON ELECTRIC INSTITUTE EQUIPMENT AVAILABILITY
COMPOSITE UNIT SUMMARY REPORT 1975
DIESEL UNITS FOR 1966-1975

PAGE 2 OF 2
FIGURE 9 (continued)

SELECTED DIESEL UNITS NO OF SYSTEMS 29 NO OF UNITS 224 NO OF UNIT YEARS 1186 NO OF RMA UNIT YEARS 117

PROBABILITY STATE - COMBINED UNIT

PERCENTAGE AVAILABLE CATEGORIES	UNIT YR AVG						CUMULATIVE						
	FORCED			SCHEDULED			FORCED			SCHEDULED			
	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	OUTAGE HOURS	PERCENT OF YEAR	NO OCC	DUR OUTAGE	PER PERIOD	PERCENT PERIOD	NO OCC	DUR OUTAGE	PER PERIOD
FULL OUTAGE	8	330.30	3.87	5	93.43	1.09	9762	40.12	3.87		5807	19.08	1.09
00.1 - 19.9	0	3.93	0.04	0	0.35	0.00	35	133.13	0.04		15	27.35	0.00
20.0 - 29.9	0	0.00	0.00	0	0.00	0.00	1	0.40	0.00		0	0.00	0.00
30.0 - 39.9	0	17.56	0.20	0	1.23	0.01	88	236.64	0.20		36	40.64	0.01
40.0 - 49.9	0	1.70	0.01	0	0.18	0.00	16	126.15	0.01		6	34.92	0.00
50.0 - 59.9	0	16.28	0.19	0	2.59	0.03	160	120.68	0.19		41	74.81	0.03
60.0 - 69.9	0	4.06	0.04	0	3.32	0.03	71	67.80	0.04		69	57.07	0.03
70.0 - 79.9	0	43.17	0.50	0	5.15	0.06	408	125.47	0.50		106	57.65	0.06
80.0 - 89.9	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00		0	0.00	0.00
90.0 - 99.9	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00		0	0.00	0.00
ECONOMY OUTAGE **	7256.90 HOURS			85.21 % OF YEAR			8606680.36 HOURS			85.21 % OF PERIOD			
FULL OPERATION	735.88 HOURS			8.64 % OF YEAR			872762.44 HOURS			8.64 % OF PERIOD			

UNIT STARTS NO. OF YEARS 558

	UNIT YR AVG		CUMULATIVE	
	ATTEMPTED	SUCCESSFUL	ATTEMPTED	SUCCESSFUL
	261.61	237.17	145981	132346

** ECONOMY OUTAGE HOURS DERIVED FROM AVAILABLE HOURS - SERVICE HOURS
TOTAL ECONOMY OUTAGE OCCURANCES REPORTED 761
TOTAL ECONOMY OUTAGE HOURS REPORTED 57123.25

FIGURE 10

EEI EQUIPMENT AVAILABILITY
 **QUARTERLY OPERATING DATA
 FOSSIL UNITS
 600 MW AND ABOVE

	<u>3rd Quarter 1975</u>	<u>4th Quarter 1975</u>	<u>1st Quarter 1976^r</u>	<u>2nd Quarter 1976^P</u>
Number of Units	87	90	93	94
Number of Quarterly Blocks	87	90	93	94
Quarter	3	4	1	2
Period Hours	2,208.00	2,208.00	2,184.00	2,184.00
Service Hours - AVG	1,768.63	1,481.20	1,502.50	1,466.05
Available Hours - AVG	1,807.71	1,545.65	1,538.30	1,474.88
Forced Outage Hours Total	22,658.41	20,683.34	19,869.96	23,067.83
Occurrences	468	379	427	422
Planned Outage Hours Total	6,282.59	25,368.85	32,505.96	32,049.31
Occurrences	29	43	61	50
Maintenance Outage Hours Total	4,767.44	8,192.03	9,784.59	7,762.06
Occurrences	61	62	70	71
Reserve Shutdown Hours Total	3,400.17	5,799.95	3,329.93	829.27
Occurrences	32	65	72	40
Forced Partial Outage Hours Total	67,022.71	55,513.94	77,425.29	66,353.14
Occurrences	4,414	3,338	3,277	2,796
Scheduled Partial Outage Hours Total	2,658.58	7,911.67	10,085.63	10,162.35
Occurrences	335	407	366	367
Operating Availability	81.80	70.00	70.40	67.50
Equivalent Availability	74.90	63.40	63.60	61.20
Capacity Factor	61.78	52.98	54.70	53.09

** Caution: Quarterly comparisons may vary radically because of maintenance and other cyclical events.

^r: Revised

^P: Preliminary

APPENDIX

A. EQUIPMENT DEFINITIONS

1. Component	Part within a "major equipment" group, such as: superheater tube, governor, buckets, boiler feed pump.
2. Header Unit	Unit in which the turbine-generator is not solely and independently connected to single boiler.
3. Major Equipment	Major group of equipment within a unit, such as: boiler, reactor, generator, steam turbine, condenser.
4. Maximum Dependable Capacity (MDC)	The dependable main-unit capacity winter or summer, whichever is smaller.
5. Non-header Unit	Unit in which a single boiler is connected solely and independently to a given turbine-generator.

B. OPERATION AND OUTAGE DEFINITIONS

1. Available	The status of a unit or major piece of equipment which is capable of service, whether or not it is actually in service.
2. Base Loading	When a unit is generally run at or near rated output.
3. Cranking Loading	When a unit is generally shut down on standby for auxiliary power during emergency.
4. Cycling Loading	When a unit is generally run but at a load which varies widely with system demand.
5. Economy Outage	(See Reserve Shutdown)
6. Forced Outage	The occurrence of a component failure or other condition which requires that the unit be removed from service immediately or up to and including the very next weekend.

APPENDIX (continued)

7. Forced Partial Outage	The occurrence of a component failure or other condition which requires that the load on the unit be reduced 2% or more immediately or up to and including the very next weekend.
8. Maintenance Outage	The removal of a unit from service to perform work on specific components which could have been postponed past the very next weekend. This is work done to prevent a potential forced outage and which could not be postponed from season to season.
9. Non-curtailing Equipment Outage	The removal of a specific component from service for repair, which causes no reduction in unit load or a reduction of less than 2%.
10. Non-operating Equipment Test	A scheduled test or required operation of a back-up system which is not normally operating.
11. Outage Cause	A component failure, preventive maintenance or other condition which requires that the unit or a component be taken out of service or run at reduced capacity.
12. Peak Loading	When a unit is generally shut down and is run only during high demand periods.
13. Planned Outage	The removal of a unit from service for inspection and/or general overhaul of one or more major equipment groups. This is work which is usually scheduled well in advance (e.g., annual boiler overhaul, five-year turbine overhaul).
14. Reserve Shutdown	The removal of a unit from service for economy or similar reasons. This status continues as long as the unit is out but available for operation.

APPENDIX (continued).

15. Scheduled Partial Outage
- The occurrence of a component failure or other condition which requires that the load on the unit be reduced 2% or more but where this reduction could be postponed past the very next weekend.
16. Unavailable
- The status of any major piece of equipment which renders it inoperable because of the failure of a component, work being performed or other adverse condition.

C. TIME DEFINITIONS

1. Available Hours (AH)
- The time in hours during which a unit or major equipment is available; SH + RSH.
2. Demand Period
- The time interval each day which is the period of maximum demand on a particular system.
3. Economy Outage Hours (See Reserve Shutdown Hours) (TEOH)
- The theoretical value of Economy Outage Hours (TEOH) is the difference between Available Hours and Service Hours. If the TEOH differs by less than 1% with the Economy Outage Hours reported at the end of the year, they are considered equal and flagged with Code 1. If the difference is more than 1%, but less than 10%, they are flagged with Code 3; but the reported Economy Outage Hours are still used. However, if the difference is greater than 10%, the calculated value TEOH is used, and Code 2 is a flag that Economy Outage Hours have been derived.
4. Equivalent Forced Outage Hours (EFOH)
- $\sum [\text{Forced Partial Outage Hours} \times \text{Size of Reduction/MDC}]$
5. Equivalent Scheduled Outage Hours (ESOH)
- $\sum [\text{Scheduled Partial Outage Hours} \times \text{Size of Reduction/MDC}]$
6. Forced Outage Hours (FOH)
- The time in hours during which a unit or major equipment was unavailable due to a Forced Outage.
7. Forced Partial Outage Hours (FPOH)
- The time in hours during which a unit or major equipment is unavailable for full load due to a Forced Partial Outage.

APPENDIX (continued)

8. Hours Waiting (HW)	That portion of time for any outage during which no work could be performed. This includes time for cooling down equipment and shipment of parts. This is time that could not be affected by a change in work schedule or the number of men worked.																		
9. Maintenance Outage Hours (MOH)	The time in hours during which a unit or major equipment is unavailable due to a maintenance outage.																		
10. Period Hours (PH)	The clock hours in the period under consideration. (Generally one year).																		
11. Planned Outage Hours (POH)	The time in hours during which a unit or major equipment is unavailable due to a planned outage.																		
12. Reserve Shutdown Hours (RSH)	Reserve shutdown duration in hours.																		
13. Scheduled Partial Outage Hours (SPOH)	The time in hours during which a unit or major equipment is unavailable for full load due to a scheduled partial outage.																		
14. Service Hours (SH)	The total number of hours the unit was actually operated with breakers closed to the station bus.																		
15. Unit Years (UY)	This term is the common denominator used or normalize data from units of the same type with different lengths of service. The following example contains 20 UY of experience from 4 units.																		
	<table border="0" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th><u>TOTAL</u></th> </tr> </thead> <tbody> <tr> <td>Unit</td> <td></td> <td></td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>Years in Service</td> <td>8</td> <td>3</td> <td>7</td> <td>2</td> <td>20</td> </tr> </tbody> </table>		A	B	C	D	<u>TOTAL</u>	Unit					4	Years in Service	8	3	7	2	20
	A	B	C	D	<u>TOTAL</u>														
Unit					4														
Years in Service	8	3	7	2	20														
16. Work (manhours Worked) (MH)	The total number of manhours worked on or off site to accomplish repairs.																		

D. EQUATIONS

1. Average Forced Outage Duration
2. Capacity Factor

(Summation of FOH)/(Number of Forced Outages)

$$\left[\frac{\text{Total Gross Generation in MW-Hr}}{\text{PH} \times \text{MDC}} \right] 100$$

APPENDIX (continued)

3. Component Outage Severity Index The average number of forced outage hours of a specific component per incident.
4. Equivalent Availability $[AH - (EFOH + ESOH)] / PH \times 100$
5. Equivalent Forced Outage Rate (EFOR)
(for each forced partial outage, an equivalent full load outage duration is calculated to include the effect of partial as well as full forced outages on the forced outage rate). $[(FOH + EFOH) / (FOH + EFOH + SH)]$
6. Forced Outage Incident $\left[\frac{(\text{Forced Incidents})}{(\text{Forced} + \text{Maintenance} + \text{Planned Incidents})} \right] 100$
7. Forced Outage Rate $[FOH / (SH + FOH)] 100$
8. Forced Outage Ratio $[FOH / (\text{Total Unavailable Hours})] 100$
9. Mean Duration of Starting Failure Outage $(\text{Starting Failure Outage Hours}) / (\text{Number of Starting Failures})$
10. Mean Time Between Full Forced Outages $(\text{Summation of SH}) / [(\text{Number of Full Forced Outages}) + 1]$
11. Operating Availability $[AH / PH] 100$
12. Output Factor $(\text{Total gross generation in MW-Hr}) \times 100 / (SH \times MDC)$
13. Relative Mechanical Availability (RMA) Relative Mechanical Availability is a form of Operating Availability adjusted to show relative effort. The prime assumption is that most outage time is affected by work schedules and crew sizes. Relative Mechanical Availability uses an Adjusted Outage Time (AOT) based on effort. Manhours worked is a measure of effort which is reasonably independent of work schedules and crew sizes. Manhours worked (MH) divided by a standard work force (SWF) gives a derived time worked based on effort. If we assume a round-the-clock schedule, then this derived

APPENDIX (continued)

13. Relative Mechanical Availability (RMA)*
(continued)

*(Data collected on an optional basis, not summarized for use as an industry average).

time worked is almost a derived outage time based on effort. The difference is the amount of outage time which is independent of effort called Hours Waiting (HW), See Appendix C-6. An arbitrary assumption of ten men for the standard work force gives:

$$AOT = HW + MW/10$$

Then substituting AOT for outage time in the equation for operating availability gives:

$$RMA = \frac{[(PH-AOT)/PH] 100}{[(PH-(HW + MH/10))/PH] 100}$$

Reporting this data is optional.

14. Service Factor
15. Scheduled Outage Rate
16. Starting Failure Ratio

$$[SH/PH] 100$$

$$[SOH/(SH + SOH)] 100$$

$$\frac{(\text{Number of Starting Failures})}{(\text{Total Number of Starting Attempts})}$$

APPENDIX E

CAUSE CODE TABLES

BOILER**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
100	Boiler, General Code; see codes 500-545 for additional classifications	127	Soot Blowers
101	Water Walls	128	Boiler Circulating Pumps
102	Generating Tubes	129	Air Compressors (sootblowing, control and station air)
103	Superheater	130	Precipitator - Electrical
104	Reheater - First	131	Precipitator - Mechanical
105	Reheater - Second	132	Burners
106	Economizer	133	Explosion
107	Air Preheater - Tubular	134	Boiler Controls
108	Air Preheater - Regenerative	135	Stack Emission (also see code 507)
109	Induced Draft Fans	136	Furnace Slagging
110	Forced Draft Fans	137	Superheater Fouling
111	Recirculating Fans	138	Reheater Fouling
112	Desuperheaters and Attenuators	139	Air Heater Fouling
113	By-Pass Dampers	140	Induced Draft Fan Fouling
114	Furnace Refractory	141	Precipitator Fouling
115	Safety Valves	142	Wet Coal
116	Steam Valves and Piping	143	Poor Quality Fuel (low Btu) (also see code 502, 503)
117	Valves and Piping - Feedwater and Blowdown	144	Drum, Steam Scrubbers and Separators, etc
118	Gage Glasses	145	Pulverizer Capacity Limited (due to wear, but still in service)
119	Slag and Fly Ash Disposal System	146	Ashpit Trouble
120	Stack	147	Fly Ash Disposal Trouble (also see code 502, 503)
121	Pulverizers	148	Startup System (superheater or turbine by-pass system)
122	Cyclones	149	Light-Off System (ignitors, purging system, etc)
123	Fuel Handling Equipment (gas, oil, coal, etc)	150	Headers
124	Fireside Cleaning	151	Inspection, License, Insurance (also see codes 500-545)
125	Acid Cleaning	152	Flue-Gas-Scrubber-(particulate only) USE CODES 400-450 FOR FLUE GAS SCRUBBERS
126	Boiler Casing, Breeching and Ducts	153	Flue-Gas-Scrubber-(particulate and-gas-absorption) USE CODES 400-450 FOR FLUE GAS SCRUBBERS
		*160	Auxiliary Boiler
		199	Miscellaneous; see codes 500-545 for additional classifications

New Code Addition (effective 1/1/76)

Code 100-199 are to be used specifically for equipment failures, use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

DIESEL ENGINE*

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
100	Diesel Engine, General Code; see codes 500-545 for additional classifications	180	Governor
170	Drive Shaft and Bearings	181	Lube Oil System
171	Fuel System	182	Engine Cooling System
172	Pistons	183	Heater Elements
173	Cylinders	184	Control Power Transformer
174	Cylinder Heads	185	Vibration
175	Battery and Battery Charger System	186	Intake Valves
176	Engine Starting System	187	Exhaust Valves
177	Synchronizing System	188	Hydraulic Lock (water in cylinders)
178	Air Filter System	189	Engine Control System
179	Turbo Charger	190	Overhaul
		199	Miscellaneous; see codes 500-545 for additional classifications

* Codes 100-199 are to be used specifically for equipment failures,
use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

NUCLEAR REACTOR*

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
200	Reactor, General Code; see codes 500-545 for additional classification	228	Auxiliary System Valves and Piping
201	Reactor Vessel	229	Safety System Valves and Piping
202	Reactor Internals Including Core Support and Control Rod Guide Structures	240	Reactor Containment
203	Reactor Coolant System Valves and Piping	241	Reactor Containment Test
204	Reactor Coolant Recirculating Pumps and Drives	242	Reactor Containment Cooling and Ventilation - Normal
205	Steam Generator (Reactor Coolant System)	243	Reactor Containment Cooling and Gas Cleanup - Post Accident
206	Pressurizer	244	Auxiliary Building Ventilation System
207	Control Rods and Drives	250	Plant Radiation Levels
208	Reactivity Limitation	251	Radioactivity Discharge
209	Fuel Assembly Including Cladding, Burnable Poison Rods and Burnable Poison Shims	} Also see codes 520-527	
210	Refueling	252	Radioactive Waste Treatment System
211	Fuel Handling and Storage	253	Radioactive Waste Storage
220	Auxiliary or Standby Feedwater Supply System	260	Reactor Control (excluding protection) - Inst. and Control
221	Emergency Core Cooling System High Pressure (also see code 524)	261	Reactor Protection - Inst. and Control
222	Emergency Core Cooling System Low Pressure	262	Nuclear Instrumentation
223	Core and Containment Cooling Long-term Post-Accident	263	Engineered Safeguards - Inst. and Control
224	Residual Heat Removal System	264	Auxiliary Systems - Inst. and Control
225	Component Cooling System	265	Control and Instrument Power
226	Chemical Addition System - Reactor Coolant Quality Control	270	Emergency Power System
227	Chemical Addition System - Reactor Coolant Reactivity Control	280	Core Physics Test
		290	Operator Training and License Testing (also see code 523)
		299	Miscellaneous; see codes 500-545 for additional classifications

* Codes 200-299 are to be used specifically for equipment failures, use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

GAS TURBINE**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
300	Gas Turbine, General Code; see codes 500-545 for additional classifications	319	Supercharging Fan
301	Inlet Air Ducts and Vanes	320	Interstage Gas Passages
302	Compressor	321	Expansion Joints
303	Air Filters	322	Starting Motor
304	Fuel Supply System	323	Battery and Charger System
305	Ignition System	324	Turning Gear and Motor
306	Combustion Chamber	325	Control and Instrumentation
307	Turbine (high pressure if more than one)	326	Vibration
308	Low Pressure Turbine	327	Overhaul
309	Exhaust Chamber, Hood and Vanes	*330	Engine Cleaning (carboblant, etc)
310	Intercoolers	*331	Hot End Inspection
311	Regenerators	*332	Boroscope
312	Reduction Gear	*333	Fire Protection System
313	Load Shaft and Bearings	*334	Fire in Unit
314	Compressor Shaft and Bearings for Two-shaft Machine	*335	Engine Exchange
315	Cooling and Seal Air Systems and Seals	*336	High Engine Exhaust Temperature
316	Cooling Water System	*337	Engine Vibration
317	Lube Oil System	346	Exhaust Emission (also see code 502)
318	Heat Shields	347	Noise (also see codes 540-545)
		348	Inspection (also see code 542)
		349	Miscellaneous; see codes 500- 545 for additional classification

* New Code Addition (effective 1/1/76)

** Codes 300-399 are to be used specifically for equipment failures,
use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

JET ENGINE**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
350	Jet Engine, General Code; see codes 500-545 for additional classifications	365	Lube Oil System
351	Air Inlet Vanes	366	Engine Shaft and Bearings
352	Low Pressure Compressor	367	Engine Starting System
353	High Pressure Compressor	368	Control and Instrumentation
354	Fuel System	369	Auxiliary Drive System
355	Ignition System	*370	Engine (carboblant, etc)
356	Combustors	*371	Hot-end Inspection
357	Low Temperature Turbine	*372	Boroscope
358	High Temperature Turbine	*373	Fire Protection System
359	Inlet and Exhaust Cones	*374	Fire in Unit
360	Anti-icing System	*375	Engine Exchange
361	Fuel Nozzle Cooling Air System	*376	High Engine Exhaust Temperature
362	Regenerator	*377	Engine Vibration
363	Expansion Joints	378	Overhaul
364	Shaft Seals	396	Exhaust Emission (also see code 502)
		397	Noise (also see codes 540-545)
		398	Inspection (also see code 542)
		399	Miscellaneous; see codes 500- 545 for additional classification

* New Code Addition (effective 1/1/76)

** Codes 300-399 are to be used specifically for equipment failures,
use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

FLUE GAS SCRUBBER SYSTEM*

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
400	Flue Gas Scrubber, General Code; see codes 500-545 for additional classifications	426	SO ₂ Monitor
401	Operator Failure	427	Disc Scrubber Throats
402	Stacks	428	Absorber Tower
403	ID Fans	429	Screw Conveyors
404	FD Fans	430	Bucket Elevators
405	Fan Vibration	431	Grinders & Crushers
406	Fan Blades	432	Centrifuge/Vacuum Filter
407	Reheaters, General	433	Weigh Feeders
408	Reheater, Vibration	434	Dampers
409	Reheater, Tube Leaks	435	Demister
410	Reheater Ducts	436	Demister Wash Piping Assembly
411	Thickeners	437	Agitators
412	Piping	438	Heat Tracer
413	Tubes, Corrosion, Leaking...	439	Motors
414	Spray Pumps	440	Calciners
415	Duct System, Baffles...	441	Recycle Tanks
416	Reactor Tank	442	Liquid Level Controls
417	Coupling Failure	443	Sludge Pond
418	Drain Pots	444	Test Program (also see codes 500-510)
419	Strainer Plugging	445	Instrumentation
420	Recycle Pumps	446	Inspection (also see code 502)
421	Valves, Erosion...	447	External Causes (also see codes 500-545)
422	Precipitators	448	Chemical Unavailability
423	Spray Nozzles	449	Other, Mechanical
424	Dryer	450	Other, Electrical
425	Reagent Feed Lines		

* Codes 400-450 are to be used specifically for equipment failures, use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

SAFETY AND ENVIRONMENTAL REQUIREMENTS**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
*500	Safety and Environmental Requirements, General Code		

NON-RADIOLOGICAL PROTECTION OF ENVIRONMENT**

*501	NRC Order to Investigate Possible Deficiency	*507	EPA Required Modification or Addition to Plant, e.g., Installation of Cooling Towers, Precipitators, Scrubbers, etc
*502	EPA Order to Investigate Possible Deficiency	*508	Other Required Modification or Addition to Plant, e.g., Installation of Cooling Tower Blowdown Treatment Equipment Required by State or Local Agencies
*503	Other Order to Investigate Possible Deficiency	*509	License or Operating Permit Restrictions, e.g., SO ₂ Concentration or Discharge Steam Temperature Limitation
*504	Operating Utility Decision to Investigate Possible Deficiency	*510	Intervenor Action
*505	Required Inspection or Test, e.g., Periodic Precipitator, Scrubber...etc, Tests to Demonstrate Proper Acceptable Performance		
*506	NRC Required Modification or Addition to Plant, e.g., Installation of Fish Protection Equipment or Cooling Towers, etc		

- * New Codes (effective 1/1/76)
- ** Codes 500-510 are to be used specifically for outages not directly attributed to equipment failures..

OUTAGE CAUSE CODE TABLES (continued)

NUCLEAR SAFETY PROTECTION**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
*520	NRC Order to Investigate Possible Safety Problem, e.g., BWR Pipe Crack	*524	NRC Required Modification or Addition to Plant, e.g., Design Upgrade to Meet Current Seismic Criteria or Final ECCS Acceptance Criteria
*521	Other Order to Investigate Possible Safety Problem, e.g., State or Local Legislative Action	*525	Other Required Modification or Addition to Plant, e.g., State or Local Legislation
*522	Operating Utility Decision to Investigate Possible Safety Problem, e.g., BWR Torus Design Verification	*526	ALARA (as low as reasonably achievable) Requirements, e.g., Manpower Radiation Limitations, Installation of Shielding to Reduce Background Radiation Levels
*523	Compliance with NRC Technical Specification and/or Regulatory Guides, e.g., Periodic Leak Testing of Containment Vessel - ASME Boiler and Pressure Vessel Code; Section 11	*527	Intervenor Actions

INDUSTRY SAFETY PROTECTION**

*540	Operating Utility Decision to Investigate Possible Safety Problem, e.g., Alleviation of Adverse Employee Working Conditions	*543	Required Plant Modification or Addition, e.g., Noise Abatement Equipment Installation
*541	Order to Investigate Possible Safety Problem	*544	License Operating Permit Restrictions or Regulations
*542	Required Inspection or Test, e.g., Annual Boiler Inspection	*545	Intervenor Action

* New Codes (effective 1/1/76)

** Codes 520-545 are to be used specifically for outages not directly attributed to equipment failures.

OUTAGE CAUSE CODE TABLES (continued)

EXPANDER TURBINE**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
600	Expander Turbine, General Code; see codes 500-545 for additional classifications	607	Exhaust Diffusers
601	Couplings	608	Seal Oil System and Seals
602	Shaft and Bearings	609	Inner Casing
603	Blades	610	Outer Exhaust Casing
604	Discs and Spacers	611	Lube Oil System
605	Nozzles	612	Control and Instrumentation
606	Heat Shields	613	Evactor
		699	Miscellaneous; see codes 500-545 for additional classifications

STEAM TURBINE**

600	Turbine, General Code; see codes 500-545 for additional classification	636	Seal Leaks
620	Turning Gear	637	Cylinder Outer
621	Governors	638	Cylinder Inner
622	Control, Turbine and Reheat Stop Valves	639	Dummy Ring
623	Shaft Packing	640	Gland Rings
624	Nozzles and Nozzle Blocks	641	Diaphragm, Unit and Shroud Type
625	Nozzle Bolting (first stage)	642	Piping, Steam Drain and Gland
626	Diaphragms	643	Piping, Steam Inlet and Reheat
627	Shaft	644	Cross Over or Under Piping
628	Wheels or Spindles	645	Moisture Removal Equipment (nuclear plant)
629	Buckets or Blades	646	Turbine Building Closed Cooling Water System (nuclear plant)
630	Vibration of Turbine Generator Unit	647	Steam Reheater (nuclear plant)
631	Lube Oil System & Bearings (except bearing vibration)	648	Inspection
632	Turbine Control	649	Water Induction
633	Gland Steam Controller	*650	Differential Expansion
634	Blade Fouling	699	Miscellaneous; see codes 500-545 for additional classifications
635	Shell Leaks		

* New Codes (effective 1/1/76)

** Codes 600-699 are to be used specifically for equipment failures, use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

HYDRO TURBINE**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
600	Hydro Turbine, General Code; see codes 500-545 for additional classification	675	Turbine Controls
660	Shaft Packing	676	Upper Reservoir Dam and Dikes
661	Shaft	677	Intake Channel or Flume (including trash racks)
662	Runner	678	Intake Tunnel
663	Nozzle Assembly	679	Lower Reservoir Dam and Dikes
664	Lube Oil System and Oil Lubricated Bearings	680	Auxiliary Reservoir Dam and Dikes
665	Water Lubricated Bearings	681	Penstock (including valves or headgates)
666	Vibration	682	Canal (including siphon, radial gates and spills)
667	Wicket Gate Assembly	683	Tailrace
668	Draft Tube	684	Dewatering and Rewatering Piping System
669	Spiral Case	685	Tailwater Depressing Equipment
670	Pressure Regulating Valve	686	Runner Cavitation Damage
671	Relief Valve	687	Inspections
672	Spherical Valve or Shut-off Valve	699	Miscellaneous; see codes 500- 545 for additional classifications
673	Spherical Valve or Shut-off Valve Bypass Line and Valve		
674	Governor		

GENERATOR**

700	Generator, General Code; see codes 500-545 for additional classification	708	Rotor Windings
701	Lube Oil System and Bearings	709	Rotor Collector Rings
702	Air Cooling System	710	Brush Rigging
703	Hydrogen Cooling System	711	Generator Main Leads
704	Liquid Cooling System	712	Exciter
705	Seal Oil System and Seals	713	Voltage Regulator
706	Stator Windings, Bushings Terminals	714	Generator Control
707	Stator Core Iron	715	Inspection
		716	Core Monitor Alarm
		799	Miscellaneous; see codes 500- 545 for additional classifications

** Codes 600-699 and 700-799 are to be used specifically for equipment failures, use codes 500-545 for outages attributed to other causes.

OUTAGE CAUSE CODE TABLES (continued)

CONDENSER**

<u>Code</u>	<u>Cause</u>	<u>Code</u>	<u>Cause</u>
800	Condenser, General Code; see codes 500-545 for additional classification	809	Expansion Joint
801	Cleaning	810	Inspection
802	Tube Failure	811	Off-gas System (nuclear plant)
803	Circulating Water Pumps	812	Cooling Towers
804	Condensate Pumps	813	Traveling Screens
805	Air Removal Pumps	*814	Loss of Vacuum
806	Shell	*815	High Condenser Temperature
807	Condenser Control	*816	Circulating Water System (screens, piping, etc)
808	Air Leakage	*817	Condensate Cooler
		899	Miscellaneous; see codes 500- 545 for additional classifications

OTHER**

900	Other, General Code; see codes 500-545 for additional classification	916	Maintenance Error
901	Feedwater Heaters - Leaking	918	Boiler Feed Pump Drive - Electric Motor
902	Feedwater Heaters - Dirty	919	Boiler Feed Pump Drive - Steam Turbine
903	Main Transformer	920	Boiler Feed Pump Drive - Main Shaft
904	Switchgear	921	Boiler Feed Pump Drive - Other
905	Boiler Feed Pumps, General (see 918 to 922)	922	Boiler Feed PUMP
906	Coal Conveying System	*923	Fuel Supply Limitation
907	Water Treatment System	*924	Coal Pulverizer Feeders
908	Boiler Water Condition	*925	Starting System Failure
909	Service Water Pumps	*926	Parts Unavailability
910	Computer	*927	Coal Pipes
911	Radioactivity-(nuclear-plant) ***	*928	Station Service Air
912	Cooling Water Limitation	*929	Feedwater Valves
913	Auxiliary Generator	*930	Precipitators
914	Auxiliary Transformer	999	External Cause (e.g., flood, earthquake, transmission line)
915	Operating Error		

* New Codes (effective 1/1/76)

** Codes 800-899 and 900-999 (except 923, 926 and 999) are to be used specifically for equipment failures, use codes 500-545 for outages attributed to other causes.

*** See codes 250 and 251.

APPENDIX F

COMPANIES THAT PARTICIPATED IN THE
1974 EEI EQUIPMENT AVAILABILITY PROGRAM

COMPANY

Alabama Power Co	Indiana-Kentucky Electric Corp
Appalachian Electric Power Co	Indiana & Michigan Electric Co
Arizona Public Service Co	Indianapolis Power & Light Co
Arkansas Power & Light Co	Interstate Power Co
Atlantic City Electric Co	Iowa Electric Light & Power Co
Baltimore Gas & Electric Co	Iowa-Illinois Gas & Electric Co
Boston Edison Co	Iowa Power & Light Co
Carolina Power & Light Co	Iowa Public Service Co
Central Hudson Gas & Electric Corp	Iowa Southern Utilities Co
Central Illinois Light Co	Jersey Central Power & Light Co
Central Illinois Public Service Co	Kansas City Power & Light Co
Central Louisiana Electric Co	Kansas Gas & Electric Co
Central Maine Power Co	Kentucky Power Co
Central Operating Co	Kentucky Utilities Co
Central Power & Light Co	Lake Superior District Power Co
Cincinnati Gas & Electric Co	Long Island Lighting Co
Cleveland Electric Illuminating Co	Los Angeles Department of Water & Power Co
Columbus & Southern Ohio Electric Co	Louisiana Power & Light Co
Commonwealth Edison Co	Louisville Gas & Electric Co
Connecticut Light & Power Co	Metropolitan Edison Co
Consolidated Edison Co of New York, Inc	Minneapolis Power & Light Co
Consumers Power Co	Minnkota Power Cooperative
Cool Water Generating Station	Mississippi Power & Light Co
Dairyland Power Cooperative	Mississippi Power Co
Dallas Power & Light Co	Monongahela Power Co
Dayton Power & Light Co	Montana-Dakota Utility Co
Delmarva Power & Light Co	Montana Power Co
Detroit Edison Co	Nebraska Public Power District
Duke Power Co	New England Electric System
Duquesne Light Co	New Orleans Public Service Co
Eastern Iowa Light & Power Cooperative	New York State Electric & Gas Corp
Electric Energy Inc	Niagara Mohawk Power Corp
El Paso Electric Co	Northern Indiana Public Service Co
Florida Power & Light Co	Northern States Power Co
Florida Power Corp	Northwestern Public Service Co
Georgia Power Co	Ohio Edison Co
Gulf Power Co	Ohio Power Co
Gulf States Utilities Co	Ohio Valley Electric Corp
Hartford Electric Light Co	Oklahoma Gas & Electric Co
Hawaiian Electric Co	Omaha Public Power District
Holyoke Water Power Co	Orange & Rockland Utilities Inc
Houston Lighting & Power Co	Pacific Gas & Electric Co
Idaho Power Co	Pacific Power & Light Co
Illinois Power Co	Pennsylvania Electric Co

COMPANY

Pennsylvania Power & Light Co
Philadelphia Electric Co
Portland General Electric Co
Potomac Edison Co
Potomac Electric Power Co
Public Service Co of Colorado
Public Service Co of Indiana
Public Service Co of New Hampshire
Public Service Co of New Mexico
Public Service Co of Oklahoma
Public Service Electric & Gas Co
Rochester Gas & Electric Corp
San Diego Gas & Electric Co
Sierra Pacific Power & Light Co
South Carolina Electric & Gas Co
South Carolina Generating Co
Southern California Edison Co
Southern Electric Generating Co
Southwestern Electric Power Co

Southwestern Gas & Electric Co
Tampa Electric Co
Tennessee Valley Authority
Texas Electric Service Co
Texas Power & Light Co
Toledo Edison Co
Union Electric Co
United Illuminating Co
United Power Association
United States Bureau of Reclamation
Utah Power & Light Co
Virginia Electric Power Co
West Pennsylvania Power Co
Western Massachusetts Electric Co
Wisconsin Electric Power Co
Wisconsin Power & Light Co
Wisconsin Public Service Co
Yankee Atomic Electric Co
Yuma Axis Station